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Identifying and Intervening in the Health Lifestyles of African American Preadolescents and Their Parents

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# Identifying and Intervening in the Health Lifestyles of African American Preadolescents and Their Parents

By

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B.A., Seattle Pacific University, 2006
M.A., San Jose State University, 2010

Advisor: Ellen L. Idler, Ph.D.

An abstract of
A dissertation submitted to the Faculty of the
James T. Laney School of Graduate Studies of Emory University
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Abstract

Identifying and Intervening in the Health Lifestyles of African American Preadolescents and Their Parents
By Carolyn Robbins

Persistent health disparities in the African American community are a central concern for medical sociologists and public health officials. Previous research has shown that overarching health lifestyles unite health behaviors, so intervening in health lifestyles may be an effective way to reduce health disparities, particularly early in the life course. This study uses data on African American preadolescents and their parents to identify health lifestyles, understand the mechanisms influencing the intergenerational transmission of health lifestyles, and assess the efficacy of intervening in health lifestyles. This dissertation also offers a bidimensional alternative to Cockerham's Health Lifestyles Theory, which interprets health behaviors in light of Bourdieu's *habitus.* I conducted latent class analysis and latent transition analysis on data from Parents Matter!, a set of three longitudinal parent-based HIV prevention interventions targeting 9-12-year-old African Americans in the Southeast (*N* = 1,105 dyads at baseline). Logistic regression, multinomial logistic regression, ANOVA, and pairwise comparisons were also used for supplementary analyses. Four distinct health lifestyles emerged for both preadolescents and their parents that ranged across four health domains: nutrition, physical activity, sexual behaviors/attitudes, delinquency (children), and stress (adults). Children's health lifestyles operated on health-promoting and health-compromising dimensions, although this distinction was not as clear for parents. No single variable was associated with membership in every lifestyle, but perceived norms and socioeconomic status were often significant. Baseline health lifestyles impacted preadolescents' health trajectories over the course of three years, and parents' health lifestyles were more stable than children's. Associations existed between preadolescent and parent health lifestyles. Parent-child relationship characteristics were associated with child and parent health lifestyles and may have facilitated any intergenerational transmission of health lifestyles. The interventions were linked with improvements in health behaviors across all four domains, as well as with certain health lifestyles. There was some evidence of the interventions influencing health lifestyles by interacting with aspects of the parent-child relationship. These results provide support for a *habitus*-based, multi-dimensional approach to interventions that may be effective at promoting positive health lifestyles and ultimately help to reduce health disparities in the African American community.

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## Chapter 1: Introduction

While African Americans[1] account for only 15.2% of the US population[2] (CDC 2015), they are disproportionately affected by a wide variety of health problems. Compared to members of other races[3], African Americans have the highest levels of heart disease, stroke, hypertension, diabetes, obesity, infant mortality, and colorectal cancer, among other conditions, as well as high rates of sexually transmitted infections (STIs) (CDC 2014a; CDC 2015). These health problems both stem from and contribute to socioeconomic inequalities. Income and health have a stairstep association, with 31% of adults 25 and older under the federal poverty line reporting fair or poor health, compared to only 7% of those making over four times the federal poverty line (Robert Wood Johnson Foundation 2011). The effect of race exacerbates the relationship between income and health, as the rate of fair/poor health for each income level is higher for black Americans than for whites (Robert Wood Johnson Foundation 2011). At every income level black Americans fare worse than Latinos and whites (Robert Wood Johnson Foundation 2011). The health disparities seen in the African American population thus connect with greater concerns of economic and social equality.

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[1] A note on language*:* "Black" and "African American" are often used interchangeably in general discourse, as are "Hispanic" and "Latino," and there is debate about which terms are most appropriate. That debate is outside the scope of this dissertation, so I generally follow the terms of the studies I am citing since the study language is typically linked to the wording used to collect demographic data. Conflating the two categories in

[2] This number includes individuals who identify as multiracial.

[3] Race, of course, is not a biological category but rather a social construct. While scholarly work focusing on the way race predicts a variety of outcomes can potentially lend credence to belief in the biological existence of racial categories, these categories, specifically those delineated in the U.S. Census, have significant social implications and cannot be ignored. The remainder of this dissertation should be read with the caveat that while I am focusing on the members of one particular racial category (blacks/African Americans), I do so without affirming fundamental biological distinctions.

Economic inequality is a distal cause of health disparities, but health risk behaviors serve as proximal causes (Link and Phelan 1995; Phelan et al. 2004). For instance, disparities in conditions like hypertension, diabetes, and obesity are associated with disparities in proximal risk behaviors such as poor diet and lack of exercise, while disparities in HIV and STIs are linked to differences in condom usage and the number of sexual partners individuals have. Rather than viewing each of these behaviors as separate phenomena, researchers in sociology and public health have examined how multiple health behaviors cluster together to form health *lifestyles* (e.g. Wickrama et al. 1999; Snead and Cockerham 2002; Fraga et al. 2010; Frech 2012; Pereira et al. 2015). This understanding of the interrelatedness of health behaviors has a very practical implication, as it provides a justification for developing interventions that seek to address multiple risk behaviors at once. Moreover, viewing health behaviors as lifestyles helps avoid a "blame the victim" mentality by instead looking further upstream for the ways social circumstances shape individual health choices (WHO 1986).

Social epidemiologists and sociologists offer different theoretical perspectives for explaining why these behaviors cluster together. Problem Behavior Theory (PBT) (Jessor 1991) is the most relevant theory for explaining behavioral clustering in public health, and Health Lifestyles Theory (HLT) (Cockerham 2010; Cockerham 2013) in sociology provides insight into the underlying factors leading to interrelationships between health behaviors. HLT is the most comprehensive theory, as it explains how social structure impacts our health choices both externally and internally. According to Cockerham (2010), health lifestyles are "collective patterns of health-related behavior based on choices from options available to people according to their life chances" (2010:159). His definition emphasizes

that health lifestyles are located at the intersection of an individual's choices (agency) and circumstances (structure). Recently, sociologists have begun to take a life course approach to understanding the development of health lifestyles (Mollborn et al. 2014), which is important given the influence of the "long arm of childhood" and adolescence on adult socioeconomic status and mortality (Hayward and Gorman 2004; Paavola, Vartiainen, and Haukkala 2004; Haas 2008).

While many articles in sociology and public health have studied the predictors of health behaviors (e.g. Pampel, Krueger, and Denney 2010; Elsenburg et al. 2014; Velderman et al. 2014), fewer have studied the development of health lifestyles (Frech 2012; Monshouwer et al. 2012) and the mechanisms underlying the intergenerational transmission of health lifestyles from parents to their children (Latendresse et al. 2008). To my knowledge no one has studied the intergenerational transmission of sexual behaviors, despite the importance of the subject and the fact that the transmission of sexual behaviors seems quite different than the transmission of easily observable behaviors like eating nutritious foods. Studies have, however, examined facets of the parent-child relationship that are associated with general and sexual health behaviors in preadolescents and adolescents (e.g. DiClemente et al. 2001; Cleveland et al. 2005). While sociologists have primarily focused on the theoretical aspects and underlying structures of health lifestyles, public health researchers often examine how effective interventions are at addressing multiple behaviors at once without considering the latent variables that may unite those behaviors (Kennedy and Floriani 2008; Hale, Fitzegerald-Yau, and Viner 2014; Allara et al. 2015).

In both sociology and public health, African Americans and preadolescents remain understudied populations (Miller et al. 2009b). Focusing on African American preadolescents is of tremendous importance both theoretically and pragmatically, however. When developing sociological theories about the development of health lifestyles and clustered behaviors, preadolescents should be a primary population to study given the fact that they are on the cusp of significantly increased agency, entering a stage in life that forces them to navigate decisions about their own health lifestyles rather than relying on the ones they have received from their parents (Mollborn et al. 2014). Moreover, preadolescence is a time when the number of health risk behaviors available begins to expand (e.g. smoking, drinking), while at the same time preadolescents prepare to transition from relying on parental norms to depending more heavily on peers for guidance (Mollborn et al. 2014). Pragmatically speaking, understanding preadolescents' health lifestyles allows public health workers to develop interventions that promote the positive development of health lifestyles throughout adolescence and adulthood rather than relying on interventions that attempt to correct unhealthy behaviors that have already been established and may already have negatively impacted health (Miller et al. 2009a). Promoting healthy lifestyles among African American preadolescents not only benefits them over the life course, but it also benefits society. Working to limit health disparities is a key step in addressing the vast economic and social inequalities African Americans face today.

In this dissertation I seek to address the gaps found in sociological and public health research on health lifestyles while also serving as a bridge between the two disciplines. Using data from a longitudinal parent-based HIV prevention intervention targeting 9-12-year-old African Americans in the Southeast, I aim to increase knowledge about health

lifestyles in both preadolescents and adults in three ways: reconsidering the substance of health lifestyles by incorporating sexual health behaviors, understanding the development of and mechanisms behind the intergenerational transmission of health lifestyles, and assessing the efficacy of intervening in health lifestyles for both preadolescents and their parents. Within each broad research topic I will answer three questions:

**Topic 1: Reconsidering Health Lifestyles**

*Question 1:* Do sexual risk behaviors, intentions, and attitudes share a health lifestyle in common with generally studied health behaviors like exercise, nutrition, smoking, and alcohol habits in preadolescents and adults?

*Question 2:* What social factors are associated with preadolescents' and adults' health lifestyles?

*Question 3:* Are baseline health lifestyles associated with future sexual health behaviors, such as perceived odds of having sex within the next year (for preadolescents) and number of sexual partners (for adults)?

**Topic 2: Understanding the Development and Transmission of Health Lifestyles**

*Question 4:* Do preadolescents and adults maintain one health lifestyle or does that lifestyle change over time?

*Question 5:* Does a relationship exist between parents' and children's health lifestyles over time?

*Question 6:* What role do socioeconomic status (SES), parents, peers, and other social factors play in the intergenerational transmission of health lifestyles?

**Topic 3: Intervening in Health Lifestyles**

*Question 7:* Do parent-based interventions impact the general and sexual health behaviors of children and their parents?

*Question 8:* Do parent-based interventions alter the health lifestyles of children and their parents?

*Question 9:* Do parent-based interventions affect the intergenerational transmission of health lifestyles?

In order to address these questions I will delve into the literature on health lifestyles and offer my own theory of health lifestyles in Chapters 2-4, describe my methods in Chapter 5, present my results in Chapters 6-8, and finish with a discussion of the implications of this research for sociology and public health in Chapter 9.

## Chapter 2: Health Disparities and Health Behaviors over the Life Course

The structure and reproduction of health lifestyles are complex issues spanning a wide range of academic literature, as are questions about how to intervene in health lifestyles and how health lifestyles contribute to health disparities. Any meaningful attempt to expand the conversation about health lifestyles must first be rooted in what is already known about these matters. In the next three chapters I will provide a foundation for my own research by reviewing the relevant literature in sociology and public health, covering the following topics: health disparities from a life course perspective, empirical research on how health behaviors cluster into health lifestyles over the life course, theories of health lifestyles, and health lifestyle interventions. The present chapter will focus on the first two topics.

### Viewing Health Disparities from a Life Course Perspective

Each developmental stage offers new health behaviors to choose from, and each choice becomes an opportunity to shape health for the remainder of the life course. Developmental stages impact individuals' concerns about health and motivations to live a healthier life, but often those who are most willing to think about the long-term consequences of their behaviors receive the least benefit from doing so. If "youth is wasted on the young," then so too is the opportunity to alter the trajectory of one's health. For instance, adolescents prioritize dental health and acne as chief concerns over more consequential health domains like nutrition and exercise (Millstein 1993). Young adults who are attentive to their diet are mostly worried about their dating prospects and find it

"boring" and "middle-aged" to worry about long-term outcomes like heart disease (Backett and Davison 1995:634). As adults approach middle age, however, they become more aware of their health status and recognize that they can no longer take their health for granted (Backett and Davison 1995). Unfortunately, by the time long-term health consequences surface as salient issues, an individual's health trajectory is already well-established. As the authors in one article quipped, "adult coronary disease is really a major pediatric problem" (Berenson et al. 1987:429).

This time-varying assortment of behaviors, priorities, and opportunities to intervene in health trajectories demonstrates the importance of viewing health from a life course perspective. Life course research understands that our lives are shaped by time: the historical era in which we live, the timing of life events (e.g. drinking alcohol at 15 versus drinking alcohol at 30), the generation we are a part of (i.e. peers), the generations we interact with (i.e. parents and children), and the choices we make in individual moments (Elder 1994; Short and Mollborn 2015). The life course reflects the interaction between biology and the social environment, namely the compounding effect of hardships or advantages (social accumulation), opportunities for intergenerational social mobility, and the presence or absence of buffers against hardship (social protection) (Blane 2006; DiPrete and Eirich 2006; Pavalko and Caputo 2013). A life course approach to health disparities recognizes that the impact of social factors on health is not unidirectional and limited to the present; rather, social factors and health are intertwined from birth until death.

Childhood SES and health are two key areas researchers study when examining the development and persistence of health disparities over the life course. This is because the "long arm of childhood" reaches across the years, or, as Hayward and Gorman (2004) write,

"childhood socioeconomic and family disadvantages set in motion a series of cascading socioeconomic and lifestyle events that have negative consequences for…mortality" (2004:103). For example, Haas (2008) studied the trajectory of functional health limitations in old age. Using the Health and Retirement Study to track data on individuals ages 60-70 for ten years (*N* = 10,961), he found that retrospective self-rated childhood health (birth to age 16) and childhood SES impacted both baseline functional health limitations and the rate at which individuals gained more limitations. Adult health factors (body mass index [BMI], smoking status, and number of chronic conditions) and adult SES factors (education, income, and wealth) were each significantly associated with functional limitations at baseline, but only education affected the rate of change in functional limitations. This means that the speed at which individuals lost their ability to function in old age depended more on the uncontrollable factors of their childhood than on their actions in adulthood.

Childhood health and SES have significant implications for a wide variety of adult health outcomes. Blackwell, Hayward, and Crimmins (2001) found that childhood diseases remained significant predictors of adult illnesses like cancer, cardiovascular conditions, chronic lung conditions, and rheumatism/arthritis even after controlling for childhood and adult SES. In another study (Smith et al. 1997) father's social class predicted all-cause mortality and cardiovascular-related mortality better than an individual's own social class at the start of adulthood did. Poor childhood health does not just impact adult health directly, but, particularly if it persists until children are 16, it also affects adult health indirectly by reducing adult SES (Blane 2006; Case, Fertig, and Paxson 2005), which has its own negative consequences for adult health, especially when paired with low SES in childhood (Smith et al. 1997).

Pudrovska (2014) used data from the Wisconsin Longitudinal Study (*N* = 10,317) to compare two approaches for understanding health disparities over the life course: the cumulative advantage model and the age-as-leveler model. The cumulative advantage model posits that early disparities are amplified over the life course, while the age-as-leveler model predicts that the impact of early SES on health decreases over time. Pudrovska found support for the cumulative advantage model because SES at age 18 was associated with increasing mortality over the life course (through age 72), even after controlling for adult SES and health behaviors. This trend was especially notable among women. While she also found evidence of the age-as-leveler model, this observation was an artifact of unequal selection in mortality, as individuals with lower SES at age 18 died sooner.

In addition to gender, race and age also influence how childhood health and SES impact health over the life course. In another paper on trajectories of functional health limitations using the Health and Retirement Study, Haas and Rohlfsen (2010) found that, for non-Hispanic whites, childhood health was the only childhood variable that predicted baseline and change rates of functional limitations. For non-Hispanic blacks, however, only childhood SES variables mattered, and no childhood variables were significant for Hispanics. Age, meanwhile, moderates the educational and economic gradients for health behaviors. For example, in one study (Ovrum, Gustavsen, and Rickertsen 2014) nearly all 25-year-olds received similar amounts of physical activity, but by middle age an economic gradient became increasingly apparent, with those in the top income quartile exercising more than those in the bottom quartile.

A comprehensive approach to health disparities requires that we appreciate the complex relationships between social factors throughout the life course. Of course, many elements of the social context, such as SES, are distal factors whose impact on health is mediated by proximal factors, particularly by health behaviors. Given that future behaviors are easier to change than past and present inequalities, understanding how health behaviors develop and form intergenerationally-transmitted health lifestyles is a critical step for addressing health disparities.

**How Health Behaviors Cluster into Health Lifestyles Over the Life Course**

In this section I will review the literature on how health behaviors cluster together to form health lifestyles across the life course[4]. This section is mostly atheoretical, focusing instead on empirical research in order to lay a foundation for an extended discussion about theories of health lifestyles in the next chapter. I am primarily concerned with the under-researched question of whether sexual risk behaviors "hang together" with general health lifestyles (i.e. the "SNAP" domains of smoking, nutrition, alcohol, and physical activity [Noble et al. 2015]) or whether they constitute an independent, unrelated health lifestyle. Although sexual behaviors appear substantively different from SNAP behaviors, sociodemographic characteristics that are shown to predict general health lifestyles also predict sexual risk behaviors, suggesting that the behaviors may, in fact, be related. Before

[4] A note on methods: Not all analyses of clustering in this literature are the same. Strategies for analyzing the relationships between behaviors include creating a summative index, determining covariances, running logistic regressions, developing growth models (i.e. determining trajectories), and performing factor analysis, latent class analysis, and/or cluster analysis. Each of these strategies has strengths and weaknesses, and I will address some of them in the methods chapter. Briefly, however, studies that use factor analysis, latent class analysis, cluster analysis, and/or growth models are preferable from a theoretical perspective because they allow researchers to ascertain the underlying dimensions uniting behaviors. However, much can still be learned from studies that use other methods, so I include these in my review here as well.

reviewing the literature on how health behaviors across multiple domains cluster together, I will first discuss the life course aspect of health behaviors.

*How the Life Course Impacts Health Behaviors and Health Lifestyles*

Studying the health lifestyles of preschoolers, Mollborn et al. (2014) emphasize the need to take a life course perspective and think *developmentally* about health lifestyles. A developmental approach to health lifestyles understands that the balance between structure and agency, the potential range of health behaviors, and the social significance of health behaviors changes over time. I will spend the rest of this sub-section describing health lifestyles at each major life stage.

CHILDHOOD

The developmental approach is particularly important for children and teenagers, whose agency is limited not just by structures in society, but also by the added structure their families provide. As Mollborn et al. write, "Children's health lifestyles are a mixture of parents' and children's agency, structural constraints, and identities, with parents' influence waning and children's influence growing with age" (2014:388). The authors developed the terms "received lifestyles" to describe the health lifestyles children receive from their parents and "achieved lifestyles" to describe the lifestyles children achieve on their own.

According to Mollborn et al., health lifestyles are transmitted from parents to their children in three ways: 1) through parents' behaviors directly impacting children (e.g. when parents who smoke expose their children to second-hand smoke), 2) through choices that affect both parents and their children (e.g. installing a smoke detector), and 3) through

parents making decisions that only affect their children (e.g. purchasing the safest car seat on the market). The authors argue that early childhood is a critical stage to research since patterns set during the transition to school have marked consequences on learning, behavior, and health throughout the life course (Hayward and Gorman 2004; Haas 2008). Young children have some amount of agency regarding health decisions (e.g. they can choose not to eat the broccoli their parents feed them), but for the most part their health choices are highly structured by the choices their parents make. Although Mollborn et al. did important theoretical work conceptualizing the differences between adults' and children's health lifestyles, health lifestyles research on young children is limited by young children's lack of agency and the small range of possible high-risk health behaviors accessible to them.

## PREADOLESCENCE AND ADOLESCENCE

It is during preadolescence and adolescence that a child's health behavior options rapidly expand to include risk behaviors like smoking, drinking, using drugs and having unprotected sex. Although some may doubt that preadolescents engage in such behaviors, especially sexual ones, an article (Miller 2012) on sexual initiation in African American preadolescents (which uses the data I am analyzing in this dissertation) found that 20% of 12-year-olds anticipated having sex in the next year, and 8% of 10-year-olds had consensually touched or been touched by a boyfriend/girlfriend under their clothes. Even children as young as 9 reported having had consensual oral sex (one respondent) or vaginal sex (three respondents) ($N$ = 1,096). In national data from the 2013 Youth Risk Behavior Survey, 5.6% of respondents reported having sexual intercourse before age 13 (CDC 2014b).

Estimates by race and gender varied widely. White females (2.1%), Hispanic females (3.8%), and white males (4.4%) were least likely to report an early sexual debut, while African American females (4.9%), Hispanic males (9.2%), and African American males (24.0%) were the most likely to report early sexual intercourse (CDC 2014b). Although these statistics are self-reported and therefore likely subject to response bias, one clear fact emerges: children who appear to be too young to engage in sexual activity may already be beginning—or past—the process of sexual initiation. Moreover, as the behavior becomes normative among peers, the likelihood of engaging in sexual behaviors increases for the as yet uninitiated, regardless of parental monitoring (Rai et al. 2003).

Due to the high-risk nature of the new realm of health behaviors preadolescents and adolescents encounter, the stakes of engaging in these behaviors, even just once, increase significantly. The odds of being harmed are far higher for a teen who exercises his agency by having unprotected sex than they are for the preschooler who exercises her agency by not wearing a helmet when riding her tricycle in the backyard. Furthermore, the structure and influences on health lifestyles change dramatically for preadolescents and adolescents. Families begin to balance the benefits of sheltering their children in family-based structure with the need to reduce that structure so that preadolescents can exercise the autonomy they will crave as adolescents. Preadolescents and adolescents are also embarking on an entirely new health domain that for the most part has been neither previously modeled nor determined by parents (as it was not yet developmentally relevant): sexual risk behaviors. The incorporation of sexual behaviors into health lifestyles is therefore especially important for understanding the transition from received to achieved health lifestyles in tweens and teens.

Despite the fact that sexual behaviors first become relevant to children in preadolescence and early adolescence, little is known about the development of sexual behaviors and the process of sexual initiation in these young age groups. Given that the study of sexual behaviors in preadolescents and early adolescents is a critical part of this dissertation, it will be helpful to first take a brief detour into the nature of preadolescent and early adolescent sexuality. Using the data I will be analyzing in this dissertation, Butler et al. (2006) applied psychology's Transtheoretical Model (TTM) (Prochaska and Velicer 1997) to preadolescent sexual development. TTM views behavior change as a process by which individuals move through five stages: precontemplation, contemplation, preparation, action, and maintenance. This progression is not necessarily a linear one, however, and prior research has demonstrated that precontemplation and maintenance phases last the longest, with the others occurring much more rapidly. The authors expanded on the limited data about how this process applies to sexual initiation by examining the existence of these stages in preadolescents as well as the pattern of preadolescents' progression through them. Precontemplators consisted of two groups of preteens: those for whom sex was not a self-relevant thought (e.g. they did not know what sex was) and those for whom it was self-relevant (i.e. they had thought about sex but were not planning on having sex within the next year). The contemplation stage included those respondents who intended to have sex but had not made any attempts to do so (i.e. they had not engaged in any "advanced" pre-coital behaviors, like consensual touching under the clothing). On the other hand, those who intended to have sex *and* had engaged in advanced pre-coital behaviors were in the preparation stage. Finally, preteens who had already had (consensual) intercourse were in the action stage (the study did not address the maintenance stage).

As might be expected from a sample of 9-12-year-olds, the majority of respondents were in the precontemplation stage (90%). There was some movement from Time 1 to Time 2, as 8% of the sample advanced to a later stage and 5% returned to an earlier stage (suggesting a cyclical pattern in sexual initiation rather than a linear one). Older preadolescents were more likely to be in an advanced stage than younger students were, and older students were also more likely to progress to advanced stages (for instance, only 1.9% of 9-year-olds progressed, versus 13.5% of 12-year-olds). This provides support for the stability of the precontemplation stage and the comparative instability of intermediate stages. Gender played a role as well, as boys had a faster rate of progression than girls did.

Miller et al. (2012) revisited the ideas in Butler et al. (2006), although the authors used the new terminology of "Ready, Set, Go" to describe preadolescents' sexual thoughts, intentions, and behaviors rather than the precontemplation, contemplation, preparation, and action stages of TTM. "Ready" included those respondents who would have been classified as self-relevant precontemplators in the Butler article. "Set" incorporated respondents in the contemplation and preparation stages, while "Go" indicated those who were in the action stage, having participated in consensual oral sex or vaginal intercourse. Performing bivariate analysis on baseline data to look at age group trends, the authors found 9-year-olds were not too young to be in the "Ready" category and participate in an intervention about sex, as 46% felt they were ready to learn about sex, 14% had thought about sex, and 51% had dated. These numbers increased at older ages, with 41% of 12-year-olds reporting having thought about sex. Age trends were significant for every variable in the "Ready" category, aside from thinking about sex, as well as in the "Set" category ($p <$ .001-.05).

The research from Butler et al. (2006) and Miller et al. (2012) shows that African American preadolescents are already embarking on the path to sexual initiation. Additional research focuses on how these early paths determine future behaviors. In a nationally representative longitudinal study of respondents ages 14-32 (*N* = 11,963), Vasilenko and Lanza (2014) found that the percentage of individuals with multiple sexual partners in the previous year increased steadily throughout adolescence before peaking at age 20, with roughly 30% of respondents having multiple sexual partners. Vasilenko and Lanza's study was left-censored at age 14, but the research of Butler et al. (2006) and Miller et al. (2012) demonstrates that the true start of an individual's trajectory of multiple partners begins in preadolescence. Fergus, Zimmerman, and Caldwell (2007) observed a similar trajectory in their research on sexual risk behavior among 14-22-year-olds (*N* = 847), with participation in risk behaviors peaking around age 20. The authors also identified different trajectories for African American and white males and females. African American males and females initially had higher rates of sexual risk during their first three years in high school, while white males and females had the highest rates after high school. Combined, these four articles further reaffirm the need to take sexual behaviors in preadolescents seriously, especially among African Americans. They also illustrate the importance of intervening in the development of health lifestyles early in the life course before behavior patterns have a chance to solidify and lead to harmful outcomes.

## ADULTHOOD

If health lifestyles in childhood are marked by limited agency and health lifestyles in preadolescence/adolescence are marked by increased levels of agency and a new range of

(typically high-risk) health behaviors, then key distinguishing features of health lifestyles in adulthood are the addition of preventive health behaviors and a shift in the social significance of previous health behaviors. Although many prevention behaviors, like brushing one's teeth, are important at every life stage, other preventive behaviors emerge further along the life course. In a woman's life, for example, young women are told to schedule pap smears, middle-aged women are advised to receive regular mammograms, and older women are encouraged to receive pneumonia vaccines to protect their health (National Women's Health Resource Center 2016). At the same time, the social significance of previous health behaviors begins to shift as well (Short and Mollborn 2015). For instance, adolescents who drink, smoke, and use marijuana are labeled as "delinquents" by society, but in states that have legalized marijuana adults who engage in those behaviors are law-abiding citizens. While smoking and excessive drinking remain high-risk health behaviors for adults, they lack the same element of *social* risk that those same behaviors possess for preadolescents and adolescents (Jessor 1991).

Agency seems to be as complete as possible in adulthood, but to some extent adults restrict their own agency by re-submerging themselves in a family structure. Although adults have more agency in determining family health lifestyles than their children do (Mollborn et al. 2014), children can limit parents' health behavior agency, sometimes directly (e.g. the sleep-deprived father of a colicky newborn or a parent whose child explicitly petitions her to quit smoking) (Fägerskiöld 2008) but mostly, I suspect, indirectly through parents' desires to be good role models and provide their children with the healthiest lives possible (e.g. parents who quit smoking so that their children do not pick up the habit or parents who learn about how harmful excess sugar intake is for children and

significantly reduce sugar levels in their own diets as well) (Rosen et al. 2012). Studying how the life course alters how health behaviors cluster into health lifestyles, as well as examining how these behaviors and lifestyles are transmitted from parents to their children, ought to be a focus of sociological and public health research.

*SNAP (Smoking, Nutrition, Alcohol, and Physical Activity) Behaviors*

A large portion of the research on health behavior clusters focuses on general or "SNAP" behaviors, so I will describe some of the noteworthy findings on clustering in general health behaviors before moving on to discussing research on how these SNAP behaviors cluster with sexual behaviors. Bear in mind that the variables included in each study vary widely, so conclusions can only be made about whether behaviors hang together to form health lifestyles rather than about the particular composition of clusters. A recent study (Mollborn et al. 2014) used the Early Childhood Longitudinal Study-Birth Cohort ($N \approx$ 6,450) to analyze early childhood health lifestyles. Their study is noteworthy because it was the first to extend theories of health lifestyles beyond adolescents and adults. After using latent class analysis to look for clustering patterns in the domains of diet, sleep, secondhand smoke exposure, safety, and violence, the authors found evidence of five distinct lifestyles: consistently positive, middle of the road, food insecurity/violence/smoking, nutrition/sleep problems, and safety problems.

Research by Seghers and Rutten (2010) is an example of a typical article on the clustering of health behaviors among preadolescents and adolescents. The authors studied exercise, sedentary, and dietary behaviors in 317 Flemish 11-12-year-olds. Using *k*-means clustering to find relationships between five variables (leisure-time physical activity, hours

spent doing homework, screen-based media use, health food index, and risk-related food index), the authors found evidence of four lifestyle clusters: sporty media-oriented mixed eaters, academic healthy eaters, inactive healthy eaters, and inactive media-oriented unhealthy eaters.

Pereira et al. (2015) conducted a similar study, but they found fewer lifestyle clusters. The authors collected data on 686 Portuguese 9- and 10-year-olds, seeking to study behavior clusters in the domains of physical activity, sleep, fruit/vegetable intake, sugary drink intake, and screen time. Only 0.2% of children had no risk behaviors. Using latent class analysis, the authors found evidence for two latent classes: sedentary/poorer diet quality and insufficiently active/better diet quality. Fraga et al. (2010) also researched clustering behaviors among Portuguese children. The authors looked for clusters of health behaviors in the domains of tobacco use, alcohol use, exercise, nutrition, and sleep among 13-year-olds (*N* = 2,160). After hierarchical cluster analysis, three distinct clusters emerged: respondents who did not use substances and had healthy dietary/sleep patterns, those who used substances but still practiced healthy dietary/sleep behaviors, and those who used substances and had poor dietary/sleep patterns. These findings are particularly interesting because although they indicate "SNAP" behaviors cluster together (as in the case of the first and third categories), smoking/alcohol "SA" and nutrition/physical activity "NP" behaviors can also cluster together separately (as in the second category). Indeed this trend will be seen again and again in the literature on adults as well (Noble 2015). I suspect that sexual behaviors operate in much the same way—having a tight relationship with one another (as smoking and alcohol use do with one another), but also corresponding with traditional SNAP behaviors, although perhaps with "SA" and "NP" behaviors in different ways.

Terre et al. (1990) captured the way the content of health lifestyles changes based on a child's developmental category. The authors used data from a study of 1,092 children enrolled in public middle and high schools, ranging in age from 11-18. Performing principal component factor analysis on a variety of variables within the domains of exercise, nutrition, "Type A" personality characteristics, alcohol use, and tobacco use, Terre et al. arrived at five factors for each developmental category (age 11, ages 12-13, ages 14-15, ages 16-18). Although the exact categories were not consistent across all developmental categories, five general factors emerged for the overall sample: smoking, alcohol, unhealthy breakfast foods, sedentary behaviors, and being "Type A". Even when factors persisted across developmental categories, the variables that loaded onto those factors differed. For instance, alcohol was a separate factor in each developmental category, but for 11-year-olds the number of drinks consumed in a row loaded separately onto another factor, substance use, along with items like using chewing tobacco and being loyal to a particular cigarette brand. For older students, however, the substance use category narrowed to smoking-related behaviors only, while the alcohol factor captured extra variables like disliking physical activity (12-13-year-olds) and fighting (14-15- and 16-18-year-olds). Additionally, parental smoking only loaded onto one factor (smoking) for 12-13-year-olds, perhaps suggesting a particular susceptibility to parental influence at that age.

Monshouwer et al. (2012) published an especially interesting study that documented the way preadolescents transitioned into high-risk or low-risk lifestyles as adolescents. The authors analyzed data on Dutch children from the TRacking Adolescents' Individual Lives Survey (TRAILS) ($N$ = 2,230). A longitudinal study, respondents entered TRAILS as 11-year-olds with follow-ups around ages 14 and 16. The authors used

longitudinal transition analysis (a longitudinal version of latent class analysis) to measure the relationships between alcohol, tobacco, marijuana, and externalized behavior problems (e.g. stealing from home or getting into fights) over time. They arrived at a two-class model with a high-risk behavior pattern and a low-risk behavior pattern. Monshouwer et al. then examined how respondents transitioned throughout the two patterns from baseline to the third wave. They found 39.5% of the sample remained in low-risk patterns and 16.2% continued with a high-risk pattern. 41.8% transitioned from a low-risk pattern to a high-risk pattern, while only 2.5% transitioned from a high-risk pattern to a low-risk one.

Research focusing solely on adolescents shows similar clustering relationships between general health behaviors. Many studies only addressed SNAP behaviors (Mistry 2009; Karvonen 2000; Baer-Wilson and Nietert 2002; Kwon and Wickrama 2014; Paulsson-Do et al. 2014), but others included sleeping habits (Wickrama et al. 1999; Frech 2012), dental hygiene (Alzahrani et al. 2014), self-harm (MacArthur et al. 2010), fighting (Alzahrani et al. 2014), and sedentary behaviors (Boone-Heinonen, Gordon-Larsen, and Adair 2008; Marques et al. 2013; de la Haye et al. 2014). An article by Frech (2012) is worth discussing in more detail, because she studied the health behavior trajectories of adolescents as they matured into young adults (ages 13-24). Using three waves of the National Longitudinal Study of Adolescent Health ($N$ = 10,775), Frech analyzed the data with multilevel growth models. She found that adolescents engaged in fewer healthy behaviors (in this case SNAP and sleeping behaviors, although this cluster of behaviors was operationalized as an index rather than as a factor) as they aged. The average 13-year-old participated in 5.37 healthy behaviors (out of six possible behaviors), but that number declined by .16 each year ($p <$ .001), leaving the average 24-year-old participating in only 3.80 healthy behaviors. This

decline was even larger after controlling for a substantial list of social and sociodemographic covariates, with an intercept of 5.33 behaviors and slope of -.21 ($p$ <. 001). This research illustrates how important it is to take a life course approach to understanding the development of lifestyles—as well as why interventions that target the development of preadolescent and adolescent health lifestyles are so important.

A comprehensive review of additional research finds similar patterns for the clustering of SNAP health behaviors as individuals progress through adolescence (Busch et al. 2013; and Sanchez et al. 2013), early adulthood (Burke et al. 1997; Burke et al. 2000; Wang et al. 2009; Stefansdottir and Vilhjalmsson 2007; Kincheloe 2012; Raj, Singh Sengam, Singh 2013), and adulthood (Buttery, Mensink, and Busch 2014; Ding et al. 2014; Griffin et al. 2014; and Noble 2015)[5]. New health behaviors for analysis emerge over the life course, such as drinking and driving, running a red light, and dating violence during adolescence (van Nieuwenhuijzen et al. 2009; Sullivan, Childs, and O'Connell 2010; Shorey et al. 2015), discussing health concerns with medical providers in young adulthood (Wang et al. 2009), and time spent sitting and being screened for colorectal and prostate/breast cancer during adulthood (Ding et al. 2014; Griffin et al. 2014).

*SA (Smoking and Alcohol) and Sexual Behaviors*

As shown in the previous section, many articles address the clustering of SNAP behaviors. Articles that incorporate sexual behaviors are more rare, however, and often limit their focus to how those behaviors intersect with smoking, substance use, and/or

[5] See also Patterson, Haines, and Popkin 1994; Dean, Colomer, and Pérez-Hoyos 1995; Berrigan et al. 2003; Cockerham 2007; de Vries et al. 2008; Krueger, Bhaloo, and Vaillancourt Rosenau 2009; Nelson et al. 2009; Baruth et al. 2011; Lippke et al. 2012; and Pruchno and Wilson-Genderson 2012.

alcohol (a cluster dubbed “la dolce vita” by Kannas [1981]). Wiefferink et al. (2006) wrote a systematic review of articles published from 1995-2003 on the determinants and clustering of health-related behaviors in preadolescents and adolescents (ages 10-18). None of the studies in the systematic review examined NP behaviors and sexual behaviors at the same time. Of the 116 articles included in the review, only 20 studied multiple behaviors simultaneously, and only a handful of these included sexual health behaviors (Blum et al 2000; Greene et al. 2000; McGee and Williams 2000; Beal, Ausiello, and Perrin 2001; DiClemente et al. 2001; La Greca, Prinstein, and Fetter 2001; Topolski et al. 2001; Brooks et al. 2002; Maxwell 2002; Oman et al. 2002; Cooper et al. 2003). The authors cited two additional articles (Flisher et al. 2000; Zweig, Phillips, and Duberstein Lindberg 2002) that used indices or risk profiles to study the interrelationships between general and sexual behaviors (a third included sexual health variables but did not examine clustering patterns). Flisher et al. (2000) studied 1,285 9-17-year-olds and learned that cigarette smoking, marijuana use, alcohol use, violence, and having had sex at least once were all positively associated. Zweig et al. (2002), meanwhile, performed principal component factor analysis on a nationally representative sample of high school students (*N* = 12,578), identifying four profiles for assessing participation in risk behaviors that were distinct for males and females. The four female profiles were low risk (but sexually active), low risk (with higher rates of suicidal ideation and fighting), moderate risk (sexually active and using illegal substances), and high risk (engaging in all risk behaviors). For males the four profiles were low risk (avoiding risk behaviors), moderate risk (sexually active, using alcohol, binge drinking, and smoking), moderate risk (higher levels of suicidal ideation and marijuana use), and high risk (but with lower rates of suicidal ideation).

Forehand et al. (2005), using the same dataset as this dissertation, examined whether any of five risk behaviors (getting into trouble at home or school, fighting, drinking alcohol, and using marijuana) and one adaptive behavior (doing well in school) were associated with preadolescent sexual intentions (namely, preadolescent report of a 50% or greater likelihood of engaging in sexual intercourse during the next year). Performing logistic regression on baseline data of parent and child reports of behaviors and child reports of sexual intentions, the authors found that all of the behaviors were associated with sexual intentions (with the exception of marijuana use, which was dropped from the study due to a small *N*). Preteens who reported fighting, getting into trouble with the police, or drinking alcohol were 44%, 75%, and over twice as likely, respectively, to anticipate having sex in the next year ($p < .01$-$.05$). Those who reported doing well in school, on the other hand, were 43% less likely to intend to have sex ($p < .05$). Children whose parents reported them getting into trouble at home were over twice as likely to intend to have sex ($p < .01$), while those whose parents reported that their children were doing well in school were half as likely to intend to have sex ($p < .01$). The authors noted that these findings suggest both overt (e.g. fights) and covert (e.g. alcohol use) behaviors are associated with sexual intentions.

Sullivan, Childs, and O'Connell (2010) studied patterns of SA, delinquency, and sexual behaviors in high school students in the UK ($N = 2,549$). Using latent class analysis, they found evidence of four classes: non-sexually active/high-risk behavior youth (5%), abstainers (36%), experimenters (36%), and high-/diverse-risk behavior youth (22%). Of these classes, only members of the latter two had high probabilities of having multiple sexual partners in the previous three months, not using a condom, and, in the case of the

fourth class, having sex while intoxicated. One surprising finding about the make-up of these classes is that, while sexual behaviors usually clustered together with SA and delinquency behaviors, a small segment of high schoolers engaged in high-risk activities without having sex. It would be worthwhile to see what sociodemographic and/or family and peer traits predicted membership in that category, as well as whether members eventually transitioned to one of the higher sexual risk categories.

Additional research finds similar patterns in the clustering of "S" and "A" behaviors and sexual behaviors in preadolescence (Wang et al. 2014b) and adolescence (Brookmeyer and Henrich 2009; van Nieuwenhuijzen et al. 2009; Campo-Arias, Ceballo, and Herazo 2010; Ritchwood 2012; Wang et al. 2014b; Shorey et al. 2015). I was not able to locate any articles on adults that fell into this category, since research on adults either focused exclusively on SNAP behaviors or combined SNAP behaviors with sexual behaviors. From the available research it is possible to conclude that there is a strong, but not inevitable, relationship between risk behaviors (e.g. smoking and drinking alcohol) and sexual behaviors.

*SNAP (Smoking, Nutrition, Alcohol, and Physical Activity) and Sexual Behaviors*

While the articles in the previous section show evidence of a relationship between sexual behaviors, smoking, substance use, and/or alcohol (i.e. "la dolce vita"), fewer studies have examined how sexual risk behaviors link with health-promoting behaviors like proper nutrition and sufficient exercise. To my knowledge, only five such articles have been published and they only examine two stages in the life course: adolescence (Pate et al. 1996; Nelson and Gordon-Larsen 2006; van Nieuwenhuijzen et al. 2009), and young

adulthood (18-40) (Laska et al. 2009; van Nieuwenhuijzen et al. 2009; Reijneveld et al. 2012). Due to the limited number of articles and their direct applicability to my dissertation, I will discuss each of them in turn.

Some of the SNAP and sexual behaviors literature for adolescents does not detect clusters or underlying factors, but nonetheless the findings still have implications for the study of multiple risk behaviors. In an article using the 1990 Youth Risk Behavior Survey (*N* =4,293), Pate et al. (1996) found that high school students who had one or more sexual partners in the previous three months were 27% more likely to be classified as "low active" (meaning they had not had any vigorous exercise and fewer than two days of light exercise in the previous two weeks) (CI: 1.06-1.52). In a related study, Nelson and Gordon-Larsen (2006) used the National Longitudinal Study of Adolescent Health (*N* = 11,957) to study how clusters of physical activity and sedentary behavior affected SA risk behaviors among 7-12 graders, as well as having had sexual intercourse and not using birth control during the last sexual encounter. The authors used Poisson regression to calculate average risk ratios of risk behaviors based on cluster category. Nelson and Gordon-Larsen found that, compared to a watching TV/videos and gaming cluster, those who were skaters and gamers had lower rates of having had sexual intercourse (.86, CI:.78-.94) and not using birth control during their last sexual encounter (.74, CI:.59-.94).

In a nationally representative sample of the Dutch population, ages 12-40 (*N* = 4,395), van Nieuwenhuijzen et al. (2009) analyzed behaviors across the SNAP domains, as well as dangerous driving, delinquency, sleep, and condom use. Although the study included 12-15-year-olds, because the condom use variable was not included in this population I will only discuss the results for the late adolescent (16-18) and adult (19-24, 25-

40) categories. The authors were unable to find a factor model that properly fitted their entire sample, but they were able to separately fit smaller categories. This fact illustrates the importance of analyzing the clustering of health behaviors from a life course perspective. Late adolescents had three lifestyle factors: health (nutrition and exercise), delinquency (aggression, drug use, smoking, sleeping, and, curiously, eating breakfast), and alcohol (alcohol, traffic violations, condom use, and, another surprise, vigorous exercise). The authors noted that alcohol likely was not part of the "delinquency" category because purchasing alcohol is legal at age 16 in the Netherlands. Vigorous exercise was the only health-promoting behavior associated with unsafe sex, with both behaviors loading positively onto the alcohol factor (.26 and .42, respectively), although vigorous exercise was the weakest variable in the factor. Adults from both age groups (19-24 and 25-40) shared the same lifestyle factors with late adolescents, but different behaviors loaded onto the adult factors: health (nutrition, smoking, sleep, and exercise behaviors), delinquency (aggression, drug use, and traffic violations), and alcohol (alcohol use and condom use). Most notably, smoking and sleep were added to the health-promoting lifestyle, while exercise no longer loaded with unsafe sex onto the alcohol health lifestyle. The authors observed that there were also differences in factor loadings by gender, namely males had higher mean delinquency scores. It is interesting that the same model fit both 19-24-year-olds and 25-40-year-olds, given the marked differences those phases of life often represent. However, this may be explained by the lack of preventive behaviors in the model, which, as I argued earlier, might be more important lifestyle characteristics for older adults.

Also studying the Dutch, Reijneveld et al. (2012) compared the health lifestyles of native Dutch citizens, Dutch immigrants from non-industrialized countries, and Dutch

immigrants from former Dutch colonies (*N* = 2,982, ages 19-40). The authors included variables from the SNAP domains as well as questions on condom use, sleep, delinquency, and dangerous traffic behavior. Using factor analysis, they identified different lifestyles for each population. Health behaviors for Dutch natives clustered into three factors: health enhancing (eating breakfast, smoking, sleeping, exercising, and eating fruits and vegetables), rule-breaking behavior (delinquency, drug use, dangerous traffic behavior), and alcohol use (alcohol and condom use). Both immigrant populations, on the other hand, only had two health lifestyles: alcohol and rule-breaking behavior. Condom use did not load onto the alcohol factor for Dutch immigrants from former Dutch colonies, but it did load onto the alcohol lifestyle for Dutch immigrants from non-industrialized countries, along with variables concerning alcohol use, heavy exercise, and sleep. This article shows that sexual behaviors like condom use pair with alcohol use, but not with health-promoting behaviors. The authors should be commended for comparing health lifestyles across different social groups, but perhaps they may have found differences between age groups had they conducted separate analyses on the 19-24 and 25-40 age groups as van Nieuwenhuijzen et a. (2009) did.

Conducting research on undergraduate Minnesotans (*N* = 2,026), Laska et al. (2009) used latent class analysis to assess patterns across SNAP behaviors, as well as unhealthy weight control behaviors, stress management, sleep, drunk driving, and being intoxicated the last time respondents had oral, vaginal, or anal intercourse. The authors evaluated males and females separately, finding evidence of four latent classes for each gender. Female classes included poor lifestyle/low risk (unhealthy NP behaviors but few SA and sexual risk behaviors), higher risk (high probability of smoking, binge drinking, having sex

while intoxicated, and drunk driving, but also less sleep and lower levels of fruit and vegetable intake), moderate lifestyle/low risk (moderately healthy NP behaviors and low probability of SA and sexual risk behaviors), and health conscious (unhealthy weight control behaviors, but active with good nutrition and moderate to low probability of SA and sexual risk behaviors). These classes made up roughly 40%, 24%, 20%, and 15% of the sample, respectively. For males, the classes were poor lifestyle/low risk (9%), higher risk (34%), moderate lifestyle/low risk (51%), and "classic jocks" (6%). The first three classes were similar to those for females, but the "classic jocks" category consisted of a higher probability of physical activity, binge drinking, intoxicated sex, drunk driving, poor sleep, and unhealthy weight control behaviors. This article illustrates that SNAP health behaviors and sexual behaviors relate to each other in different ways, depending on the individual, but the authors did not analyze which sociodemographic characteristics, aside from gender, predicted membership in the classes.

*Bidimensional Health Lifestyles*

Many of the studies discussed so far found evidence of three, four, five, or even more factors underlying SNAP and/or sexual behaviors, but some researchers argue that health behaviors are essentially bidimensional, even if additional factors improve how models fit (Jessor 1991; Elliott 1993; Aarø, Laberg, and Wold 1995; Lippke, Nigg, and Maddock 2012). According to this perspective, one dimension contains addictive/high-risk/health-compromising behaviors and the other includes health-affirming behaviors. This duality is reminiscent of Keyes and Michalec's research (2010) on the bidimensionality of mental health and illness, where mental health is not merely the absence of mental illness

but is its own entity consisting of a unique set of behaviors and predictors that promote mental health. A similar dualism can be seen in public health's twin priorities of promoting health and preventing disease (Tengland 2010). Studies that find evidence of three to four factors lend credence to a bidimensional approach (e.g. Dodd et al. 2010; Fraga et al. 2010; Glorioso and Pisati 2014; Noble et al. 2015), because these factors typically describe categories of high health risk (poor performers on both dimensions), low health risk (excelling in both dimensions), and moderate risk categories (consisting of people who either abstain from high-risk behaviors but do not pursue health-promoting behaviors or those who engage in risk behaviors but also participate in health-promoting behaviors).

Jenkins, DiLalla, and Dzara (2012) note a similar bidimensional pattern with risky sexual behaviors in particular, as university students in their study actively pursued health-promoting behaviors without reducing their participation in risky sexual behaviors. Wiefferink et al. (2006) argue that there is more evidence for a high-risk factor among multiple domains of health behaviors such as smoking, alcohol use, and excess fat intake than there is for a health-promoting factor that encompasses behaviors from a variety of health domains, such as safe sex, good nutrition, and adequate exercise. Flay (2002), Jessor (1991), and Cockerham (2013), on the other hand, make the case that all health behaviors, both those that increase risk and those that promote health, are related due to the broader influence of society and culture. I will return to the social influences on behavior in the next chapter when addressing public health and sociological theories that explain the clustering of health behaviors. The nature of the underlying relationship between behavior clusters remains an open question, emphasizing the importance of testing whether SNAP behaviors

cohere with sexual behaviors in order to gain further insight into the unseen influences that shape our lives.

There is no simple solution, of course, as the composition of these behaviors and clusters changes over the life span—and this fact may help explain why researchers have had difficulty arriving at a single set of health lifestyles. For instance, Vasilenko and Lanza (2014) found that marijuana use and cigarette use became decreasingly effective at predicting the number of sexual partners individuals had, with teenagers who used marijuana or smoked being anywhere from three to nine times more likely to have multiple sexual partners (depending on age and gender). The odds ratios were less impressive (although still greater than one) for those in their early to mid-twenties, who ranged from being about two to four times more likely to have multiple sexual partners, but by the late twenties and early thirties this trend became more mixed (although there was an uptick in the relationship between marijuana use, cigarette use, and multiple sexual partners for women in their early thirties). As described earlier, Van Nieuwenhuijzen et al. (2009) were unable to find a factor model that properly fit their entire sample (with an age range of 12-40), but they were able to separately fit SNAP plus sexual behaviors models for individual age groups (16-18 and 19-40), and a SNAP model for 12-15-year-olds (since the authors dropped sexual behaviors from the model, deeming them, along with running a red light, not relevant for that age group).

In general, the body of literature on the clustering of health behaviors shows a strong need for more research in three areas: 1) how health behaviors cluster in preadolescents, 2) the relationship between SNAP and sexual behaviors for all ages, but particularly preadolescents, and 3) the development of these clusters over the life course.

In this dissertation I intend to expand knowledge in each of these areas with the ultimate aim of contributing to the reduction of health disparities over the life course.

## Chapter 3: Theorizing Health Lifestyles

The previous chapter showed that research in the fields of sociology and public health have consistently demonstrated the internal relationships among health behaviors in a wide variety of domains. Actually *explaining* why these patterns occur is more difficult. Sociologists and public health researchers offer different ways of understanding why health behaviors cluster together across multiple domains. I will begin by addressing a theory from public health, Problem Behavior Theory (PBT), before moving to sociology's Health Lifestyles Theory (HLT). Although PBT provides rich insights into the patterning of health behaviors, I will focus on HLT because it is the most well-developed of the two when explaining how health lifestyles "get inside of" us through the *habitus,* as well as how health lifestyles are reproduced from generation to generation. I will also present a revised version of Cockerham's theory that takes the bidimensionality of health lifestyles into account.

### Problem Behavior Theory

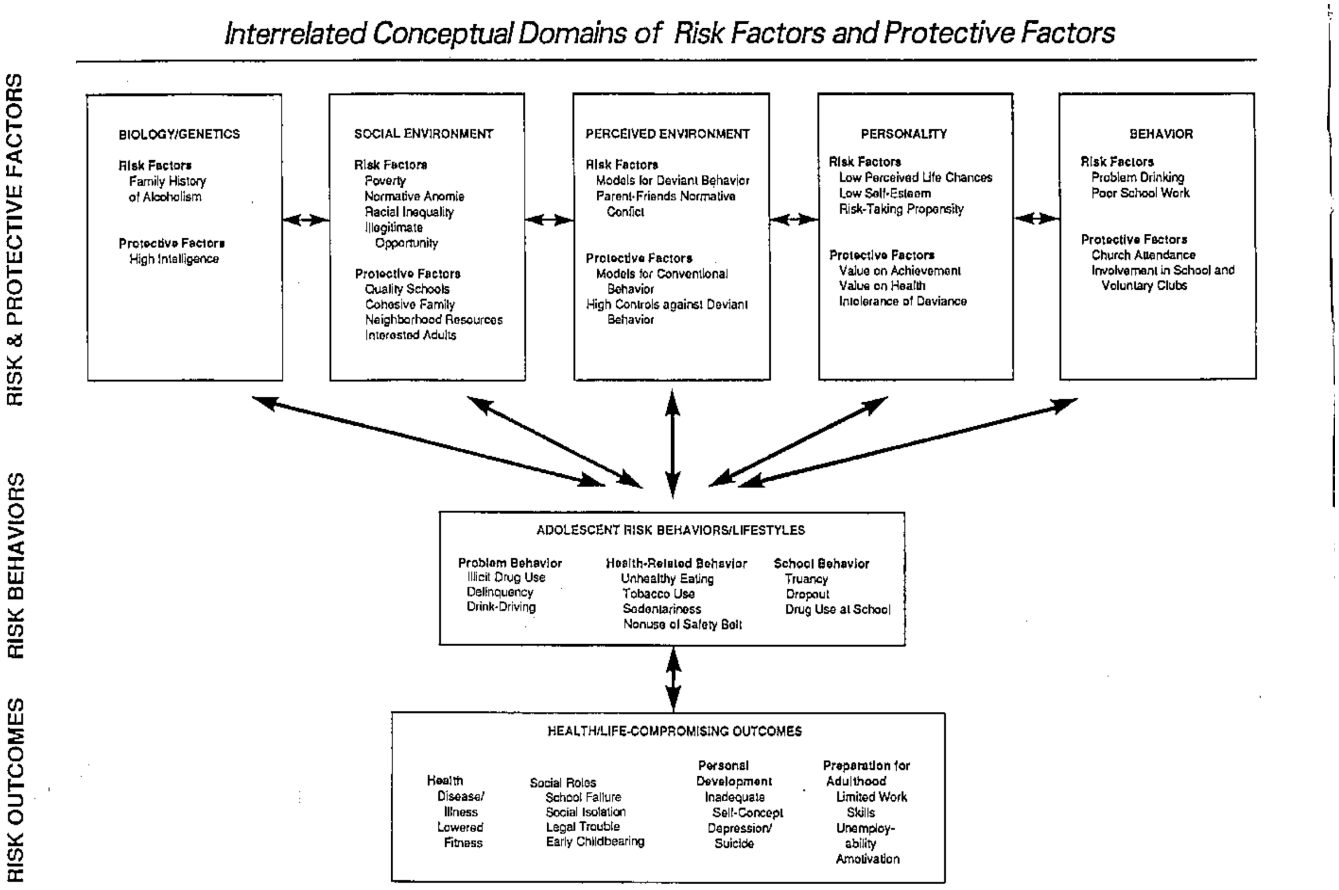
Problem Behavior Theory posits that risk behaviors are symptoms of a broader "syndrome" or lifestyle of delinquency (Jessor 1991; Sullivan et al. 2010).[6] Sociologists and public health practitioners have used PBT to inform their research on topics ranging from neighborhood effects on adolescent development (Brooks-Gunn et al. 1993) and mental health (Aneshensel, and Sucoff 1996) to youth injuries (Pickett et al. 2002). Jessor, one of the founders of PBT, describes the logic behind PBT in an article (1991) that outlines his conceptual framework of adolescent risk (although the article does not focus on PBT per se).

[6] See Watt and Sheiham (2012) for a similar theory in the world of dentistry called the Common Risk Factors Approach.

He states that risk entails social and psychological consequences as well as biomedical ones. Moreover, these consequences can be negative, positive, or mixed. For example, a fraternity member who binge drinks may face negative biomedical consequences from that behavior, but also positive psychosocial consequences stemming from the admiration of his peers. For this reason, Jessor argues that it is foolish to tell people to simply say "no" to risky health behaviors that have psychosocial benefits without offering them an alternative for attaining the positive consequences the risk behavior provides. While Jessor primarily focuses on risk reduction, he acknowledges the importance of promoting protective behaviors as well (Jessor 1991).

Jessor explains that risk not only has outcomes, but it also has predictors. Multiple distal domains (the social environment, the perceived environment, personality, other behaviors, and biology/genetics) have direct and indirect effects on risk behaviors and lifestyles (Figure 3.1).

**Figure 3.1: Conceptual Framework of Adolescent Risk Behaviors in Problem Behavior Theory (Jessor 1991:602)**



Each domain has its own set of risk factors and protective factors that influence the likelihood of risk behaviors (with protective factors buffering the effect of risk factors). To put it more clearly, according to PBT, five overarching domains (e.g. personality) contain risk factors (e.g. low self-esteem) that may or may not be mitigated by protective factors (e.g. valuing academic achievement). These risk factors, in turn, influence the adoption of risk behaviors (e.g. multiple sex partners) and these risk behaviors result in psychosocial and health outcomes (e.g. respect from peers for being a "player" or a teen pregnancy). Most relevant to this dissertation, the social environment domain contains risk factors like poverty and racial inequality, but it also contains protective factors like having a cohesive family. Risk factors in the behavior domain include other risk behaviors, which helps explain why smoking, drinking, and drug use are so often associated with sexual behaviors in the literature. Peer and family norms can function as either risk or protective factors in the perceived environment domain, and values have a similar function in the personality domain. Jessor's model of why behaviors cluster together has two additional benefits. First, it allows for change within the individual adolescent as well as within the broader social context. Second, it is bidirectional, capturing the process by which, for example, poverty leads to risk behaviors that in turn lead to more poverty.

Jessor also provides a helpful distinction between two forms of "at risk" adolescents. The first category of "at risk" adolescents are those who should truly be understood as being "high-risk" because they are already actively involved in risk behaviors. In this case, assessing risk entails determining the frequency of involvement in the risk behavior, the number of risk behaviors, the age of initiation into those behaviors, and the number of protective behaviors that may serve to counteract risk. "At risk" adolescents can also be

those who have not yet initiated risk behaviors but are at risk for doing so, and thus are optimal targets for primary (or pre-risk) prevention. Measuring the level of risk for these adolescents requires knowing the number of protective and risk factors within and between each domain.

**Prioritizing the Social Environment**

Although PBT does an excellent job of theorizing how multiple distal domains influence health behaviors, in reality not all distal domains have an equal influence on behaviors. The social environment domain, because it determines access to resources (i.e. money, knowledge, prestige, power, and social connections [Link and Phelan 1995; Phelan et al. 2004]) has more of a lasting impact on health over the life course (and the life course of future generations) than do other distal domains, because this domain perpetuates disparities even after particular health-compromising behaviors are addressed (Link and Phelan 1995; Phelan et al. 2004). For example, the poor are typically the most susceptible to infectious and chronic disease. As Paul Farmer writes, "the poor have no options but to be at risk" for diseases like TB and HIV (1997:177) because social structures prevent them from having access to resources that would protect their health. Yet of course it is not poverty in and of itself that infects someone with HIV. Epidemiologists have tried to mitigate the effect of poverty by eliminating the mediators between poverty and particular diseases, but even as they succeed at reducing disparities for certain conditions, new disparities emerge. So, while public health workers may eventually decrease disparities in HIV rates by promoting behaviors like safer sex practices and taking post-exposure prophylaxis, new disparities will emerge and persist elsewhere, either in the realm of

chronic disease (e.g. diabetes), infectious disease (e.g. the new multiple-drug resistant [MDR]-TB epidemic), or now, in the newest category of health disparities, in the conditions afflicting the elderly (e.g. Alzheimer's disease) (Meslé and Vallin 2011). This is because fundamental causes of health disparities are those that limit the resources people have. These resources, in turn, determine whether people can afford health behaviors such as wearing a face mask to help prevent TB or will be aware of medical advances like post-exposure prophylaxis. To once again quote Farmer, "those who are least likely to comply" with public health advice and medical treatment, "are those who are least *able* to comply" (Farmer 1997:186, emphasis mine).

The social environment not only shapes health behaviors, but it also has a hierarchical influence over the other domains. While biology/genetics may appear to trump all other domains, the field of epigenetics points to the role the social environment plays in activating or deactivating certain genetic tendencies (Loi, Del Savio, and Stupka 2013). Elements of the macro social environment, like culture, the economy, and war shape social networks and social interactions (Berkman and Glass 2000), subsequently shaping Jessor's other distal domains of the perceived environment, personality, and behavior. Of course not all who *can* comply, *do* comply, and humans are not robots pre-programmed to smoke or eat five servings of fruits and vegetables a day. Agency to choose one health behavior over another exists, something that can be overlooked when too much emphasis is placed on structural influences on health.

**Health Lifestyles Theory**

Health Lifestyles Theory can accommodate the complexity of the social environment. In the Introduction I offered the following definition of health lifestyles: "collective patterns of health-related behavior based on choices from options available to people according to their life chances" (Cockerham 2010:159). HLT, with its study of how the tension between agency and structure impacts health, is rooted in health disparities research and the broader literature of social stratification. Lifestyles tend to trend along the most studied categories of inequality (i.e. race, class, and gender), and the consequences of health behaviors reinforce these sociodemographic-based inequalities. This dual emphasis on behaviors and the inequalities they both stem from and exacerbate provides the tools for understanding the reproduction of health inequalities across generations.

*Historical Background of Health Lifestyles Theory*

HLT originates from the study of lifestyles in general, work pioneered by Weber and made contemporary by Bourdieu. While two other noteworthy figures in the history of sociology, Marx and Veblen, also discussed lifestyles, to them lifestyles represent class distinctions (Veblen 1934 [1899]; Marx and Engels 1978 [1846]). For Weber, on the other hand, "the stylization of life" is a means through which status groups differentiate themselves and erect social boundaries (Weber 1958 [1922]). Not all lifestyles are available to all people, however, due to economic constraints. Weber developed a dualistic account of the development of lifestyles to account for this limitation: lifestyle (*Lebensstil*) is a mix of *Lebenschancen* (life chances, i.e. the options available within the social structure) and *Lebensführung* (life conduct/choices, i.e. agency) (Weber 1958 [1922]; Abel 1991). In other

words, lifestyles reflect our status groups, and we choose from those lifestyle options that life chances have allotted us.

Weber also interprets lifestyles in light of consumption and production, a point that will be relevant when I present my model of health lifestyles later in this chapter. Consumption is the key element of lifestyles because it is through consumption habits that individuals signal their status membership to both group insiders and group outsiders (Weber 1958 [1922]; Cockerham 2013). Lifestyles require consumption and they also produce an outcome, specifically the means for more consumption. For instance, health lifestyles require the consumption of health goods like nutrient-dense foods and tennis shoes. Consuming these goods ideally leads to the production of health. Producing health, in turn, allows individuals to "consume" loftier ends like beauty or vitality (Cockerham 2013).

Although there is substantial overlap between Weber and Bourdieu, Bourdieu's most unique contribution is the concept of the *habitus* (Bourdieu 1984). While class and status are frequently related for Weber, Bourdieu thinks there is a much tighter link between class and status, one that leads to us internalizing our class and rendering us virtually unable to choose goods that do not reflect our status. This is because the material circumstances associated with class directly influence the sort of "distinctive lifestyle" that individuals adopt through the *habitus* and its corresponding tastes and dispositions. The *habitus* can be thought of as the place in our psyche where social structure and individual preferences meet (Bourdieu 1984; Bourdieu 1990; Williams 1995; Cockerham 2013). Bourdieu defines the *habitus* as "structured structures predisposed to operate as structuring structures" (1990:53). That is, the structures of the *habitus* are themselves

structured by the broader social structure (i.e. life chances). These "structured structures" usually, but not always, operate as "structuring structures" because they structure the way we see, interpret, and act in the world, somewhat akin to Kant's "categories of understanding" in *The Critique of Pure Reason* (2007 [1781]). As Cockerham explains, "the habitus serves as a cognitive map or set of perceptions that routinely guides and evaluates a person's choices and options" (2013:135-6).

The social structure's role in the *habitus* is clear, but the *habitus* also provides for some measure of agency, given that these structures are *structuring* structures rather than determining ones. Those structures need not always shape our choices, but more often than not they do. The *habitus* is thus the place where our dispositions toward the world and our habits of acting in it are created, which means our life chances limit our life choices both externally due to our circumstances and internally through the *habitus*. Our worldview and actions reproduce our social class because when we allow the "structured structures" to dictate our actions, it further reaffirms our location in the structure that structured our structuring structures, and the cycle repeats itself.

For instance, unlike the lower class, the upper class is not constrained by "the necessary" (material circumstances), which means the "structuring structure" does not structure its members' agency toward dispositions that prioritize survival (Bourdieu 1984). This means the upper class has the luxury of enjoying form over function in a variety of fields. When they do so, say by eating kale[7] (relatively pricey compared to the amount of

[7] While kale and other greens are trendy today, greens have been associated with poverty for over two thousand years, as described in Ovid's classic, *Metamorphoses*, published in 8 AD (Leftwich 2014). Ovid tells the story of how Jove and Hermes tested the hospitality of the Phrygian people. Refused by a thousand households, they finally found hospitality from a poor couple that invited the gods into their "homely shed" and served them collard greens ("coleworts") with pork (Ovid 1815[8]). Thank you to Ellen Idler for this observation.

calories per ounce), they increase their health capital (because they are eating something nutritious) and their cultural capital (because they can discuss their love of kale with other members of their class). Having health and cultural capital increases their social and economic capital, because they are forming social bonds with other upper class people when discussing and being seen eating kale, and the fact that they are healthy and socially connected increases their ability to earn money, or economic capital. Thus, eating kale can distinguish the upper class from other classes and it erects social and symbolic boundaries. These boundaries, in turn, reproduce the kale-loving upper class members' location in the social structure and help the upper class pass their social standing onto their children. Upper class children grow up eating kale and develop an innate taste for kale-related foods (a very literal understanding of the "tastes" for cultural items Bourdieu describes). Individuals who do not grow up in an upper class, kale-eating household can never experience that taste as intuitively, and therefore they will fail to convincingly signify through their cruciferous consumption that they belong in the upper class.

Unlike the *habitus* of the upper class, the *habitus* of the working class is structured by necessity, predisposing members of the working class toward attitudes and actions shaped by fears of scarcity. Returning to the kale example, the working class would be less likely to purchase kale because it costs more money (per calorie) and takes more time to acquire and prepare (per calorie) than convenience foods like pizza. The decision to eat pizza over kale is likely not even a conscious one for members of the working class: kale simply never comes to mind as a possible option. Without eating kale, the members of the lower class do not have the cultural capital to socialize about their great love for kale with members of the upper class, so they will also miss out on the social and economic capital

they might otherwise have enjoyed, in addition to decreasing their health capital by eating pizza.

*Empirical Evidence of the* Habitus

Research has provided empirical evidence for this link between class and taste. Sullivan and Birch (1990) found that children (4-5 years old, *N* = 39) exposed to novel foods like sweetened, salted, or unsweetened/unsalted tofu could be taught to enjoy the taste of those foods, but only after 8-15 repeated exposures. Moreover, once the children developed a taste for that food, they liked other versions of the food less than they did originally. For instance, children who had been exposed to sweetened tofu preferred it over unsweetened/unsalted tofu by the end of the study, but surprisingly children who were exposed to unsweetened/unsalted tofu preferred it over sweetened tofu. This finding means that children can be taught to enjoy healthy foods like unsweetened/unsalted tofu or kale, but only if parents have the resources and patience to let their children pick at each food item 8-15 times before they will eat it with gusto. Cultivating healthy taste preferences has lasting effects for health because once children begin to prefer sweetened or salted foods it becomes even harder to readjust their palates to enjoy unsweetened and unsalted foods.

Although public health officials often seek to overcome the education gradient in healthy eating through health education campaigns, a recent study (Smed and Hansen 2016) of Danish consumers ($N \approx 2{,}500$) found that taste preference, not health knowledge, best explained disparities in sugar, fiber, and saturated fact consumption between people with various educational backgrounds. The most educated (upper third) and the least

educated (lower third) consumers were equally aware of the health implications of fiber and saturated fat, while the most educated individuals were actually less aware of the health effects of sugar. However, the diets of the most educated consumers had the highest levels of fiber and the lowest levels of sugar and saturated fat. Taste mediated the relationship between education and diet, because the most educated group preferred foods that were lower in sugar and saturated fat and higher in fiber. Even within the saturated fat category more educated individuals preferred the taste of fats from fish while the least educated preferred the taste of less healthy fats from dairy and meat. The study provides support for the role of the *habitus* in health behaviors because eating a healthy diet is more about unconscious preferences than intentional thought for those with the most education.

Using the same Danish consumer dataset, but this time focusing on women (*N* = 1,376), Christensen and Carpiano (2014) explicitly tested Bourdieu's and Cockerham's theories by examining the relationship between cultural capital, economic capital, social capital and Body Mass Index (BMI). The authors found that higher levels of cultural and economic capital were significantly associated with reductions in BMI. Even after including lifestyle factors that mediated the relationship between the various forms of capital and BMI in the model, such as health-conscious eating, interest in cooking, and exercising, economic capital remained significant, pointing to the impact life chances have on health outcomes and seemingly insignificant choices like enjoying cooking as a hobby. Economic capital is important throughout the life course, as only parents with sufficient economic resources can afford to give their children the requisite 8-15 opportunities to learn to like a particular healthy food (Sullivan and Birch 1990). Poorer parents, on the other hand,

minimize the risk of wasted food by purchasing foods they already know their children will eat (Daniel 2015).

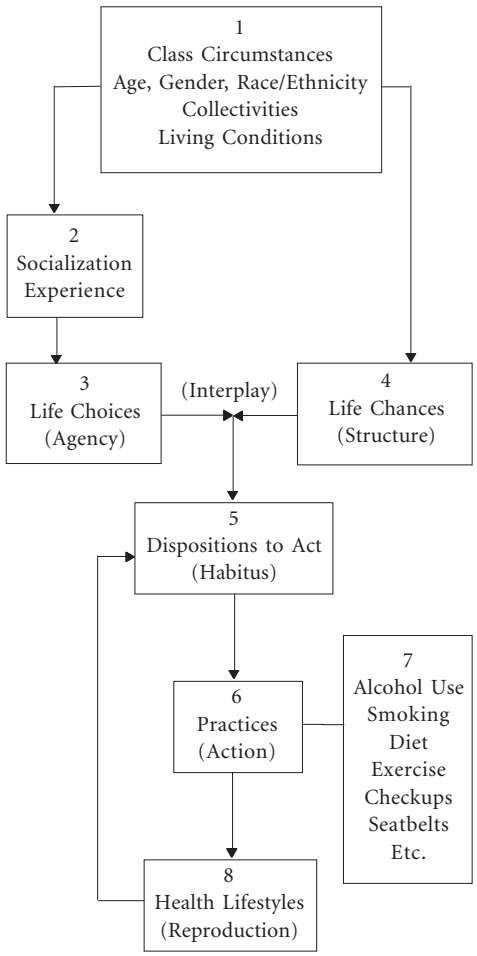
Even if someone in the lower class learns to enjoy eating kale, that person would still not accrue the same benefits as someone from the upper class. An upper class person may not be as likely to talk to a lower class person about kale, which would lead to a missed opportunity for the lower class person to gain social and economic capital. The exception proves the rule in this case because a kale-loving person in the lower class stands out as unique precisely because that aspect of their health lifestyle differs so noticeably from the lifestyle shared by other members of that class and status group. In other words, Cockerham writes, "Bourdieu holds that, while they may depart from class standards, personal styles are never more than a deviation from a style of a class that relates back to the common style by its difference" (Cockerham 2005:61-2).

While this extended kale example is a frivolous one, it nonetheless conveys the point that structure shapes the *habitus* and thereby reproduces that structure. This ongoing relationship between SES and the *habitus* is a form of intragenerational and intergenerational socialization that continues throughout the life course (Singh-Manoux and Marmot 2005). Members of the lower class may think they are exercising full agency when they stroll pass the produce section in the grocery store to purchase a frozen meal instead, but in fact that decision, and even something as supposedly personal as disliking kale, is a deeply social one shaped in the *habitus* by structure. Bourdieu's nuanced theory of cultural lifestyles led the way for studying how health lifestyles are shaped by life chances and the *habitus*. A Bourdieusian approach also provides a helpful perspective for explaining how health inequalities are reproduced from generation to generation.

*Health Lifestyles Theory Diagram*

Turning now to the actual details of HLT, Cockerham's conceptual diagram can be seen in Figure 3.2:

**Figure 3.2: Conceptual Diagram of Health Lifestyles Theory (Cockerham 2014:1037)**




In this diagram, Cockerham (2013) outlines how structure intersects with agency to influence health lifestyles. While Box 1 contains a host of sociodemographic variables linked with social structure, class circumstances are the most important in predicting health

lifestyles because of the central way distance from necessity shapes the *habitus*. Indeed, research on the clustering of health behaviors points, time and again, to the way poverty decreases the likelihood of engaging in health-promoting behaviors and increases the likelihood of participating in ones that compromise health (Pampel, Krueger, and Denney 2010). Of course, class is not the only important structural variable that influences the *habitus*. Age, gender, and race/ethnicity also play a role. Including age should be no surprise given the examples of changes in health choices over the life course discussed in the previous chapter. Cockerham (2013) adds that people tend to take better care of themselves as they get older, but they exercise less. Age discrimination would also be a relevant source of stratification that influences the *habitus*. Gender is another sociodemographic variable decisively linked to differences in health behaviors and health outcomes (Bird and Rieker 2008). Like gender, race and ethnicity are strongly associated with health behaviors and outcomes (Gee 2002; Geronimus et al. 2006; Jackson, Knight, and Rafferty 2010). For instance, race shapes taste preferences, independent of the price of food. In one study (Bahr 2007), black respondents were more likely than white respondents to name distaste for fruits and vegetables, rather than the cost of fruits and vegetables, as the main reason they did not consume enough produce.

Collectivities, the third layer of variables Cockerham includes in Box 1, include:

> "collections of actors linked together through specific social relationships and networks, such as the workplace, kinship, religion, and politics. The shaped norms, values, ideals, and social perspectives of such collectivities has been held to constitute inter-subjective 'thought communities' beyond individual subjectivity that reflect a particular collective world view" (2013:143).

Religion is a collectivity that has been shown to significantly impact health through the social capital, social support, and social control it provides (Idler 2014), and families and peer groups are critical collectivities that shape health (Berkman and Glass 2000). Beyond the obvious effects of the reproduction of social class through families, Cockerham argues that children also learn about health conditions that run in their families, how to treat health conditions, as well as what health-related values to embrace (e.g. learning that smoking is or is not acceptable).

Living conditions refer to the physical and service environments in which people live. This category is the least personal of all of the structural variables, but without proper housing, utilities, services like grocery stores, and environmental features like sidewalks and community policing that increase safety, individual health agency cannot help but be restricted. All of these variables interact with one another and, generally speaking, those coming from lower social strata fare worse in every category. Note that in Cockerham's diagram these structural variables directly determine life chances, but they also shape life choices through socialization and experience.

Socialization and experience are the next step in Cockerham's paradigm (Box 2). Socialization, Singh-Manoux writes, "is a process by which socioeconomic position over the lifecourse becomes associated with the various pathways (mediators) linking social position to health" (2005:2278). Primary socialization overwhelmingly occurs in the family for young children, and secondary socialization occurs as individuals learn new norms and expectations as they attend school, work, and continue to take on new roles over the life course. The structural variables of age, gender, race, ethnicity, collectivities, and living conditions form the social context in which socialization and experience take place. While

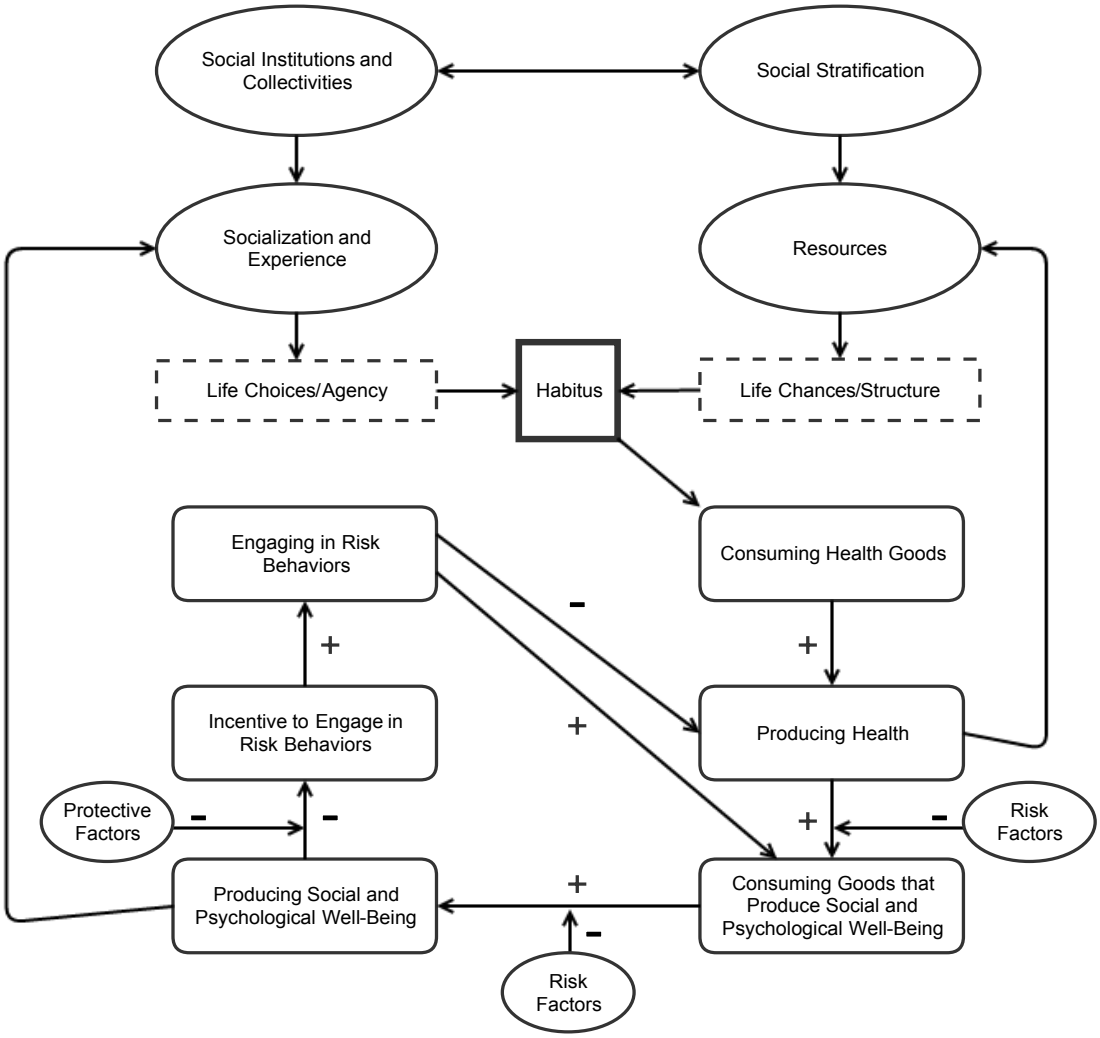
these socialization messages and experiences are shaped by the social context, new contexts can provide for socialization into different environments and new experiences. For example, someone who was raised in a lower-class household but receives a scholarship to Yale will enter a new social context that provides alternative socialization messages and experiences. Cockerham proposes that, although socialization is important, experience is the main source of agency/life choices.

At this stage in the diagram, life choices (Box 3) and life chances (Box 4) interact. This model is not completely deterministic, but Cockerham acknowledges that it leans toward structure, given that structure impacts life chances directly and life choices indirectly through socialization. Box 5, the *habitus*, is the outcome of the interaction of life choices and life chances. According to Cockerham, the *habitus* is oriented toward one of two outcomes: achieving health or disregarding it. These binary dispositions lead to either positive health lifestyles with good health outcomes or negative health lifestyles with poor health outcomes. In Box 6, the dispositions created within the *habitus* lead to deliberate, habitual, or intuitive action (or inaction) through the practice of particular health behaviors, including SNAP behaviors as well as getting checkups and wearing seatbelts in Cockerham's model. While sexual behaviors are not included in his model, he does not explicitly exclude them either. These behaviors cluster into lifestyles, and these lifestyles in turn reproduce the *habitus*. To return to the kale example, the action of trying kale makes it more likely that someone will be disposed to try a new vegetable in the future.

**A Bidimensional Model of Health Lifestyles Theory**

Although HLT has made a significant contribution to research on health lifestyles, it fails to adequately account for the bidimensional nature of health lifestyles. Cockerham argues that health lifestyles are binary, usually being mostly good or mostly bad (Cockerham 2005). Yet, research suggests that health lifestyles operate on two dimensions: a health-promoting dimension and a health-compromising dimension (Aarø, Laberg, and Wold 1995). Recall that many of the studies described in the previous chapter found evidence of three to four factors or classes, indicating that while yes, some people's health lifestyles were mostly good or mostly bad, a substantial amount of people had mixed health lifestyles. In other words, they had a combination of health-promoting behaviors and health risk behaviors, like someone who eats healthy but uses drugs or someone who never exercises but does not smoke. Why does this distinction matter? I argue that the two dimensions operate through different pathways to form one overarching lifestyle. Despite the added complexity of the formation of these lifestyles, they nonetheless continue to reflect particular class/status groups due to the initial influence of social structure on life chances and the subsequent impact of structure-influenced risk and protective factors later in the pathway (harkening back to PBT). The following diagram (Figure 3.3) depicts my model:

**Figure 3.3: A Bidimensional Model of Health Lifestyles**




The first part of the model is social stratification, which includes most of the variables Cockerham includes in his first box: class circumstances, age, gender, race/ethnicity, and living conditions. However, rather than directly influencing life chances, here they shape access to resources, namely money, knowledge, power, prestige, and beneficial social connections (Link and Phelan 1995; Phelan et al. 2004). It is the way sociodemographic characteristics predict the distribution of these resources in society, not the sociodemographic characteristics themselves, that determines life chances.

I removed collectivities from Cockerham's original list of structural variables and gave it its own place in the model, renaming it social institutions and collectivities. These social institutions mirror Cockerham's collectivities, including the institutions of the family, school, work, and religion. As with Cockerham's model, socialization and experience stem from collectivities, subsequently influencing life choices. Note that social stratification and social institutions have a bidirectional effect on one another in the model. Although social stratification powerfully predicts social institutions and subsequently socialization and experience as well, social institutions also impact social stratification and can affect resources. For example, someone who is poor may attend an under-performing high school and be socialized accordingly. On the other hand, a quality school can help overcome social stratification by giving individuals access to knowledge (one of Fundamental Cause Theory's five main resources [Link and Phelan 1995; Phelan et al. 2004]). The latter scenario may not be as common, but this model still needs to account for the potential power of institutions, particularly since I am studying the impact of the institution of the family in my research.

Just as in Cockerham's model, the *habitus* remains the central component of this bidimensional approach to health lifestyles. The dispositions in the *habitus* lead to action, but I conceptualized this action in terms of consuming health goods, given the discussion of consumption, production, and more consumption in lifestyles found in Weber and Cockerham's discussion of Weber. Even though these "goods" are behaviors, they almost always involve, directly or indirectly, the consumption of literal goods. Clearly eating nutritious foods entails directly purchasing and consuming goods (e.g. buying and eating a bag of carrots), but even a behavior like always wearing a seatbelt can only be "consumed"

if there is already a seatbelt available. An individual "consumes" the opportunity the seatbelt presents.

According to Cockerham, consuming these health goods leads to the production of health. Individuals produce health because they want to consume something else, an idea echoed by health economists who analyze the utility of health (Grossman 1972). Cockerham writes, "the aim of [producing health] is ultimately one of consumption as people use their health for some end, such as work, a longer life, increased vitality, enhanced enjoyment of their physical body, or a good physical appearance" (2013:133). While I agree with Cockerham that we produce health for some outcome that we would like to achieve/consume, I suggest that stopping at the ends he lists in fact misses the true *telos*—the ultimate end of these "ends" (Aristotle 1999 [340 BC]). Why do people want to work, to live a longer life, to have increased vitality, to enjoy their physical body, or to have a good physical appearance? The answer, I suggest, is because they want to be happy. This happiness is not a simple matter of not being sad. Yes it involves hedonic happiness, but more importantly it entails the *eudaimonic* happiness that Keyes and Michalec, following Aristotle, describe in their research (2010). Hedonic happiness refers to affective well-being, but *eudaimonic* happiness encompasses psychological and social well-being (Keyes and Michalec 2010). Psychological well-being includes feelings of self-acceptance, personal growth, life purpose, environmental mastery, autonomy, and positive connections with others (Ryff 1989). Social well-being, on the other hand, consists of feelings of social integration, social contribution, social coherence, social actualization, and social acceptance (Keyes 1998).

Each of the "ends" Cockerham describes in fact furthers people toward the ultimate end of happiness. People want to be healthy to work because they enjoy their work or the reasons why they work (e.g. the money they earn or the people for whom they provide). No one wants to live a longer life so that they can spend more time being miserable. Increased vitality enhances the ability to enjoy experiences. Enjoyment of one's physical body or beauty means little without the feelings of happiness it brings with it. For example, a weightlifter does not toil away in the gym and suffer through six meals a day of skinless chicken breasts, brown rice, and steamed vegetables simply to be healthy. He does so to see "results" and find the psychological well-being that goes along with the increased feelings of self-acceptance, growth, purpose, mastery, and autonomy he feels when he looks in the mirror (or takes another gym selfie). He also does it for the feelings of social well-being. Yes, it allows him to connect with other weightlifters as they "spot" one another or trade diet tips, but it also allows him to feel like he connects with the broader "bro" community and gives back to society when he uses his strength to help others. The weightlifter consumes health goods/behaviors that produce health so that he can "consume" those well-being outcomes that cannot be purchased at the store but are critically important for human flourishing. Even if someone does not have the lofty goal of attaining a chiseled physique, at the very minimum people want to avoid the unhappiness and lack of psychological and social well-being concomitant with "failing" to maintain good health (which Cockerham [2013] notes is increasingly stigmatized today in an era of preventable chronic diseases).

This examination of the *telos* of health behaviors leads to an obvious question: if people consume health goods to produce health in order to consume happiness, why would

anyone intentionally engage in risk behaviors? It is one thing to say an individual is constrained by necessity and thus cannot purchase healthy food (or does not have a taste for it or know how to cook it), because this person simply does not have the means or the health equivalent of the aesthetic disposition to practice health-promoting behaviors. This external constraint would make it difficult for them to produce health and consume goods that produce psychological and social well-being, but it would not reduce their desire for that end. It is something else to say that individuals consume unhealthy goods (or refrain from consuming healthy ones) in order to produce sickness because they have abandoned happiness as an end. It makes more sense to say that they engage in risk behaviors (or the negative dimension of health lifestyles) because they cannot attain the end of happiness through the health-promoting dimension of health lifestyles due to constrained life chances, but at the same time they cannot give up the innate quest for happiness. Risk behaviors provide an alternate means of reaching that end, even if the end becomes an ersatz happiness that has more in common with immediate pleasure and the dulling of pain than with true hedonic and *eudaimonic* happiness. To put it differently, we share the same goal, but how we get to that end is determined by necessity. As Cockerham points out, the balance between structure and agency is not always equal (2013). The fewer resources individuals have, the less agency they have as well. According to this bidimensional model, some individuals are forced by structure and the *habitus'* limitation on agency to pursue health-compromising behaviors to achieve the *telos* of happiness.

To summarize, people produce health to consume "goods" that promote social and psychological well-being. If that production and consumption is successful, then individuals experience social and psychological well-being. If that production and consumption is not

successful, however, then individuals have an incentive to engage in risk behaviors because social and psychological well-being will otherwise elude them. While these risk behaviors ultimately interfere with the production of health and thereby impede access to the standard pathway to consume goods that produce social and psychological well-being, risk behaviors provide a short cut to that goal.

How do risk behaviors enable the consumption of goods that produce social and psychological well-being? Recall that Jessor (1991) writes that risk is not necessarily risk of something bad. Rather, risk can lead to positive outcomes even as it simultaneously leads to negative outcomes. Risk behaviors that negatively impact health can still lead to their own version of happiness, since risk behaviors like smoking, drinking excessively, and having sex with multiple partners at least temporarily lead to affective well-being. They can help individuals cope with any lack of self-acceptance, personal growth, life purpose, environmental mastery, and autonomy they may feel (Ryff 1989). For preadolescents and teens in particular, risk behaviors may increase their sense of environmental mastery and autonomy because participating in risk behaviors can be a means of asserting their agency and independence (Jessor 1991). Although engaging in risk behaviors might lead to social sanctions and isolation, more likely that not individuals will still form positive connections with others who are engaging in the same behaviors and experience the same stigma. Risk behaviors may thus increase components of social well-being such as social integration, contribution, coherence, actualization, and acceptance (Keyes 1998) when these are not attainable through traditional pathways.

The model also incorporates Jessor's risk factors and protective factors. I locate risk factors between the production of health and the consumption of goods that produce

psychological well-being, as well as between the latter and the actual production of social and psychological well-being. Risk factors can include hardships like discrimination, stress, and mental illness, and they decrease the likelihood that individuals will move to the next step in the model. Protective factors, on the other hand, include things like social support or highly valuing academic achievement (Lammers et al. 2000). I view protective factors as moderating the relationship between the inability to produce social and psychological well-being through the consumption of goods that should produce it and the incentive to engage in risk behaviors. Jessor notes that protective factors only matter when individuals are already at risk, as is the case in my model. Those who are not at risk have no reason to consider engaging in risk behaviors. Their *habitus* is the protective factor.

Akin to Cockerham's model where the final health lifestyle loops back to reinforce the *habitus*, in my model the production of social and psychological well-being positively impacts socialization and experience (primarily experience). Similarly, the production of health positively impacts resources. Even if health does not *produce* money, it does prevent the loss of income and increased medical expenses associated with ill health. The way the model is organized, resources, via the *habitus*, impact the consumption of health goods rather directly, but the pathway to risk behaviors is very indirect, mediated by well-being (or the lack of it), risk factors, and protective factors. The risk factors and protective factors I have described mainly stem from social stratification and social institutions, so it may seem like I am improperly including those in two different parts of the model at once. However, social stratification and social institutions are included at the top of the model to indicate how they get inside the psyche of the individual through the *habitus*. Risk factors and

protective factors, found later in the model, indicate the tangible, external ways social stratification and social institutions operate in an individual's life.

*Implications of a Bidimensional Model of Health Lifestyles*

A bidimensional approach to health lifestyles has the added benefit of explaining the mix of health behavior clusters in the data. While both high health-promoting/low health-compromising (e.g. exercising and not smoking) and low health-promoting/high health-compromising lifestyles (e.g. not exercising and smoking) are easy to understand using this model, it can also explain the other two possibilities. Those who have a high health-promoting/high health-compromising lifestyle (e.g. exercising and smoking) may do so to compensate for increased risk factors and fewer protective factors in their lives. Meanwhile, those with low health-promoting/low health-compromising lifestyles (e.g. not exercising and not smoking) may be negatively affected by resources limiting the consumption of health goods, while still benefitting from strong protective factors that allow them to recognize and avoid risks.

This model also offers interesting possibilities for interventions. Given that the health-promoting pathway appears to depend more on access to resources, simply repeating health education messages will be insufficient for lasting change without addressing the social circumstances that limit health-promoting behavior. On the other hand, the model suggests individuals choose risk behaviors primarily because of gaps in social support and other protective factors. Risk behaviors help bridge that gap by providing people with new social groups and reducing unhappiness. If this interpretation of risk behaviors is correct, exhorting people to abstain from risk behaviors will not be effective

without also giving them some replacement for the role those risk behaviors play in their lives. If the purpose of the behaviors is to enhance social and psychological well-being, then neither educational nor resource-based interventions will be as immediately effective. Rather, an intervention to promote social support and protective factors (and thereby create new socialization opportunities and experiences) would seem to be most effective—and of course one of the most well-known risk intervention programs, Alcoholics Anonymous, does exactly that. Parent-based interventions, rooted in the socialization experiences of the family and the protective factors it provides, ought to be especially helpful at reducing risky delinquency/SA and sexual behaviors in preadolescents and adolescents. In this model parents should theoretically also benefit from parent-based interventions due to the fact that they too are being exposed to new socialization experiences, both in the transformed family setting and through participation in the intervention, especially when the intervention is interactive and lengthy enough to cultivate friendships.

Another interesting application of this model to interventions is that, if health lifestyles are unified (i.e. binary rather than bidimensional), then intervening in NP behaviors should also impact SA and perhaps even sexual behaviors. If health lifestyles are bidimensional, however, interventions that affect one dimension will have minimal immediate impact on the other dimension. Still, a long-term effect on the other dimension seems likely. A reduction in risk behaviors may eventually translate into more health capital, which can be exchanged for resources like economic and social capital to further improve health and provide protective factors against future risk behaviors. Likewise, improving health and enhancing an individual's ability to achieve social and psychological

well-being may translate into less need for risk behaviors later in life. I will have the opportunity to test some of these questions later in this dissertation.

**Considerations for the Operationalization of Health Lifestyles**

Many researchers analyze how health behaviors cluster together without spending extensive time contemplating the nature of lifestyles themselves, but some have identified this lack of a precise, operationalizeable definition of health lifestyles as an impediment to research (Sobel 1981; Abel 1991; Elliott 1994). Elliott, following Sobel, defines a health lifestyle as "a distinctive mode of living that is defined by a set of expressive, patterned behaviors of individuals occurring with some consistency over a period of time" (1994:122). For Elliott and Sobel health lifestyles are patterns of recognizable behaviors, a view that excludes attitudes, values, and motivations from being part of lifestyles. These behaviors are "expressive" because individuals choose them at their own discretion: "this criterion implies that the individual has some choice between alternative behaviors that service the same function or need" (Elliott 1994:121). Elliott adds that isolated actions should not count toward health lifestyle behaviors. For example, concluding that someone who uses marijuana only once is engaged in a health-compromising behavior that contributes to a negative health lifestyle is as false as saying someone who exercised once during the past year has done enough of that health-promoting behavior to have a positive health lifestyle. There must be some consistency in behaviors for them to count toward a health lifestyle.

Abel, on the other hand, suggests that it is essential to include values and attitudes in the definition of health lifestyles: "health lifestyles comprise patterns of health-related behavior, values, and attitudes adapted by groups of individuals in response to their social,

cultural and economic environment" (1991:901). Cockerham, meanwhile, describes health lifestyles as "collective patterns of health-related behavior based on choices from options available to people according to their life chances" (2013:138). Although his definition best aligns with Sobel and Elliott's focus on health *behaviors,* he does not explicitly exclude values and attitudes in his writings.

While each of these definitions is preferable to a general disregard of the meaning of health lifestyles, Sobel's (and consequently Elliott's) definition of health lifestyles is problematic because their interpretation is more similar to Jessor's Problem Behavior Theory (Jessor 1987) than to Cockerham's *habitus*-based Health Lifestyles Theory (Cockerham 2013). For those who take the *habitus* seriously it is misleading to say that behaviors are expressive because individuals can choose between options that service the same need. Rather, behaviors are expressive because they point to the world of possible options inhabited by each individual. When we view health lifestyles as emerging from the *habitus* it becomes clear that our dispositions toward actions have already been constrained, so our ability to choose between options is limited, if not illusory. As Bourdieu writes:

> "The habitus is necessity internalized and converted into a disposition that generates meaningful practices and meaning-giving perceptions; it is a general, transposable disposition which carries out a systematic, universal application—beyond the limits of what has been directly learnt—of the necessity inherent in the learning conditions" (1984:170).

What Bourdieu is essentially saying is that, through the *habitus*, distance from necessity cloaks itself as meaningful choice and these choices create meaningful (i.e. interpretable) patterns of behavior between classes. Therefore, health lifestyles are not expressive

because they indicate a choice between two options; they are expressive because they hint at the ways an individual's choices have been shaped by the "structuring structure" of the *habitus* (Bourdieu 1990). That is, a person could have a number of choices and express his status through the decision that he makes, but the true "expression" of that status is communicated by the particular choices available to him through the *habitus*, long before any actual selection is made.

While I agree with Elliott that a single instance of a health-promoting behavior does not constitute a health-promoting lifestyle, I disagree that the same logic holds true for risk behaviors, particularly among young people. For instance, while I need to exercise regularly to be "at risk" for health, I need only engage in a health-compromising behavior once to be at risk for serious health outcomes. Even if someone only drinks and drives one time, that one decision already suggests a unique disposition toward health that allows drunk driving to be a live option in the first place. Moreover, drinking and driving, even just once, puts an individual at a higher risk of a car accident during that drive.

Nowhere is this more true than in the domain of sexual behaviors, as a single decision to have unprotected sex can have lifelong ramifications such as an unintended pregnancy or an HIV infection. This is not as much the case with some other risk behaviors, like smoking. Truly being at risk for health consequences from smoking does depend on the cumulative effect of smoking over time. The point remains though that the decision to smoke in the first place already signals critical information about individuals' orientation toward health as well as the risk factors and protective factors they have in their lives. These risk behaviors also have social and psychological ramifications after even one occasion in a way health-promoting behaviors do not. Labeling theory (Becker 1963) is

helpful here. A person who exercises once is unlikely to be labeled an athlete and garner the positive benefits of that label, but someone, particularly a preadolescent, who smokes, drinks, or has unprotected sex even once is at risk for being labeled a delinquent. This label, in turn, has social and psychological ramifications that reinforce the likelihood of engaging in that behavior again in the future. Someone who never engages in the behavior at all thus has a very different set of circumstances, dispositions, and risks than does someone who engages in a health-compromising behavior just once. This distinction between health-promoting and health-compromising behaviors provides more support for a bidimensional approach to health lifestyles than a binary one.

A Bourdieusian understanding of health lifestyles would seem to invite the incorporation of attitudes, values, and motivations in the measurement of health lifestyles. Bourdieu, of course, did not address health lifestyles (aside from including a few variables about health-related behaviors in his surveys). He was more interested in determining *cultural* lifestyles. Bourdieu held that the bourgeoisie, thanks to their official education and unofficial socialization as children in bourgeois households, cultivate an aesthetic disposition in the *habitus* that lets them view the world in a "disinterested" way. "Disinterestedness" is a Kantian idea that refers to the proper disposition toward beauty (and consequently art) (Kant 1987 [1790]). An individual's disposition toward an object is "disinterested" if it does not cater to the personal interests (e.g. the desire for entertainment or moralism) of the individual perceiving the object, but rather appreciates the object on its own terms. The practices that stem from the *habitus* are therefore significantly intertwined with values, attitudes, and intentions. For instance, the art consumption practices of someone from a lower class might diverge from those of the

bourgeoisie, such as a lower class individual purchasing a print from Wal-Mart versus an individual from the upper class buying an oil painting at a prestigious gallery. However, even when the actions are the same (say, visiting the National Gallery of Art while on vacation in Washington, D.C.) the attitudes *toward* the artwork in the museum matter more than the practice of visiting the museum in the first place. A lower class individual signifies their class through their "interestedness" in the art as a source of pleasure, as opposed to the upper class appreciating "art for art's sake".

In his extension of Bourdieu to the U.S., Holt (1997) argues that elite dispositions are not limited to the arts, which we would expect given the "transposable" nature of the dispositions created by the *habitus* (Bourdieu 1990). Elite dispositions should also be understood in relation to mass cultural objects like food, décor, clothing, etc. This is because taste/*habitus* is activated in fields of consumption (which include food, décor, clothing, etc.). Because these fields and the objects within them are accessible to everyone, the true mark of distinction is in how the elite approach and interpret objects within their respective fields. This "practice" of consumption is called embodied taste. For example, the lower class and upper class individuals described above may both purchase "I ♥ DC" shirts (the same objectified taste), but the lower-class person may wear the shirt earnestly while the upper-class person wears it ironically (different embodied tastes). Thus, the focus must be on embodied tastes rather than objectified tastes for a comprehensive analysis of lifestyles.

It is thus the orientation toward objects and practices that is most important for distinguishing groups, so rather than complicating an analysis of lifestyles, collecting data about attitudes makes it possible to fully appreciate the differences between lifestyles.

Applying this idea of "dispositions-toward" to health, consumption of health lifestyles can be thought of in two ways. First, consumption choices can signal health lifestyles through the literal consumption of goods. For example, an individual can signal class through the consumption of a status brand of exercise clothing like Lululemon, or even in the disposition toward that consumption (i.e. as just another purchase rather than as a special addition to one's workout wardrobe). While this option certainly connects to class, it has little relevance to real-life health outcomes.

Another way of thinking about consumption in health lifestyles, one more relevant for medical sociology and public health, is the consumption of actual health behaviors. Status can be signaled through the "consumption" of one set of behaviors over another (e.g. the greater likelihood among members of lower classes to drink soda), as well as through dispositions toward those health behaviors (e.g. smoking because it *is* perceived as a communal norm or smoking because it *is not*). Thus even if values, attitudes, and intentions had not been shown to predict behaviors, including them in a theory of health lifestyles is required for theoretical fidelity.

It may seem problematic to include values, attitudes, and intentions in the lower, post-*habitus* part of my diagram given the fact that collectivities, socialization, and experience occur before the *habitus*. However, I will explain why this is not the case. As has been made clear, the *habitus* forms the dispositions, and the dispositions determine action. Dispositions are worldviews, which means they include values. These values are instilled through socialization and experience and applied to life choices via the values of others and the norms they create, but these values and norms from others become actualized for the self through their interaction with life chances in the *habitus*. There are many possible

norms “out there” attached to myriad social groups, but the ones we internalize are those which necessity forces upon us (due to the constraints on the possible groups that are available to us for socialization). These internalized values are the attitudes that feel natural to us and shape our actions.

Indeed, it is the naturalness of the *habitus*’ imposition of life chances on our worldviews that makes the *habitus* the source of so much automatic, intuitive action. These personal values, attitudes, and intentions emerge from the *habitus*, so they do, in fact, belong in the lower half of the diagram, even if they are intentions toward behavior rather than the actual behaviors themselves (which public health research has shown to be tightly linked [Turchik and Gidycz 2012]). Norms, on the other hand, remain important predictors in the model both as influences on the structure of the *habitus* (through the actual norms of socializing collectivities) and as indicators of protective or risk factors (via perceived norms). Given both the theoretical and empirical support for using attitudes, values, and intentions to determine health lifestyles, I will include them in my operationalization of health lifestyles. In the next chapter I will explore the potential to intervene in health lifestyles in more detail before presenting my research on health lifestyles in Chapters 5-8.

# Chapter 4: Intervening in Health Lifestyles

The ultimate aim of health research is—or ought to be—improving people's health, either at the individual or population level. This is why, while the theoretical intricacies of health lifestyles are fascinating, researchers studying health lifestyles must eventually ask this question: How do we translate our knowledge into effective interventions that promote positive health lifestyles? In this chapter I will begin to answer that question. First, I will discuss the advantages of adopting risk avoidance and pre-risk prevention strategies for behavioral interventions. Next, I will examine the role social relationships play in shaping health behaviors and health lifestyles in order to argue that interventions that incorporate social networks are especially well-suited for risk avoidance and pre-risk prevention interventions. Finally, I will focus on the parent-child relationship and consider how effective parent-based interventions are at altering health behaviors and health lifestyles.

## Public Health Intervention Strategies

Public health interventions typically follow either a "risk reduction" or a "risk avoidance" approach. Risk reduction strategies target risk behaviors like using drugs and having concurrent sexual partnerships. These interventions seek to mitigate the harmful consequences of risk-taking through programs, such as needle-exchanges and campaigns to promote condom use, and they are particularly helpful for concentrated epidemics among the most at risk populations (MARPs) (Green and Herling Ruark 2011). For generalized epidemics that afflict a wider population than MARPs, on the other hand, risk avoidance strategies are not as effective.

For instance, in a concentrated HIV epidemic the disease is transmitted primarily in MARPs like intravenous drug users, sex workers, and men who have sex with other men (MSM). In a generalized HIV epidemic, however, heterosexual vaginal intercourse is a primary mode of transmission, leading to higher rates of infection among females than in a concentrated HIV epidemic and more risk of perinatal infection (Green and Herling Ruark 2011). A public health campaign to promote condom use among MARPs may substantially reduce the risk of transmission in that community, especially since MARPs have an incentive to use condoms consistently and correctly due to a perceived high risk of infection. A condom promotion campaign would not be as effective in a general epidemic, however, because the risk of contracting HIV is lower for members of the general population, and thus the perceived benefit of heeding risk reduction advice is smaller. Green (2003) argues that risk reduction interventions may actually put some people at increased risk for infection because the promise of "safe sex" with a condom can lull them into complacency, while in reality condoms are only 80% effective at preventing heterosexual HIV transmission when used consistently and correctly (Weller and Davis 2007), requirements that are less likely to be met by a 15-year-old having sex for the first time than they are by an experienced sex worker. Encouraging people to avoid risks in the first place, such as by delaying sexual debut and practicing monogamy, may be the best option for generalized epidemics (Green and Herling Ruark 2011). Risk avoidance strategies are a natural response to fear of harm (Green 2003), so public health workers may find that individuals are more receptive to such messages.

Many of the health problems facing Americans today can be thought of as generalized epidemics. Chronic preventable conditions like diabetes, hypertension, and

obesity are common throughout the population, while sexually transmitted infections (STIs) such as gonorrhea and chlamydia are widespread among teenagers and young adults. Risk reduction strategies are possible for each of these problems (e.g. limiting sugar consumption to 25 grams a day to reduce the risk of Type 2 diabetes or wearing a condom to prevent an STI), but risk avoidance strategies are also possible (e.g. removing all products with added sugar from schools or delaying sexual debut). HIV, while still primarily a concentrated epidemic in MARPs, shows features of being a generalized epidemic in some parts of the US, such as the District of Columbia's 8th Ward, where the HIV prevalence rate among adolescents and adults is 3.1% (Kaiser Family Foundation 2012). 25% of new HIV infections in the US in 2010 occurred among heterosexuals (Kaiser Family Foundation 2014), and heterosexual transmission accounts for the majority of HIV infections among black and white women (Kaiser Family Foundation 2013). The heterosexual transmission rate for women indicates a need for risk avoidance interventions tailored for a generalized HIV epidemic in addition to risk reduction strategies intended for MARPs.

With risk reduction there is the assumption that people are already engaging in the risk behavior and we can only focus on reducing the harm involved. Risk avoidance offers more protection against harm, but it is difficult to convince people to change, let alone avoid, risk behaviors. Pre-risk prevention takes risk avoidance strategies one step further by shaping an individual's orientation to risk before that risk becomes a "live option" in his or her life. For instance, rather than waiting until teenagers are engaging in sex to tell them to start wearing condoms, or until they are contemplating becoming sexually active and must be told to abstain from sex, pre-risk prevention works with preadolescents and young adolescents to strengthen their social networks, sense of self-worth, and goals in life in an

effort to make risk behaviors less appealing in the first place (Miller et al. 2009a). Pre-risk preventions can address a "nothing to lose" attitude that otherwise increases the likelihood of risk behaviors such as selling drugs or using weapons in adolescence, as well as early sexual debut (Harris, Duncan, and Boisjoly 2002).

The ultimate form of pre-risk prevention would be to intervene upstream from the *habitus,* because then the decision to avoid risk would not be a decision at all—no more than the "decision" to eat foods that are higher in fiber was an active decision for the most educated group in the Danish study cited in the previous chapter (Smed and Hansen 2016). If an intervention can change the *habitus*, then that "structured structure predisposed to operate as a structuring structure" makes the decision to be healthier for us, a substantially more preferable situation than having to constantly exert willpower to say no to any number of pleasures in life that also have health risks. Thus, the first part of the answer to the question is that health lifestyle researchers should understand that the best interventions would be ones that address the *habitus*. Translating theory into action is more difficult, of course. However, recall that, according to my model, health risk behaviors are associated with too many risk factors and too few protective factors, and that feedback loops can allow downstream factors to affect socialization and experience and those, along with greater access to resources, reshape the *habitus*. Increasing access to resources for everyone in society would have the biggest health impact on the entire population, but such an intervention would be difficult and costly (Frieden 2010). A mid-range solution is more feasible while still remaining in the social determinants paradigm. Socialization interventions provide a viable path for improving the health of individuals, families, and wider social networks. Not only would these interventions eventually change the *habitus* by

impacting the collectivities that influence the structuring structures of the *habitus*, but they would also promote the development of protective factors like social connections that provide an immediate downstream opportunity for reducing the incentive to engage in risk behaviors.

**Social Relationships and Health**

Social relationships have long been linked to health outcomes (Durkheim 1951 [1897]; Bruhn et al. 1966; Berkman and Syme 1979), and a variety of mechanisms have been proposed to explain the relationship between the two, such as the provision of instrumental, informational, and emotional support; the sense of purpose and norms associated with social roles, bonding, social comparisons, and social control; and the direct effects of personal contact (e.g. oxytocin production or intimate partner violence) (Berkman and Glass 2000). Peers and the family, particularly parents, are two extremely influential collectivities in the development of health behaviors, although we are not always aware of their impact on our lives (Abella and Heslin 1984; Christakis and Fowler 2009). These collectivities do not operate independently of one another, of course, but empirical research has teased out the unique ways peers and parents contribute to the development of health lifestyles. In this section I will limit my discussion to the impact of social relationships on preadolescent and adolescent health due to the importance of the "long arm of childhood" over the life course and the focus of the Parents Matter! intervention studied in this dissertation.

*Peers*

Perceived peer norms have a tremendous effect on preadolescent health lifestyles. Previous research (Velderman et al. 2014) (*N* = 898) has shown that among young adolescents (12-15) peer norms are associated with delinquent lifestyles (including alcohol use, smoking, drug use, and unhealthy eating). For older adolescents (16-18) peer norms influence delinquent lifestyles (including alcohol, smoking, unsafe sexual behavior, unsafe driving, and aggression) as well as healthy lifestyles (eating healthy and exercising). Yang, Tan, and Chen (2014) examined the interaction between race and the influence of peers on health-compromising and health-promoting behaviors. Analyzing data on 9$^{th}$ and 11$^{th}$ grade students in California (*N* = 46,588), the authors found that feeling connected to friends was not associated with exercising or eating a healthy diet for Asian Americans, Pacific Islanders, or whites, but it did increase the likelihood of substance use for all three groups and violent behavior among Asian Americans and whites. These findings lend support to my model because peers appear to be more influential in the development of risk behaviors than in the development of health-promoting behaviors.

Peer norms are especially relevant for understanding the sexual intentions and attitudes of preadolescents. Bobakova (2013) found that Slovakian 15-year-olds (*N* = 1,605) who thought that "most or all" of their peers had had sex were eight times more likely to have already had sex themselves. A study on African American preadolescents using the dataset shared by this dissertation observed that perceived peer norms about dating and sexual experience were associated with attitudes toward having sex as well as intentions about precoital touching and sex (Wallace, Miller, and Forehand 2008). Cox et al. (2015) found that 7$^{th}$ graders (*N* = 1,736) in the South Central US who felt teen pregnancy was

common in their school were twice (girls) or three times (boys) as likely to agree that having sex is normal for boys and girls their age. For girls, having a friend who was a teen parent made them twice as likely to think that sex in early adolescence is the norm.

Peers also impact lifestyles over time, shaping the development of weight loss, smoking, delinquency, and sexual behaviors. In one study the ability to make friends and feeling respected by peers reduced the likelihood that children would transition from overweight to obese (as opposed to remaining at a healthy weight) between 5$^{th}$ and 8$^{th}$ grade (*N* = 6,060) (Chang and Gable 2013). Chen and Jacques-Tiura (2014) followed 12-16-year-olds (*N* = 4,088) for 11 years to learn how peers influenced when adolescents began smoking. The authors found that there were four smoking trajectories in the data: those who began smoking before age 12, those who began smoking during the teenage years, those who began smoking by age 25, and those who had little or no risk of smoking. For both males and females, respondents who had friends who smoked were around 3.5 times more likely to be in the pre-teen smoking trajectory and 2.5 times more likely to be in the teen smoking trajectory. Wang et al. (2014), meanwhile, studied the risk behavior trajectories of Bahamian preadolescents over the course of three years (*N* = 1,276). These trajectories included risk behaviors like truancy and alcohol use, as well as sexual risk behaviors like having multiple sexual partners. Girls and boys who had "high-risk" peers (i.e. peers who scored in the upper quartile for involvement in risk behaviors) in sixth grade were three times as likely to belong to the highest risk trajectory than to the lowest risk trajectory three years later.

*Parents*

Like peers, parents also impact adolescent lifestyles through norms, but these norms are communicated and enforced through family connectedness, supportive parenting and parental monitoring. Parents affect all domains of adolescent health, from diet and physical activity (Sallis 1993) to substance use (Leventhal and Keeshan 1993) and violence (Earls, Cairns, and Mercy 1993). Although it is worth considering the role the family plays in health promotion (Christensen 2004), research supports what my model predicts, namely that parents have more of an impact on the development of health risk behaviors. For instance, Yang, Tan, and Chen (2014), described earlier, examined the impact of feeling connected to family. Family connectedness was only associated with one health-promoting behavior, a healthy diet, and only for whites. However, family connectedness significantly decreased substance use and violent behavior for all three groups studied. In a study (Williams et al. 2000) of New York $9^{th}$-$12^{th}$ grade students ($N$ = 271) parental emotional support was associated with decreased levels of alcohol, marijuana, and cigarette use, and having ever had sexual intercourse. High levels of maternal bonding were associated with a decreased risk of early sexual debut in Bobakova (2013), and supportive parenting significantly decreased the likelihood that $7^{th}$ graders believed having sex in early adolescence is normal behavior (by 76% for girls and 82% for boys) (Cox et al. 2015).

Parental monitoring is equally important in the development of adolescent health behaviors. Wang et al. (2014) found evidence that parental monitoring can promote some positive health behaviors. In their study of Nebraskan 12-18-year-olds ($N$ = 791), high levels of parental involvement in adolescents' diets and time spent watching television or playing video games belonged to a latent class that included healthy diet and exercise. However, as

with supportive parenting, most research on parental monitoring focuses on health risk behaviors. In the study of smoking trajectories mentioned earlier, Chen and Jacques-Tiura (2014) also examined the role of parental monitoring. Lower levels of maternal and paternal parental monitoring were associated with membership in preteen and teenage smoking trajectories, with the lowest levels of parental monitoring occurring in the preteen smoking trajectory group. Similarly, Mistry et al. (2009) observed that, when compared to the healthiest cluster of SNAP behaviors, adolescents who reported lower levels of parental monitoring were 30% more likely to belong to less than ideal NP clusters and 60% more likely to belong to a "risk taking cluster" that included smoking and drinking. In a study of Finnish adolescents (*N* = 4,731), Latendresse et al. (2008) found that the relationship between parents' alcohol use and adolescents' alcohol use at 14 and 17 ½ was mediated by adolescents' perceptions of parenting behaviors. The perception at 14 was especially important for predicting adolescent alcohol use. Parental monitoring and discipline were the most powerful mediators, although parental warmth also significantly impacted adolescent drinking. In another study (Li, Stanton, and Fiegelman 2000) parental monitoring reduced rates of unprotected sex and drug use for low-income African American 9-15-year-olds over the course of four years

Velderman et al. (2014) examined the impact parental variables had on young adolescent and adolescent health lifestyles. For young adolescents (ages 12-15) the alcohol factor (alcohol, smoking, drugs, lack of sleep) was associated with reduced parental control. The delinquency factor (aggression, smoking, unhealthy diet) was associated with lower levels of parental monitoring and parental norms. For older adolescents (ages 16-18) lack of parental control and parental norms was associated with the alcohol factor (alcohol, unsafe

sexual behavior, unsafe driving, vigorous physical activity), decreased parental monitoring was associated with the delinquency factor (aggression, drug abuse, smoking, not eating breakfast, lack of sleep), and no parental variables were associated with the positive health factor (eating breakfast, produce consumption, and physical activity) in the adjusted analysis. This provides support for my model because it demonstrates that protective factors like parental monitoring reduce the incentive to engage in risk behaviors more than they promote beneficial health behaviors.

In the study on Bahamian preadolescents cited earlier, Wang et al. (2014) also examined the role that parental factors played in the development of risk behavior trajectories. Boys whose parents were in the lower quartile for parental monitoring were over three times more likely to belong to the high-risk behavior trajectory group instead of the low-risk behavior trajectory group, although this relationship was not significant for girls. Poor parental monitoring mattered most in the presence of other environmental risk factors like having high-risk peers or living in a high-risk neighborhood, because these risk factors had a multiplicative rather than additive effect on preadolescents' risk trajectories, underlining the importance of having at least one layer of protective factors to reduce the incentive to engage in risk behaviors. Another study (Cleveland et al. 2005) that considered the impact of neighborhoods, this time among African American 10-12-year-olds (*N* = 714), found that parental monitoring, parent-child communication about substances, and parental warmth protected against substance use at a five-year follow-up by fostering a less favorable perception of adolescent substance use and a lower perceived susceptibility to substance use. This buffering effect was most pronounced among adolescents who lived in high-risk neighborhoods.

Finally, Kwon and Wickrama (2014) used data on 407 Iowan families to model the relationship between family economic pressure, parenting practices, and adolescent health-promoting and health risk behaviors. The authors found that family economic pressure decreased adolescent perception of supportive parenting practices (a composite variable that included aspects of parenting like warmth and parental monitoring). As would be expected from my model, supportive parenting did not directly impact health-promoting behaviors among adolescents like eating right and exercising, but it did decrease adolescent participation in health risk behaviors involving substance use. Supportive parenting did mediate the relationship between both sorts of behaviors, however, through the promotion of adolescent mastery and the reduction of adolescent delinquency (e.g. stealing, running away, vandalizing property). The authors also saw gender variation in their results. Parenting impacted girls' risk behaviors directly, but for boys the relationship between parenting and health risk behaviors was mediated by delinquency.

Parenting practices affect more than just physical health lifestyles of course. Uninvolved parenting and parental rejection have been shown to mediate the relationship between childhood community adversity and depression and educational attainment in adulthood (Wickrama and Noh 2010), which in turn have implications for adult health. In general, the evidence from these studies and many others (e.g. Karofsky, Zeng, and Kosorok 2000; DiOrio et al. 2001; Borawski et al. 2003; French and Dishion 2003; Hutchinson et al. 2003; Rai et al. 2003; Santelli et al. 2004; Rose et al. 2005; Aspy et al. 2007; Buhi and Goodson 2007; Zimmer-Gembeck and Helfand 2008) suggests that social connections play an important role in the prevention of risk behaviors more so than in the promotion of positive health behaviors.

**Parent-Based Interventions**

By this point the importance of family relationships for health should be abundantly clear. While siblings are certainly sources of socialization for preadolescents and early adolescents (Stafford 2013; Cox et a. 2015), parents are crucial for mitigating the impact of high-risk peer groups. As Perry, Kelder, and Komro (1993) write:

> "Since adolescents with less adult supervision miss out on the tempering effect of adult values, and at a time when they are developing interpersonal skills to deal with peer pressure, for example, they are more susceptible to peer influences and at a higher risk for poor peer group selection" (1993:77).

Those "tempering" adult values must be communicated properly because preadolescents misperceive their parents' values as being more liberal, particularly about dating and sex, than they actually are (Gound et al. 2007; Olsho 2009). The most effective communication method may vary based on the value and the child's gender. For instance in one study instrumental values like being honest were passed on to boys through maternal coercive control, while terminal values like valuing beauty were only communicated to boys through maternal inductive reasoning (Whitbeck and Gecas 1988). Any communication is better than no communication, however. Adolescents who have poor communication with their parents are more likely to participate in a range of delinquent behaviors, including drinking, smoking, and having sex (Jessor and Jessor 1977; Shrier et al. 1996; Huebner and Howell 2003). Left unaddressed, these problem behaviors can damage parent-child attachments for multiple generations (Brook et al. 2012).

Despite the key role parents play in the development of their children's health lifestyles, of course parenting does not come with a guide book and confusion exists over

how best to parent with an eye towards shaping a child's future. Parents impact their children's health through demographic factors (income, parent education, family structure, ethnicity), cognitive factors (health knowledge, health beliefs, health locus of control, self-efficacy, social learning and modeling, and parental supervision), and the functional or dysfunctional nature of family interactions (Kotchick et al. 2001; Soliday 2004). Public health interventions can help parents use all of these avenues of influence for the benefit of their children.

Popular conceptions of a strained parent-teen relationship would suggest that parents are the last people preadolescents and adolescents want to listen to for life advice. Fortunately this stereotype is incorrect, as it overlooks the fact that parents and adolescents continue to share many of the same values (aside from more superficial values about things like appearance and music) and adolescents report respecting, relying on, and feeling connected to their parents, despite increased levels of conflict (Crockett and Petersen 1993). Indeed, adolescents say their parents are among their top preferred sources of health information and support for health issues (Millstein 1993), even about sexual health (Olsho et al. 2009). Communicating about sex is one subject where parents could especially use assistance, however, because whether parents think they are talking about sex more than they actually are or adolescents simply are not paying attention, parents and children disagree about the frequency of conversations about sex. One study found that 93% of parents indicated having ever talked about sexual issues with their children, while only 72% of adolescents reported having had these conversations with their parents (Olsho et al. 2009).

Parents are particularly well-positioned to alter the health lifestyle trajectories of their children. The salience of health promotion or risk reduction messages depends on an individual's developmental stage, something that is important to keep in mind for adults but especially relevant for preadolescents and adolescents (Millstein 1993). Krauss and Miller (2012) argue parents should act as their children's primary health educators because they can have ongoing discussions about health topics with their children that are sequential, time-sensitive, tailored, and partnered with the accountability of parental supervision. Nowhere is this "parent as primary health educator" idea more important than when it comes to the development of sexual behaviors. Parents are knowledgeable and attuned to their children's stages of sexual and emotional development, questions about sex, and value systems, unlike other common agents of sexual socialization such as politically-determined school sex education curricula (Santelli et al. 2006), sexual myth-believing peers, and media depicting a superficial understanding of sex. When parents do not speak to their children about sex they contribute to social norms that create a climate of sexual shame for adolescents (Shoveller et al. 2004).

*Parent-Based Interventions in Practice*

While parent-based interventions focused on managing risk behaviors through behavior modification have existed since the 1960s, evidence-based parenting interventions from a population health, prevention-oriented perspective only began to grow in popularity in the last twenty years (Sanders and Ralph 2004). Interventions targeting multiple risk behaviors for individuals of all ages have been increasing since the 1990s, with an average of about five publications on multiple risk behavior interventions per year from 1990 to the

mid-2000s growing to over 40 publications in 2012 alone (King et al. 2015). Along with schools (Sinha 1992; MacArthur et al. 2012; Allara et al. 2015), the family setting has been a common location for effective interventions targeting multiple risk behaviors in preadolescents and adolescents. In one recent systematic review (Hale, Fitzgerald-Yau, and Viner 2014) that spanned the biomedical and social sciences literature from 1980-2012, the authors identified 44 interventions evaluated through randomized controlled trials (RCTs) seeking to address two or more health risk behaviors in individuals who were 10-19 years old at baseline. Only five of the interventions were family-based, but all five of these were effective for at least two behaviors, and two of the interventions were rated as strongly effective (an accolade earned by only 51% of the sample). Two of the five interventions significantly affected sexual risk behaviors, and all five interventions remained successful at follow-up.

Unfortunately, multiple-risk behavior interventions in any setting are typically limited to delinquency/SA-related behaviors, although at least one intervention has addressed nutrition and physical activity behaviors as well (Allara et al. 2015). In fact, only 17% of the interventions included in the systematic review addressed sexual risk, as compared to 100% of the interventions addressing some form of substance use. In another systematic review of multiple health risk behavior interventions (Jackson et al. 2011; Jackson et al. 2012), this time for 5-25-year-olds, 18 studies included sexual risk behaviors along with substance use, but only 13 were strong or moderately strong methodologically. The authors ranked the methodological rigor of the studies as strong, moderate, or weak based on six factors: "selection bias, study design, confounders, blinding, data collection methods and withdrawals and dropouts" (2012:734). Just three of the 13 studies classified

as strong or moderate impacted both health domains, and all three of these studies had a parent-based component. It is worth noting that these three studies were targeted at relatively young age groups, namely first graders, 10-11-year-olds, and 15-year-olds. The intervention discussed in this dissertation, Parents Matter!, was not included in any of the systematic reviews, but it shares many of the traits of the most rigorous studies: a randomized controlled trial to prevent selection bias, a multi-armed intervention study design, the inclusion of multiple potential confounders in the study questionnaire, thorough data collection at six different time points over three years, and a proactive strategy to promote retention, although given the nature of the treatment blinding was not possible.

Parent-based interventions that focus solely on sexual behaviors are rare, despite the risks of STIs and teen pregnancy that adolescents face. Manuel (2013) conducted a systematic review of literature published from 1990 to 2012 and found 17 parent-based sexual risk interventions for individuals ages 9-19 (three of these studies also examined substance or delinquency behaviors), including the intervention assessed in this dissertation, Parents Matter!, and its sister program, Families Matter! After examining the results of each intervention, Manuel concluded that parent- (rather than family-) based interventions were more effective, as were interventions that focused on multiple risk behaviors, parent-child communication, parental monitoring, and parental support. In a similar systematic review of parent-based interventions, Downing et al. (2011) surveyed the literature from 1990-2009 for interventions targeting parents of 5-19-year-olds in Western countries. Like Manuel, Downing et al. also identified 17 studies that fit the inclusion criteria, with most, but not all, of the interventions occurring in both systematic reviews. Downing et al. noted that the interventions improved sexual health communication, but

parent-child communication itself did not reduce sexual risk behaviors. The authors suggested that multiple risk behavior interventions might be more effective in part because those programs tend to have longer interventions and follow-up periods. A handful of the interventions cited in the review targeted African American or Latino communities in particular. Parenting interventions should be racially and ethnically sensitive if possible, because although previous research has shown that class trumps race in regards to parenting (Lareau 2002), racial socialization is an important aspect of childrearing in many families (Thornton et al. 1990; Lacy 2004).

One understudied aspect of parent-based interventions is the potential benefit for parents (Miller 2013; Dinaj-Koci et al. 2015). There is evidence of reciprocal relationships between the health of mothers and their children (Garbarski 2014), which suggests that the intergenerational transmission of health is not unidirectional. If the health of children can impact the health of parents, than it makes sense to say that interventions that improve the health of children may also improve the health of parents, either directly (e.g. children get fewer colds after a handwashing intervention so parents get fewer colds too) or more likely *indirectly* (e.g. children bring home vegetables from a school garden so parents eat more vegetables too, or children share knowledge learned during an intervention with their parents), especially given research demonstrating that children can shape their parents' attitudes (Glass, Bengston and Dunham 1986). Parents may also strive to be healthier than they would be as non-parents in order to serve as good role models in health and life for their children or to make sure they can live to see their children progress through life's milestones. What this bidirectionality means for public health is that an intervention for children may have health implications for parents as well, particularly, it would seem,

parent-based interventions intended to foster parent-child communication. In fact, one study evaluating the parent-based Caribbean Informed Parents and Children Together intervention (ImPACT) (Wang et al. 2014a) found that the HIV prevention intervention for 10th grade students, intended to improve sexual risk communication between parents and their children (*N* = 1,883 dyads), also increased parents' knowledge of how to properly use condoms (Dinaj-Koci 2015). A similar ImPACT-based intervention among African American families in the US also found that the intervention improved parents' ability to use condoms (Stanton et al. 2000).

This indirect avenue of shaping the health lifestyles of adults is promising, because while adults are also targeted for multiple risk behavior interventions, as with such interventions for adolescents, sexual behaviors are often not included. A recent systematic review (King et al. 2015) of the literature from 1990-2013 identified 220 studies of multiple risk behavior interventions across the SNAP and sexual behavior domains for individuals 16 and older. Only 15 of these studies included sexual behaviors, while just eight studies addressed multiple risk behaviors of any kind in minority populations. The results of the 220 studies were not included in the review, so the effectiveness of the interventions is unclear. A parent-based intervention would have the additional benefit of reaching two populations for the price of one. Furthermore, parents who might otherwise resist participating in a public health program may be more willing to do so for the sake of their children, unwittingly improving their own health in the process.

This chapter, along with the two previous chapters, provided an extended discussion of topics that are key for understanding health lifestyles, including health disparities over the life course, the clustering of health behaviors, theories of health lifestyles, and health

lifestyle interventions. In the next part of this dissertation I will first lay the groundwork for my research on health lifestyles in Chapter 5 by describing my methods in detail. In Chapters 6-8 I will share the results of my research. I will then conclude with a broad discussion of how these findings expand the conversation about health lifestyles in sociology and public health in Chapter 9.

# Chapter 5: Methods

In the previous chapters I discussed the importance of reconsidering Health Lifestyles Theory from a bidimensional perspective, as well as the need to study health lifestyles and how to intervene in them over the life course. This research, I argued, is especially important for preadolescents in the African American community. In this chapter I will present the data, measures, and analyses I used to expand knowledge about the content, development, and transmission of heath lifestyles, as well as to test the efficacy of parent-based interventions on health lifestyles. To recap, I will be answering the following questions in this dissertation:

## Topic 1: Reconsidering Health Lifestyles

*Question 1:* Do sexual risk behaviors, intentions, and attitudes share a health lifestyle in common with generally studied health behaviors like exercise, nutrition, smoking, and alcohol habits in preadolescents and adults?

*Question 2:* What social factors are associated with preadolescents' and adults' health lifestyles?

*Question 3:* Are baseline health lifestyles associated with future sexual health behaviors, such as perceived odds of having sex within the next year (for preadolescents) and number of sexual partners (for adults)?

**Topic 2: Understanding the Development and Transmission of Health Lifestyles**

*Question 4:* Do preadolescents and adults maintain one health lifestyle or does that lifestyle change over time?

*Question 5:* Does a relationship exist between parents' and children's health lifestyles over time?

*Question 6:* What role do socioeconomic status (SES), parents, peers, and other social factors play in the intergenerational transmission of health lifestyles?

**Topic 3: Intervening in Health Lifestyles**

*Question 7:* Do parent-based interventions impact the general and sexual health behaviors of children and their parents?

*Question 8:* Do parent-based interventions alter the health lifestyles of children and their parents?

*Question 9:* Do parent-based interventions affect the intergenerational transmission of health lifestyles?

**Data**

My data source is a series of surveys conducted from March 2001 to September 2006 in conjunction with the Parents Matter! Program (PMP) intervention. Researchers from the University of Georgia, Georgia State University, and the University of Arkansas for Medical Sciences proposed the Parents Matter! Program (PMP) in 1999, and it was funded that same year through a collaborative partnership with the CDC (Forehand et al. 2004).

Targeted at African American youth, the program aimed to prevent risky sexual behaviors and ultimately HIV infections by improving parent-child communication about sex and promoting positive parenting skills. PMP was grounded on four empirically based social-psychological theories: Social Learning Theory (Bandura 1971), Problem Behavior Theory (Jessor 1987), the Theory of Reasoned Action (Ajzen and Fishbein 1980), and Social Cognitive Theory (Bandura 1986). These theories are commonly used to guide sexual risk behavior prevention programs for adolescents, but PMP uniquely incorporated parents into its prevention program (Dittus et al. 2004). Because the intervention focused on parents as a means to reach children, data were collected from parents and their children (and in some cases co-parents as well). The surveys were conducted in six waves: baseline (*N* = 1,105 complete dyads), post-intervention (*N* = 839), six-month follow-up (*N* = 774), one-year follow-up (*N* = 754), two-year follow-up (*N* = 701), and three-year follow-up (*N* = 651). Co-parents participated at baseline (*N* = 162), six-month follow-up (*N* = 96), and two-year follow-up (*N* = 84).

The researchers recruited dyads of one parent or guardian and one child, provided the dyads met five inclusion criteria. First, the parent had to be the child's parent or legal guardian. Second, the parent had to self-identify as African American. Third, the child had to be 9-12 years old and in the $4^{th}$ or $5^{th}$ grade. Fourth, children must have lived with the study parent for at least three years (continuously) before the study. Fifth, both members of the dyad needed to speak English. In the event that two children and/or parents were eligible, the oldest child was selected and only one parent could attend the intervention. The other was considered a co-parent for the purposes of the study. Researchers limited

participation to one parent because they worried about dosing effects if more than one parent attended the intervention for some children but not for others.

Participant recruitment occurred with the assistance of a Community Liaison (CL) and Community Advisory Board (CAB) (Secrest et al. 2004) in each of the three locations. Participants were actively recruited for two or more weeks before each new group began, although CLs and CABs had "feelers" out for potential recruits even before the intervention officially commenced (Ball et al. 2004). At each site the same types of organizations were approached as recruitment venues, although different proportions of individuals were recruited at these venues across the three sites. These venues included "public schools, public housing, youth and family programs (e.g., Boys & Girls Clubs, parks & recreation programs, community centers), private and public health agencies, and churches" (Ball et al. 2004:23). The actual recruitment strategy involved flyers; presentations at public housing and local events; publicity in local media; distribution of "goodies" labeled with PMP information; door-to-door discussions; direct invitations from CLs, CABs, and other community members; word-of-mouth from previous participants; referral forms from previous participants; and the selection of facilitators who were parents and/or teachers in the community.

The questionnaires were computer-based. Wearing headphones, participants listened to each question as it appeared on the screen, and they responded via mouse or keyboard. The computers were located in different parts of the room to maintain confidentiality. Adults could ask questions if they had any problems, and interviewers watched the children closely to make sure they stayed on task and did not having difficulties operating the computer. Children's assessments took about 30 minutes to complete, while

the parents' assessments took roughly 45 minutes. The children's assessments had a "skip" format for questions about sex that were not relevant. Researchers gave the participants $15 per adult and $10 per child for each assessment, and children also received a small toy. Participants had three opportunities to re-schedule missed assessments, but if they missed two in a row after the intervention they were dropped from the study.

Turning now to the actual intervention, dyads participated in one of 43 group intervention cohorts located in Atlanta, GA (14 cohorts); Athens, GA (13 cohorts); and Little Rock, AR (16 cohorts). There were three arms of the intervention: the Enhanced Communication and Parenting Intervention (Enhanced Intervention), the Brief Communication and Parenting Intervention (Brief Intervention), and the General Health Intervention (General Intervention). The primary intervention of interest was the Enhanced Intervention, consisting of five 2.5-hour sessions over five weeks and booster sessions at 12 and 24 months. The Brief Intervention condensed the Enhanced Intervention into one 2.5-hour session. Both of these arms taught risk awareness, positive parenting skills, and sexual communication skills. The General Intervention was the control arm, consisting of a single 2.5-hour session. Unlike the Brief and Enhanced Interventions, however, it did not cover sexual risks, positive parenting practices, or how to communicate about sexual topics. Instead, the General Intervention instructed parents on matters of nutrition, exercise, common health conditions among African Americans, behavioral risk factors for these conditions, and tools for behavioral change for both their children and themselves. See Figures A.1-3 in the Appendix for more details on the goals and content of each intervention.

The Enhanced Intervention was designed to be more "hands-on" than the other two interventions. According to Long et al. (2004), teaching tools included "structured learning experiences, discussion, videotapes, overheads, posters, role plays, group exercises, and homework assignments," as well as handouts summarizing each session (2004:52). The Brief Intervention was a less interactive, more didactic version of the Enhanced Intervention. It was included as an intervention arm because many parenting programs conducted by community organizations use a similar single-session format. Also, if analysis demonstrated that the Brief Intervention worked as effectively as the Enhanced Intervention, using the former instead of the latter would save time and money.

Many similarities exist between the Enhanced Intervention and the Brief Intervention, but due to time constraints the material was covered more superficially in the Brief Intervention. Additionally, parents were asked to identify their personal sexual values in the Enhanced Intervention but not in the Brief Intervention. While parents in both interventions learned about the dangers of HIV and unsafe sex in a general way, parents in the Behavioral Intervention did not have the same level of new socialization/experience and they were not encouraged to apply what they learned to their own value systems. I would therefore expect that the Brief Intervention would have less of an impact on parents' lifestyles than the Enhanced Intervention would, as changes in parents' socialization, experiences, and value systems most likely mediate any relationship between their participation in an intervention and changes in the trajectories of their own sexual risk behaviors and health lifestyles.

The General Intervention was the control arm of the study, but its focus on NP behaviors poses a problem for this research if SNAP (smoking, nutrition, alcohol, and

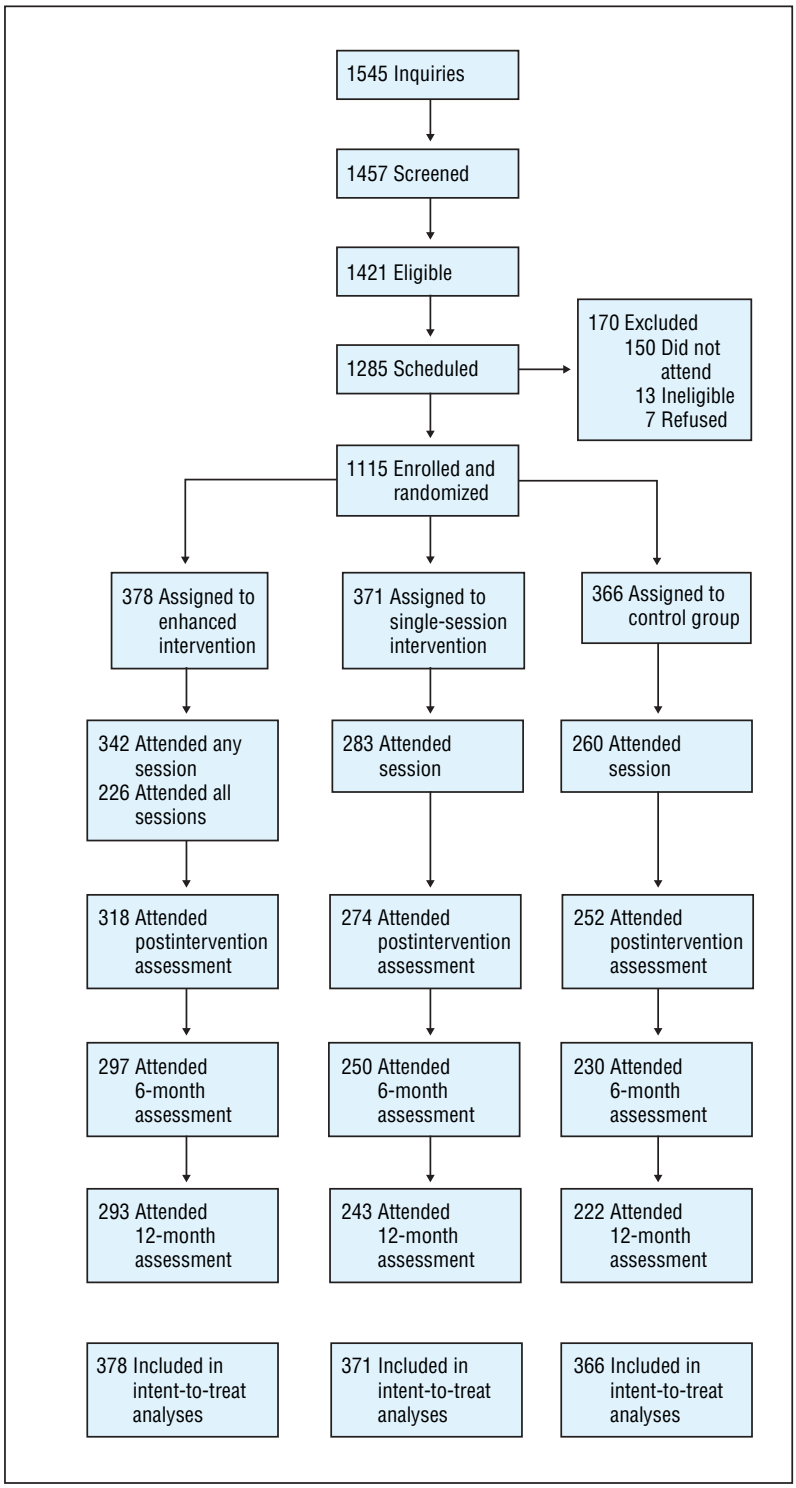
physical activity) and sexual behaviors do in fact group together into a binary good or bad health lifestyle. That is, an intervention targeting sexual behaviors should impact NP behaviors, and likewise an NP intervention should impact sexual behaviors because the lifestyles as a whole will shift toward being healthier or unhealthier. If lifestyles are bidimensional, however, an NP intervention should have little impact on SA and sexual behaviors due to the fact that the NP and SA/sexual behaviors would be most affected through distinct pathways (resources versus socialization, experiences, and risk or protective factors). Although the intervention's NP benefit for parents was considered in the design of the General Intervention, improving parents' health was not a focus of PMP, nor has it been tested in the PMP literature. Regardless of the true nature of health lifestyles, any impact on parents' behaviors (beyond NP behaviors for General Intervention participants) would be a latent function of the intervention (Merton 1957; Berger 1963).

When creating PMP, researchers were aware of the difficulties inherent in designing a culturally relevant, sustainable longitudinal study of African American families. One of the biggest challenges programs like PMP need to overcome is a cultural mistrust of historically white academic and government institutions (Murry et al. 2004). This mistrust is certainly understandable given stories of abuse of black "participants" by white researchers, as with the Tuskegee Syphilis Experiment and the immortal cell line of Henrietta Lacks (Murry et al. 2004; Skloot 2011). While ideally IRB requirements have eliminated these sorts of grievous abuses, gaining trust requires more than just avoiding obvious harm. Research with underlying stereotypes or that uses the norms of one culture to negatively evaluate another does not engender trust, no matter how well intentioned. For instance, Murry et al. (2004) note that existing research tends to view African American families as being in a state of

crisis rather than focusing on the *strengths* that allow African American families to face social problems like poverty, the mass incarceration of African American men, and school failure. Research on parenting practices and sexual risk behavior in particular can overlook important subtleties without a thorough appreciation of a population's cultural, economic, and social context.

In order to address cultural mistrust, PMP designers made a point to include the local African American community in every step of the development process, both to show that the program would benefit the community and to make it culturally relevant. Researchers increased community "buy-in" by incorporating CABs, CLs, and African American facilitators. Researchers also addressed structural, contextual, and communication barriers by having recruitment and intervention sessions take place in local community venues as well as making it easier for families to participate by doing things like offering dinner and providing reimbursements for child care. The program prioritized empirically-supported parenting curricula designed for African American parents rather than relying on parenting programs that use white, middle-class parenting practices as the standard (Ball et al. 2004). Another strategy was to market the program as *supporting* parents in their efforts to produce healthy children rather than patronizing them with a remedial parenting program (Murry et al. 2004). These strategies helped the study designers maintain an admirable retention rate, especially given the three-year duration of the study. Retention analysis showed few differences between those who remained in the study and those who left it (Armistead et al. 2004, see Table 6.2 or Figure A.4 in the Appendix). The following diagram illustrates the retention rates at each phase of the intervention and study:

**Figure 5.1: Flowchart of Dyad Participation at Each Stage of the Parents Matter! Program (Forehand et al. 2007:1126)**



PMP researchers used intent-to-treat analysis[8] and found evidence that the program was efficacious at reducing sexual risk behaviors in preadolescents (Forehand et al. 2007). Despite the innovative and rigorous design of the intervention, there are some limitations to the data, which will be discussed in more detail in Chapter 9. Key limitations include the fact that the intervention data came from a convenience sample of parents who elected to participate in the study. Moreover, the findings are not nationally representative, although they are generalizable to African Americans living in the Southeast. As with any survey about sensitive topics, there is always the possibility that respondents may have under-reported sexual intentions or behaviors, but the fact that the surveys were administered via private computer stations decreased the likelihood of a strong social desirability response bias.

**Measures**

In an effort to ensure the assessment questions were "reliable, valid, sensitive, age appropriate, and culturally relevant" (Ball et al. 2004:26), researchers incorporated questions previously shown to be valid and reliable for parents and school-aged children, especially within the African American community (Ball et al. 2004). CABs reviewed all questions and the questions were pilot tested in focus groups of African American parents of pre-adolescents. Researchers also worked with teachers of African American 4$^{th}$ and 5$^{th}$ graders and verbally administered the questions to children in order to assess readability

[8] Intent-to-treat analysis is a method for avoiding bias and refers to the process of evaluating individuals according to the treatment group to which they were randomly assigned at baseline, regardless of whether they ultimately received a different treatment or were lost to follow-up. For instance, a cancer patient assigned to Treatment A may in fact receive Treatment B (treatment crossover) should he prove allergic to Treatment A, because his life cannot be compromised for the sake of a clinical trial. However, the patient would still be analyzed as belonging to Treatment A in intent-to-treat analysis.

and comprehension. The surveys covered a wide variety of topics, including "demographic information, child characteristics (e.g., problem behavior, competence, physical development), parenting, parent-child communication about sex, attitudes about sex, perceived risk associated with sexual behavior, gender role beliefs, and sexual behavior", as well as questions about nutrition, exercise habits, and satisfaction with the intervention (Ball et al. 2004:27). For more information on the constructs and their sources, see Figures A.5-6 in the Appendix.

One problem for this research stems from the nature of measuring sexual behaviors among preadolescents. Some behaviors, like those involving diet, are simple enough to measure in preadolescents. For instance, it can be objectively determined whether preteens ate *x* many vegetables in the past *y* days. Measuring sexual behaviors in preadolescence, on the other hand, is more complicated because most preteens have not yet begun engaging in those behaviors (and of course that is why preadolescence is the perfect time to begin a pre-risk prevention intervention). To deal with this problem, researchers studying sexual behaviors in preadolescence often measure *attitudes* and *intentions* as proxies for future behavior, in addition to measuring current behaviors. This approach has been validated (Turchik and Gidcyz 2012) and in fact it is the primary way studies that have used this dataset analyzed sexual behaviors (e.g. Forehand et al. 2007).

*Operationalizing Health Lifestyles*

The data allow for four broad domains of variables for children's health lifestyles (nutrition, physical activity, delinquency, and sexual risk), three matching domains for parents' health lifestyles (nutrition, physical activity, and sexual risk), and one additional

domain for parents' health lifestyles (stress) to compensate for missing SA data for parents. The health behavior variables were recoded as binary variables even though the actual survey had at least three response categories for each of the health behavior questions. Using dichotomous variables allowed for a clearer interpretation of low-risk and high-risk health lifestyles. The presence of a given health risk or health-promoting behavior (e.g. eating fruits and vegetables daily or having multiple sexual partners) was coded "2" in SAS and "1" in Stata, while the absence of the behavior was coded "1" in SAS and "0" in Stata.[9] Of course, it is possible to argue that the absence of a health-promoting behavior is itself a risk behavior (and vice versa), but this coding scheme follows popular understandings of health promotion and health risk behaviors while also permitting a more intuitive interpretation of the results. I included 11 health behaviors in the health lifestyles analysis for both children and parents.

The first domain*, nutrition,* consisted of three indicators for children ("I eat lots of fruits and vegetables every day," "I have milk or other dairy foods like cheese or yogurt every day," and "I eat breakfast every day"). Although the data included eight indicators for parents, I only selected three for inclusion due to the processing limitations of LCA and LTA. Using only three variables also mirrored the amount of data gathered on children's nutrition behaviors. The three that I included ("I eat at least five servings of fruit and vegetables a day," "When I prepare my meals I bake, broil, or grill instead of frying," and "I read nutrition labels on food products to help me make choices about what foods to buy") were less subject to dietary fads and misinterpretation than some of the other variables. For instance, eating at least six servings of breads, grains, and cereal every day, one of the

[9] In the remainder of this section I will only refer to SAS coding for simplicity, but the Stata coding followed a similar pattern.

variables I could have selected, might be healthy (e.g. eating brown rice) or unhealthy (e.g. eating Fruity Pebbles). Both children and parents were asked how true the nutrition statements were for them. Children's response options were "never", "sometimes", and "a lot". Parents' response options were "not at all true", " a little true" and "very true". In my recoding of the answers respondents who answered "never/not at all true" or "sometimes/a little true" were coded "1", while those who answered "a lot/very true" were coded "2", with one exception. Because the variable for parent consumption of fruits and vegetables was more demanding than the matching child question (requiring the consumption of at least five servings of fruits and vegetables a day as opposed to eating the vaguer "lots" of fruits and vegetables every day), I recoded parents who answered "not at all true" as "1" and those who answered "a little true" or "very true" as "2".

The second domain, *physical activity,* contained one indicator for children ("I do something active every day like take a walk, play ball, or exercise") and two indicators for parents ("I exercise at least 20 minutes at a time on at least three days a week" and "I take the stairs instead of the elevator when I have the choice to do so"), although I only used the first parent indicator in my analysis to mirror the operationalization of this domain in children. The variables had the same response options as the nutrition questions. Children and parents were both asked about television usage, but the variable asked whether respondents watched an hour or more of television every day. While sedentary behavior was included in several of the studies discussed in the Chapter 2 (e.g. Busch et al. 2013), I did not include television viewing because the other studies only specified television viewing as unhealthy if it lasted for two or more hours a day.

Unfortunately I only had indicators of *delinquency*, the third domain, for children. The first set of questions had "never", "once", "a few times", and "lots of times" as response options and included the following behaviors: drinking beer, wine or liquor; smoking cigarettes or chewing tobacco or snuff; smoking marijuana; and using any other illegal drug or substance to get high. I combined the latter two variables to create a "used any drug" variable. The second set of questions had "not at all true", "a little true", and "very true" as response options and I included two of these questions ("I get into a lot of fights" and "I have been in trouble with the police") in the analysis. Because engaging in delinquency behaviors as a preadolescent portends a different risk behavior trajectory than the trajectories of preadolescents who abstain from those behaviors (Chen and Jacques-Tiura 2014; Wang et al. 2014b), I coded answers of "never tried/not at all true" as "1" and "used once or more/a little or very true" as "2".

I included *stress* as a third domain for parents. Stress may not be thought of as an active health behavior, but it is reflective of the social environment and the mix of resources, risk factors, and protective factors available to an individual. Other studies (e.g. Laska et al. 2009) have included stress-management behaviors in their research on health lifestyles. The experience of stress and perceived self-efficacy to control stress shape and are shaped by the *habitus*, with tangible consequences for health. Concepts like "allostatic load" and "weathering" capture the cumulative effects of stress on the body's regulatory systems, such as the hypothalamic-pituitary-adrenal (HPA) axis (Geronimus et al. 2006; Seeman et al. 2010). Across all age groups and SES levels African Americans have higher allostatic load scores than do whites (Geronimus et al. 2006), which points to the

importance of including stress in an analysis of the health lifestyles of African American parents.

It can also be argued that living with stress truly is an active health behavior because people are not taking steps to manage their stress levels (either because they cannot or do not know how to do so). Moreover, individuals sometimes engage in risk behaviors like smoking and drinking to offset the psychological toll of stress, so to some extent stress can also be viewed as a very rough proxy for SA behaviors. One interesting study found that African Americans who engaged in unhealthy behaviors like smoking and drinking were 29% less likely to experience clinical depression as a result of stress, although stress increased the likelihood of clinical depression by 64% otherwise (Jackson, Knight, and Rafferty 2010). Even "healthy" responses to stress can be damaging to African Americans. For instance, there is some evidence that African Americans who practice "John Henryism" (e.g. working tirelessly to overcome obstacles) to cope with low SES are more susceptible to hypertension than are their peers who do not use this coping mechanism (James et al. 1992). In the PMP survey parents were asked four questions about stress, and I selected "I've been feeling nervous or stressed out" and "I feel I've been able to handle the important things going on in my life" for this analysis so that this domain had a health-harming component (feeling stressed) and a health-promoting one (self-efficacy for handling stress). Responses of "not at all true/a little true" were coded "1" and "very true" was coded as "2".

The final domain was *sexual behaviors*. The PMP survey covered many sexual values, behaviors, and intentions, but I settled on two indicators that were asked of all children since several variables followed a skip pattern and were therefore missing for many children. The first indicator I selected combined responses to two questions ("Have you

ever willingly let a boy/girlfriend put his/her hands under your clothes?" and "Have you ever willingly put your hands under a boy/girlfriend's clothes?"), such that those who said they had either touched or been touched under clothing were coded "2", and those who had not were coded "1". It should be noted that the survey defined "willingly" for respondents in order to avoid including cases of sexual abuse or assault: "Willingly means you gave permission or said it was OK. It also means you did it because you wanted to, and not because someone made you do it" (Parents Matter Participant Assessment Codebook 2007:22-3). While all respondents were also asked about more advanced sexual behaviors like undressing, touching "private parts", and oral sex, these behaviors were less common. Additionally, touching under the clothing seemed sufficient for capturing a pre-sexual behavior that, when practiced by 9-12-year-olds, likely increased the probability of early sexual debut. I selected a protective attitude as the second indicator for children ("I think I should wait until I am older to have sex"). Those who responded "not at all true/a little true" were coded "1" and those who responded "very true" were coded "2".

I included a number of sexual variables for parents due to the difficulty of capturing sexual risk for people at a variety of stages in life. Any 9-12 year old who is touching or being touched by someone else under their clothing is exhibiting precocious sexual behavior, but sexual health behaviors like using condoms and birth control may be less relevant for adults in long-term relationships yet still critical for those who are single. To address this problem, I included three variables about parents' current sexual behaviors (having multiple sexual partners, not using birth control, and not using condoms) and two variables about parents' attitudes toward safe sex for teenagers ("It's important that teens know how to get and use birth control before they begin to have sex," and "It's important

that teens know how to get and use a condom before they begin to have sex"). For the first variable, number of sexual partners, parents responded to the question, "How many different sex partners have you had in the last year/six months?" Parents were asked about the previous year at baseline, they were not asked the question immediately post-intervention, and they were asked about the previous six months at subsequent follow-ups. The question initially called for an open numerical response, but I recoded the data "1" for 0-1 partners and "2" for 2 or more partners, following Vasilenko and Lanza's (2014) example as a cut-off point for risk.

To determine high-risk birth control use, individuals who did not use birth control the last time they had sex were coded "2", but individuals were coded as low-risk if they did use birth control, were women age 50 or older (due to menopause), or were trying to get pregnant (a variable not available at baseline). It may seem odd to describe not using birth control as a "high-risk" behavior, especially for people in committed relationships, but about half of pregnancies in the US are unplanned (Finer and Zolna 2011). While "risk" in this case should be thought of as risk of an unplanned pregnancy rather than the sort of health risk posed by having multiple sexual partners, not using birth control while sexually active is still an important sexual health behavior worth analyzing. Individuals who did not report having a steady partner, cohabiting, or being married and also did not use a condom the last time they had sex were coded as engaging in high-risk condom use ("2"). For both birth control and condom use there is the possibility that some individuals may not have had sex between survey administration dates, and therefore their report of using or not using birth control and condoms at last sex may overlap with their answers from the previous time point. However, assuming that individuals who did not have sex during a given time frame

would otherwise have used birth control and condoms by coding them "1" would also have been problematic.

Over 80% of parents reported being in some form of a steady relationship, so relatively few respondents had multiple sexual partners or engaged in high-risk condom use. Attitudes about safe sex provide insight into how these parents might have behaved in the absence of a steady relationship, and these attitudes likely also influenced the values about sex that parents communicated to their children intentionally or unintentionally, even if the parents' current sexual health behaviors did not put them at risk. If parents thought it was "not at all true" or only "a little true" that teenagers who have sex should know how to use condoms and birth control they were coded "1", while those who thought it was "very true" were coded "2". A higher value for these variables thus indicates a healthier perspective on sexual risk reduction behaviors and suggests that parents would practice safer sex if they were no longer in a steady relationship.

*Sexual Health Behavior Outcomes*

There were a variety of sexual health behaviors to choose from as outcomes for children, but I selected touching "private parts" and the likelihood of having sex in the next year as the two variables to include in this analysis. The former variable is an escalation of touching or being touched under clothing and therefore an indicator of moving closer to sexual initiation. Respondents were asked, "Have you ever willingly touched a boy/girlfriend's private parts or let a boy/girlfriend touch your private parts?" Affirmative answers were coded "1" and negative responses were coded "0".

Previous research on the PMP data used children's perceived likelihood of having sex in the next year as a focal outcome (Forehand et al. 2007), so it is a primary outcome of interest in this analysis as well. To operationalize this variable, children were asked about their intentions to have sex: "How likely is it that you will or will not have sex in the next year?" Those who answered, "I am sure I won't have sex in the next year" or "I probably won't have sex in the next year" were coded "0" and those who answered, "There's an even chance that I will or will not have sex in the next year," "I probably will have sex in the next year," or "I'm sure that I will have sex in the next year" were coded "1", following the PMP literature (Forehand et al. 2007). Unfortunately there were no additional variables to include as sexual behavior outcomes for parents, so I selected having multiple sexual partners and engaging in high-risk birth control use at the three-year follow-up as the outcomes of interest. This lack of additional future behaviors to examine is to be expected because adults are not developing new sexual behaviors, unlike preadolescents, who are moving from precontemplation to sexual initiation (Butler et al. 2006).

*Covariates*

The covariates spanned upstream determinants, downstream risk and protective factors, and potential confounders. Sociodemographic variables included family income per month (<$500, $500-999, $1,000-1,999, and $2,000+), parent education (no high school, high school/GED, some college, AA/technical degree, college degree or higher), parent employment (other, part-time, or full-time), and marital status/family structure (no steady partner, steady partner, cohabiting, or married). Parent and child gender (coded male = "0" and female = "1"), parent age (top-coded at 60 to reduce the influence of outliers), child

age, child grade (4th grade or 5th grade at baseline, but updated at each time point), parent report of frequency of family religious attendance (never or a few times a year, once or twice a month, once a week or more), and participating parent/guardian's relationship to the target child (biological/adoptive parent or other) were also included. Age squared was included in preliminary analysis for both parents and children, but the effect was either insignificant or minimal (e.g. a coefficient of less than .008), so for the sake of parsimony quadratic values were not included in the analysis. The intervention arm (Enhanced, Brief, and General) and site (Athens, Atlanta, and Little Rock) were included as controls for both parents and children. Parent and child race were included in the descriptive statistics table but not in the analysis because only parents who identified as African American were eligible for the intervention. Very few of the children identified as non-black and the variable was not significant when included in preliminary analysis.

I also incorporated a series of variables that operate as risk and protective factors and reflect the influence of the *habitus*. These may serve as mediators through which the interventions shaped health behaviors and health lifestyles. Children and parents were asked about several components of the parent-child relationship, including their perceptions of the levels of parental monitoring (an index of four questions about knowing where a child is, what he/she does, who he/she is with, and when he/she will be home), relationship quality (an index of 21 questions for parents and 11 questions for children such as "Target child and I spend a lot of time together" and "My parent shows me that s/he loves me"), parent-child communication (an index of 14 questions about whether dyads have discussed SNAP and sexual health topics like exercising, drinking alcohol, dating, and using birth control), and parental responsiveness to sexual topics (an index of 17 questions

for parents and six questions for children, such as “If my son/daughter asked me a question about a sex topic, I would get mad or angry” and “I would be comfortable asking my parents a question [about sex]”). The number of questions in each index was not always identical because of the structure of the survey data (children and parents were sometimes asked a different number of questions) and an effort to find the most valid scale for child and parent populations. The indices had the following Cronbach’s alphas: child perception of parental monitoring (.7948), parent perception of parental monitoring (.8101), child perception of relationship quality (.7292), parent perception of relationship quality (.8998), child perception of parent-child communication (.8905), parent perception of parent-child communication (.9000), child perception of parental responsiveness to sexual topics (.7063), and parent perception of parental responsiveness to sexual topics (.8072).

Some questions were asked only of children: believing he or she is good at schoolwork (“not at all true/a little true” was coded “0” and “very true” was coded “1”), feeling happy in the past month (“Pick the one face that best describes how happy you’ve been feeling most of the time in the past month”, coded “0” for an unhappy or neutral face and “1” for a happy face), child perception of how many peers have had sex (collapsed into three categories of “none”, “only a few”, and “about half/most or all”), parent belief in abstinence until marriage to gauge the strictness of objective family norms about sex (with response options of “not at all true”, “a little true”, and “very true”), and child perception that his/her parent believes he/she should wait until he/she is older to have sex as a proxy for children’s subjective perception of family norms (coded “0” for “not at all true/a little true” and “1” for “very true”).

Parent-specific questions included importance of religious beliefs (coded "0" for "not at all/slightly/moderately important" and "1" for "very important" because the vast majority of parents felt that religion was very important), age at first sex (originally a numeric variable but recoded as ≤ 12, 13-15, 16-17, or 18+), condom use at first sex and birth control use at first sex (both coded "0" for "no" and "1" for "yes"), whether the parent was a teen parent (per Mollborn et al. 2014), and believing it is his/her job to teach his/her child about sex (coded "0" for "not at all true/a little true" and "1" for "very true").

**Statistical Analysis**

This dissertation seeks to answer several questions, so it will be easier to explain the analytic strategy for each broad topic separately. However, a methodological question underlying all health lifestyles research must first be considered before describing the analytic strategies. In the previous chapter I mentioned that Abel (1991) sought to create an operationalizable definition of health lifestyles. Abel also delved into concerns about the empirical and theoretical validity of research on health lifestyles. He lamented findings that lacked empirical validity due to external and internal inconsistencies stemming from the use of indices to measure health lifestyles. While Abel agrees that assessing health lifestyles requires more than analyzing variables independently, he argues that it also demands a particular type of analysis of the relationships between behaviors. Relying on a simple index of health variables can result in individuals with very diverse health behaviors receiving the same index score. This leads to *external* inconsistency when sociodemographic categories predict individual behaviors better than indexed behaviors do. For instance, Abel cites a study from Hayes and Ross (1987) in which the authors found that young people and older

people could receive similar health index scores, such that individual behaviors like eating and exercise varied by age rather than by index score. An index can also result in internal inconsistency due to the fact that beneficial health behaviors are not necessarily positively correlated solely with other beneficial health behaviors. As an example, in the empirical section of his article Abel found that higher rates of sports and exercise participation were directly correlated with higher levels of alcohol consumption instead of inversely correlated as one might expect. Reliance on a single index of health variables misses such nuances.

How, then, does Abel suggest one ought to measure the relationship between behaviors in health lifestyles? The answer is exploratory factor analysis. The benefit of exploratory factor analysis is that it does not assume a given relationship between health behaviors. Rather, it allows that relationship to emerge organically, and it also permits researchers to discover multiple patterns of behaviors (i.e. lifestyles) in the data. This approach to understanding health lifestyles is reminiscent of grounded theory in qualitative methods, which does not impose a theoretical perspective on the data but rather allows a theory to arise through inductive analysis. Developing a grounded theory is an iterative process, requiring qualitative researchers to constantly reexamine their theoretical framework as they collect more data. Likewise, developing substantive categories of health lifestyles should be an iterative process, except in this case the categories of health lifestyles should emerge through repeated analyses on a variety of populations in an effort to ascertain patterns of patterns in health behaviors. Exploratory factor analysis has indeed become a popular form of assessing health lifestyles. Latent class analysis (LCA), a statistical technique that identifies actual groups of individuals in the data who share particular behaviors, is also frequently used in the health lifestyles literature (e.g. Laska et al. 2009;

Mollborn et al. 2014) and addresses Abel's concerns regarding empirical validity. Latent transition analysis (LTA), the longitudinal equivalent of LCA, has also been used to study health lifestyles (e.g. Monshouwer et al. 2012) and to assess the impact of family-based interventions (Connell et al. 2008).

Abel's second concern, theoretical validity, requires an additional level of analysis. Much health lifestyles research, Abel notes, has focused on the varieties of health lifestyles, but a theory of health lifestyles assumes that health lifestyles vary by sociodemographic variables. Research that does not take the next step of examining whether distinct lifestyles do, in fact, pick out different groups of people is thus incomplete. He suggests that performing cluster analysis after exploratory factor analysis allows research on health lifestyles to be empirically and theoretically valid, but arguably any secondary analysis of the association between sociodemographic characteristics, lifestyles, and outcomes should be sufficient to satisfy Abel's requirement for theoretical validity.

Similarly, Hofstetter et al. (2014) recently wrote an article seeking to establish "best practices" in the literature for analyzing the co-occurrence of risk behaviors. They advocate the use of exploratory factor analysis to see if latent variables unite an assortment of health risk behaviors and cluster analysis to locate actual groups of individuals with similar behavior patterns. This two-step analysis allows researchers to locate individuals with similar lifestyles in order to identify other characteristics shared by the group members. In a review of the methods used to analyze multiple health behaviors, McAloney et al. (2013) note that the majority of researchers use simple measurements to examine the co-occurrence between behaviors, although more researchers are adopting advanced statistical techniques like cluster analysis and latent class analysis. This dissertation uses

LCA, LTA, and regression analysis to follow Abel's recommendations for empirical and theoretical validity.

Turning now to the actual analytic methods used in this dissertation, the descriptive statistics are presented by intervention group (Enhanced, Brief, and General). A retention analysis was performed to test for differences between those who remained in the study at the final time point (three-year follow-up) and those lost to follow-up. Differences between the groups were assessed using ANOVA and the F-statistic for continuous variables and contingency tables and the chi-square statistic for categorical variables. In the following section I will first reprint the overarching topics and research questions subsumed by them and then discuss the analysis used to address each question for the particular topic under consideration.

**Topic 1: Reconsidering Health Lifestyles**

*Question 1:* Do sexual risk behaviors, intentions, and attitudes share a health lifestyle in common with generally studied health behaviors like exercise, nutrition, smoking, and alcohol habits in preadolescents and adults?

*Question 2:* What social factors are associated with preadolescents' and adults' health lifestyles?

*Question 3:* Are baseline health lifestyles associated with future sexual health behaviors, such as perceived odds of having sex within the next year (for preadolescents) and number of sexual partners (for adults)?

To initially determine how health behaviors combine into health lifestyles (*Question 1*), I used a correlation matrix to assess the presence of relationships between the health behaviors at baseline. Once an association between the behaviors was established, I performed LCA to identify groups of people in the data who shared classes, which are empirically observed patterns of behaviors that identify unique health lifestyles. The PROC LCA latent class analysis procedure macro in SAS (Lanza et al. 2007; Lanza et al. 2015; PROC LCA & PROC LTA 2015) was used to run the analysis and identify the optimal number of latent classes for children and parents at baseline. Two-class through six-class solutions were tested, and the best model fit was determined by which solution averaged the smallest Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), Bayesian Information Criterion adjusted for sample size (BIC*), and Consistent AIC (CAIC) scores to balance the tendency of AIC statistics to overestimate the number of classes and BIC statistics to underestimate them (Laska et al. 2009) in an attempt to weight model fit and parsimony equally (Lanza and Rhoades 2013).

Item-response probabilities indicated how likely members of each class were to engage in a particular health behavior. These item-response probabilities are the mean level of participation for each class. An interpretation of a hypothetical item-response probability of .80 for smoking for Class X would be that the members of that class had a .80 probability of smoking, which can also be interpreted to mean that 80% of them smoked. Item-response probabilities allow for comparisons in the level of behaviors across classes. For both children and parents the distinctions between latent classes were depicted in a series of graphs that compared the likelihood of engaging in certain health behaviors over time (fully adjusted for all static and time-varying covariates) by the best-fitting baseline

latent class. Class fit was confirmed by examining the average probability for each best-fitting latent class, where "1" is a perfect fit and no indication of potential membership in other classes. For children the average probability was .86 for Class 1, .87 for Class 2, .86 for Class 3, and .78 for Class 4, while for parents the average probability was .80 for Class 1, .94 for Class 2, .81 for Class 3, and .85 for Class 4.

I used multinomial logistic regression in Stata to examine associations between social factors and health lifestyles (*Question 2*), reporting the unadjusted and adjusted risk ratios with the healthiest class as the reference category. The odds of individuals from different latent classes engaging in future sexual health behaviors (*Question 3*) were determined by using unadjusted and adjusted logistic regression models comparing the likelihood of engaging in behaviors at baseline, one-year follow-up, and three-year follow-up. For children, graphs plotting the estimated likelihood of engaging in a behavior over time (using a predicted value fully adjusted for all static and time-varying covariates) by baseline latent class illustrated the effect of baseline latent class on future behaviors. For this question and all other longitudinal questions the post-intervention time point was excluded from analysis due to the fact that many of the variables were not included in that time point's survey.

**Topic 2: Understanding the Development and Transmission of Health Lifestyles**

*Question 4:* Do preadolescents and adults maintain one health lifestyle or does that lifestyle change over time?

*Question 5:* Does a relationship exist between parents' and children's health lifestyles over time?

*Question 6:* What role do socioeconomic status (SES), parents, peers, and other social factors play in the intergenerational transmission of health lifestyles?

Just as I used LCA to identify latent classes at baseline, I used latent transition analysis (LTA) to discern latent statuses over time and the probability of transitioning from one status to another (*Question 4*), using a PROC LTA macro in SAS (Lanza et al. 2015; PROC LCA & PROC LTA 2015).[10] To clarify, classes (LCA) are a cross-sectional approach to identifying health lifestyles, while statuses (LTA) provide a longitudinal classification of health lifestyles. The concepts themselves are essentially the same, but the terms "class" and "status" are used to indicate the analytical technique (LCA versus LTA) and the fluidity of statuses over time.

Once more two-status through six-status solutions were tested, although only log-likelihood fit statistics were available in the LTA procedure due to the complexity of the model. The LTA procedure was run on both the population as a whole and again using the intervention arm as a grouping variable during preliminary analysis. Intervention membership likely shaped the development of future statuses, because ideally participating in an intervention caused people to embrace healthier lifestyles over time than they might have otherwise. Although the General Intervention was the control arm of the actual intervention, it still likely affected the development of health-promoting aspects of health

[10] Given that LTA provides statuses at baseline and (as will be seen in Chapter 7) LCA classes and LTA statuses were nearly identical in this study, it may be asked why I did not simply use LTA for the Topic 1 questions as well. While that would have been possible, LCA is preferable for the cross-sectional questions asked in Topic 1 for three reasons. First, it is the standard methodology used in similar articles. Second, LCA analysis of baseline data avoids any intervention effects, unlike with LTA. Third, LCA analysis of baseline data is run on a complete dataset without averaged values substituted for missing data, which is not the case for LTA.

lifestyles (such as exercising and eating healthy) and thus it is not an adequate control in this analysis. Analyzing all groups as a whole and then subsequently controlling for the intervention arm in regression analysis seemed to be the best option, allowing for direct comparisons of how effective the interventions were in helping children and their parents achieve or maintain healthy lifestyles. Baseline and three-year follow-up item-response probabilities were reported for each status to demonstrate the relative stability of each status across the time points.

To evaluate the relationship between children's and parents' lifestyles over time (*Question 5*) I ran several longitudinal random effects model regressions with maximum likelihood estimation in Stata, using each dyad's participant ID number as the grouping variable. The Bruesch-Pagan Lagrange multiplier (LM test) provided support for using a random effects model over ordinary least squares (OLS) regression. The Hausman test suggested that a fixed effects model would be preferable, but the Hausman test is not always reliable (Dieleman and Templin 2014) and a random effects model allows for the inclusion of time-invariant variables of interest and group-level variables. I first performed an unadjusted analysis testing the association between each status and all population-specific covariates, including the best-fitting baseline latent class and status membership probabilities for the other half of the dyad. The association between parent and child health lifestyle statuses over time was then estimated, controlling for intervention group and site. For children, supplemental graphs illustrated the probability of status membership at each time point by parent baseline latent class. In order to evaluate the effect of SES, parents, peers, and other social factors on the intergenerational transmission of health

lifestyles (*Question 6*), I added the full set of population-specific covariates to the random effects model from Question 5.

**Topic 3: Intervening in Health Lifestyles**

*Question 7:* Do parent-based interventions impact the general and sexual health behaviors of children and their parents?

*Question 8:* Do parent-based interventions alter the health lifestyles of children and their parents?

*Question 9:* Do parent-based interventions affect the intergenerational transmission of health lifestyles?

I evaluated the impact of the three intervention arms on general and sexual health behaviors (*Question 7*) by first using logistic regression at each follow-up time point to predict the likelihood of engaging in a given behavior (adjusted for all population-specific static and time-varying covariates). This estimate was then compared across intervention groups using ANOVA. Pairwise comparisons using Tukey's Honestly Significant Difference (HSD), which is essentially a *t*-test that corrects for multiple comparisons, then identified differences between sets of intervention pairs. In order to determine the effect of the interventions on health lifestyles (*Question 8*), I stratified the probability of status membership at baseline and three-year follow-up for each status by intervention. ANOVA showed significant differences in some health lifestyle statuses at baseline between intervention groups[11], so I created a variable that calculated the change in the probability of

[11] These significant differences at baseline would ordinarily suggest that randomization was not effective. However, significant differences at baseline are to be expected in this case, since statuses are shaped by their

status membership from baseline to each follow-up point rather than measuring the absolute probability of membership at each time point. This allowed me to avoid finding significant differences between the intervention groups only because there was a significant difference before the intervention even began. This analytic strategy also better reflects the original question because it evaluates the ability of interventions to improve lifestyles while also determining whether effects decrease over time. I used the new variable to run ANOVAs to test for significant differences in the change in status membership probabilities between the three interventions, subsequently following this analysis with pairwise comparisons using Tukey's HSD to further identify any notable effects of the interventions.

Another option for answering Question 8 would have been to compare the grouped LTA transition probabilities, but assessing change in the probability of status membership at the individual-level data allowed for the exclusion of missing cases at each time point. Missing data is a worthwhile concern since PROC LTA runs in spite of gaps in the data and provides status membership estimates even for missing cases lost to follow-up. While these estimates are dropped in regression analysis because those cases are missing other data, the estimates would have remained for the ANOVAs and pairwise comparisons. I excluded these cases so that the findings would be based on status probability membership values determined by actual health behaviors at that time point rather than by averaged values for missing data. While this step may not have been necessary, the sample size was large enough to err on the side of caution by omitting them.

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development over time. Thus, the differences at baseline may be more reflective of the efficacy of certain interventions over time rather than due to a failure of randomization, particularly since there is no other reason to believe that randomization failed. See Table A.1 in the Appendix for more details.

Lastly, to fully evaluate the effect of interventions on the intergenerational transmission of health lifestyles (*Question 9*) interactions between the intervention, parenting practices, and the other half of the dyad's status membership probabilities were added to the random effects model in Question 6. In this and other regression models a Bonferroni correction may have been useful due to the larger number of variables in some analyses. However, the Bonferroni correction can be unnecessarily conservative, a drawback for this analysis given the exploratory nature of the questions I am asking. Concerns about significant findings in lengthy regression models can be addressed by focusing on findings that are significant at the $p < .000$ level.

It is clear that this dissertation uses a wide array of statistical techniques to better understand the composition of health lifestyles as well as how they are transmitted between parents and children and how public health officials can effectively intervene in that transmission. In the remainder of this dissertation I will present my findings for each overarching research topic (Topic 1 in Chapter 6, Topic 2 in Chapter 7, and Topic 3 in Chapter 8) before concluding with a discussion about how these findings contribute to sociology and public health in Chapter 9.

# Chapter 6: Results—Reconsidering Health Lifestyles

This chapter is the first of three results chapters. Chapter 6 concerns Topic 1, Chapter 7 covers Topic 2, and Chapter 8 presents the results for Topic 3. I will begin this chapter by discussing the descriptive statistics and retention analysis before addressing each of the questions contained in Topic 1. In this chapter and the subsequent results chapters I will first present the tables and/or figures (sometimes several in a row) before commenting on them in detail.

## Descriptive Statistics

Table 6.1 contains the descriptive statistics for children and parents, stratified by intervention group

**Table 6.1: Descriptive Statistics at Baseline by Intervention (Parents Matter! Data, 2001-2006)**

| Variable | Brief Intervention (N = 371 Dyads[1]) % or Mean (SD) | Enhanced Intervention (N = 378 Dyads[1]) % or Mean (SD) | General Intervention (N = 366 Dyads[1]) % or Mean (SD) | p-value[2] |
|---|---|---|---|---|
| *Demographic Data* | | | | |
| Child gender | | | | |
| Male | 44.57 | 44.77 | 44.77 | .743 |
| Female | 55.43 | 55.23 | 55.23 | |
| Child age | 10.14 (.84) | 10.04 (.81) | 10.06 (.77) | .295 |
| Child grade | | | | |
| 4th | 43.21 | 49.33 | 45.18 | .252 |
| 5th | 56.79 | 50.67 | 54.82 | |
| Child race | | | | |
| Other | 5.16 | 4.56 | 3.31 | .654 |
| Black | 94.84 | 95.44 | 96.69 | |
| Parent gender | | | | |
| Male | 2.98 | 3.71 | 2.47 | .800 |
| Female | 97.02 | 96.29 | 97.53 | |
| Parent age[3] | 36.70 (8.23) | 35.45 (7.72) | 36.07 (8.07) | .460 |
| Parent race | | | | |
| Other | 0 | 0 | 0 | --- |
| Black | 100 | 100 | 100 | |
| Parent relationship to child | | | | |
| Other | 9.76 | 9.28 | 10.99 | .862 |
| Parent[4] | 90.24 | 90.72 | 89.01 | |
| Parent education | | | | |
| < High school diploma | 25.00 | 22.02 | 25.90 | .464 |

| | | | | |
|---|---|---|---|---|
| High school diploma or GED | 25.54 | 32.89 | 29.75 | |
| Some college | 23.91 | 18.57 | 20.94 | |
| AA/technical degree | 13.04 | 13.53 | 12.40 | |
| College degree or higher | 12.50 | 13.00 | 11.02 | |
| Parent employment | | | | |
| Other | 41.30 | 38.56 | 39.12 | .518 |
| Part-time | 12.23 | 10.64 | 8.82 | |
| Full-time | 46.47 | 50.80 | 52.07 | |
| Monthly family income | | | | |
| $0-499 | 17.48 | 22.91 | 15.92 | .144 |
| $500-999 | 21.20 | 18.87 | 24.58 | |
| $1000-1999 | 30.66 | 30.19 | 28.21 | |
| $2000+ | 30.66 | 28.03 | 31.28 | |
| Family structure | | | | |
| No steady partner | 18.42 | 15.99 | 15.96 | .940 |
| Steady partner | 24.67 | 24.14 | 26.71 | |
| Cohabiting | 12.17 | 15.05 | 12.70 | |
| Married | 44.74 | 44.83 | 44.63 | |
| Family religious attendance | | | | |
| Never or a few times a year | 24.52 | 27.06 | 27.62 | .172 |
| Once or twice a month | 23.16 | 18.83 | 14.92 | |
| Once a week or more | 52.32 | 54.11 | 57.46 | |
| Intervention site | | | | |
| Athens | 29.00 | 28.38 | 28.55 | .846 |
| Atlanta | 29.00 | 28.65 | 29.95 | |
| Little Rock | 42.01 | 42.97 | 41.21 | |
| | | | | |
| *Parenting Practices* | | | | |
| Child perception of parental monitoring[5] | 3.16 (.83) | 3.22 (.82) | 3.26 (.80) | .300 |
| Parent perception of parental monitoring[5] | 3.50 (.55) | 3.54 (.52) | 3.51 (.55) | .694 |
| Child perception of relationship | 2.65 | 2.68 | 2.65 | .335 |

| | | | | |
|---|---|---|---|---|
| quality[6] | (.31) | (.27) | (.31) | |
| Parent perception of relationship quality[6] | 2.54 (.33) | 2.55 (.31) | 2.58 (.30) | .368 |
| Child perception of parent-child communication[7] | 2.19 (.51) | 2.18 (.53) | 2.20 (.53) | .722 |
| Parent perception of parent-child communication[7] | 2.24 (.52) | 2.25 (.50) | 2.30 (.50) | .280 |
| Child perception of parental responsiveness[8] | 1.54 (.32) | 1.53 (.30) | 1.55 (.31) | .688 |
| Parent perception of parental responsiveness[8] | 2.33 (.33) | 2.33 (.30) | 2.34 (.30) | .912 |
| *Child-Specific Variables* | | | | |
| Believes he/she does well on schoolwork | | | | |
| Not at all true or a little true | 41.85 | 44.77 | 41.32 | .617 |
| Very true | 58.15 | 55.23 | 58.68 | |
| Happiness in the past month | | | | |
| Unhappy or neutral | 12.23 | 15.01 | 16.80 | .350 |
| Happy | 87.77 | 84.99 | 83.20 | |
| Perception of how many peers have had sex | | | | |
| None | 64.03 | 66.31 | 63.99 | .028 |
| Only a few | 19.07 | 22.64 | 25.48 | |
| About half or more | 16.89 | 11.05 | 10.53 | |
| Parent believes people should not have sex before marriage | | | | |
| Not at all true | 18.90 | 19.57 | 21.05 | .459 |
| A little true | 29.86 | 33.24 | 34.63 | |
| Very true | 51.23 | 47.18 | 44.32 | |
| Child believes parent thinks he/she should wait until he/she is older to have sex | | | | |

| | | | | |
|---|---|---|---|---|
| Not at all or a little true | 14.17 | 13.75 | 16.07 | .786 |
| Very true | 85.83 | 86.25 | 83.93 | |
| | | | | |
| *Parent-Specific Variables* | | | | |
| Age at first sex | | | | |
| ≤12 | 5.76 | 5.19 | 5.13 | .091 |
| 13-15 | 40.35 | 31.69 | 35.61 | |
| 16-17 | 35.16 | 35.25 | 38.18 | |
| 18+ | 18.73 | 27.87 | 21.08 | |
| Condom use at first sex | | | | |
| No | 63.89 | 53.74 | 55.15 | .016 |
| Yes | 36.11 | 46.26 | 44.85 | |
| Birth control at first sex | | | | |
| No | 67.60 | 64.97 | 60.06 | .095 |
| Yes | 32.40 | 35.03 | 39.94 | |
| Parent was a teen parent | | | | |
| No | 71.88 | 74.53 | 72.00 | .755 |
| Yes | 28.12 | 25.47 | 28.00 | |
| Believes it's his/her job to teach child about sex | | | | |
| Not at all true or a little true | 11.23 | 9.87 | 7.97 | .503 |
| Very true | 88.77 | 90.13 | 92.03 | |
| Importance of religion | | | | |
| Not at all/slightly/moderately | 16.53 | 16.18 | 15.70 | .153 |
| Very important | 83.47 | 83.82 | 84.30 | |
| | | | | |
| *Child Health Behaviors* | | | | |
| Eats fruits and vegetables daily | | | | |
| Never or sometimes | 73.57 | 69.35 | 68.70 | .410 |
| A lot | 26.43 | 30.65 | 31.30 | |
| Consumes dairy products daily | | | | |
| Never or sometimes | 68.12 | 70.43 | 63.71 | .225 |
| A lot | 31.88 | 29.57 | 36.29 | |

| | | | | |
|---|---|---|---|---|
| Eats breakfast daily | | | | |
| Never or sometimes | 47.14 | 48.12 | 44.04 | .533 |
| A lot | 52.86 | 51.88 | 55.96 | |
| Gets physical activity daily | | | | |
| Never or sometimes | 35.69 | 39.78 | 36.01 | .344 |
| A lot | 64.31 | 60.22 | 63.99 | |
| Drinks alcohol | | | | |
| Never tried | 82.34 | 81.50 | 81.82 | .958 |
| Consumed once or more | 17.66 | 18.50 | 18.18 | |
| Uses tobacco | | | | |
| Never tried | 92.66 | 94.37 | 92.56 | .734 |
| Used once or more | 7.34 | 5.63 | 7.44 | |
| Uses drugs | | | | |
| Never tried | 98.91 | 98.12 | 98.07 | .792 |
| Used once or more | 1.09 | 1.88 | 1.93 | |
| Fights | | | | |
| Not at all true | 65.22 | 69.44 | 66.39 | .555 |
| A little or very true | 34.78 | 30.56 | 33.61 | |
| Gets into trouble with the police | | | | |
| Not at all true | 89.67 | 90.62 | 85.95 | .203 |
| A little or very true | 10.33 | 9.38 | 14.05 | |
| Has willingly touched or been touched under clothing by a boyfriend or girlfriend | | | | |
| No | 92.37 | 94.35 | 91.46 | .479 |
| Yes | 7.63 | 5.65 | 8.54 | |
| Believes he/she should wait until older to have sex | | | | |
| Not at all or a little true | 19.89 | 19.14 | 20.22 | .942 |
| Very true | 80.11 | 80.86 | 79.78 | |
| | | | | |
| *Parent Health Behaviors* | | | | |
| Easts at least five fruits and | | | | |

| | | | | |
|---|---|---|---|---|
| vegetables a day[9] | | | | |
| Not at all | 45.08 | 51.07 | 44.75 | .199 |
| A little true/very true | 54.92 | 48.93 | 55.25 | |
| Reads nutrition labels | | | | |
| Not at all/a little true | 71.51 | 82.26 | 76.52 | .006 |
| Very true | 28.49 | 17.74 | 23.48 | |
| Bakes, broils, or grills instead of frying | | | | |
| Not at all/a little true | 73.22 | 75.87 | 72.10 | .238 |
| Very true | 26.78 | 24.13 | 27.90 | |
| Exercises for at least 20 minutes a day three times a week | | | | |
| Not at all/a little true | 81.37 | 81.99 | 83.43 | .160 |
| Very true | 18.63 | 18.01 | 16.57 | |
| Number of sexual partners in the past six months | | | | |
| 0-1 | 94.52 | 94.72 | 93.04 | .772 |
| 2 or more | 5.48 | 5.28 | 6.96 | |
| High-risk birth control use[10] | | | | |
| No | 52.21 | 49.06 | 48.87 | .569 |
| Yes | 47.79 | 50.94 | 51.13 | |
| High-risk condom use[11] | | | | |
| No | 90.70 | 92.79 | 93.79 | .523 |
| Yes | 9.30 | 7.21 | 6.21 | |
| Feeling nervous/stressed | | | | |
| Not at all true/a little true | 76.02 | 73.47 | 72.25 | .238 |
| Very true | 23.98 | 26.53 | 27.75 | |
| Able to handle life events | | | | |
| Not at all true/a little true | 42.55 | 33.42 | 38.19 | .065 |
| Very true | 57.45 | 66.58 | 61.81 | |
| Believes teens should know how to use birth control before having sex | | | | |

| | | | | |
|---|---|---|---|---|
| Not at all true/a little true | 5.21 | 4.04 | 1.67 | .080 |
| Very true | 94.79 | 95.96 | 98.33 | |
| Believes teens should know how to use condoms before having sex | | | | |
| Not at all true/a little true | 3.02 | 3.49 | 1.39 | .324 |
| Very true | 96.98 | 96.51 | 98.61 | |
| *Child Sexual Behavior Outcomes* | | | | |
| Perceived likelihood of having sex in the next year | | | | |
| Less than an even chance | 93.19 | 94.86 | 91.16 | .263 |
| Even chance or greater | 6.81 | 5.14 | 8.84 | |
| Has willingly touched boyfriend or girlfriend's "private parts" or willingly been touched there | | | | |
| No | 95.64 | 98.12 | 97.52 | .219 |
| Yes | 4.36 | 1.88 | 2.48 | |

[1] This is the number of complete dyads, but there are also 4 extra children and 6 extra parents at baseline (included in this analysis), for a total N of 1,115 at baseline. Listwise deletion was not required due to the ability of latent class analysis and latent transition analysis to handle missing variables, so not all respondents answered each of the variables listed in the table.

[2] Continuous variables were tested for significance using ANOVA/F-statistic and categorical variables were tested for significance using contingency tables and the chi-square statistic.

[3] Age originally ranged from 22-89, so it has been top-coded at 60 to reduce skewness.

[4] "Parent" includes biological, adoptive, and step-parents.

[5] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.

[6] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.

[7] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.

[8] Parental responsiveness, ranging from 1-2 for children and 1-3 for parents, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

[9] Parent consumption of fruits and vegetables is coded 1 = not at all, 2 = a little true/very true, which is different than the other nutrition- and exercise-related items, which are coded 1 = not at all/a little true, 2 = very true. This is because the child question on fruit and vegetable consumption has a much lower standard (i.e. simply eating fruits and vegetables daily), so a more lax approach to eating fruits and vegetables is a better option here so that the parent and child fruit and vegetables questions are similar.

[10] High-risk birth control use refers to individuals who are not using birth control (women aged 50 or older are coded as low-risk, due to menopause). There is information about whether respondents are trying to get pregnant in subsequent time points, but that information was not available at Time 1.

[11] High-risk condom use includes those respondents who are not in any form of a steady relationship and report not using a condom at last sex.

Slightly more female children than male children were included in the study, and the mean age of children at baseline was 10. Children were roughly equally split between 4th and 5th grade at baseline, and about 95% of children identified primarily as African American or black.[12] 90% of the "parents" were biological, step, or adoptive parents, but the others were adult guardians like grandmothers. The mean age of parents (top-coded at 60) was 36 at baseline and less than 5% of parent participants were male. Approximately 75% of parents had at least a high school diploma or GED, and about a quarter of the sample received either an AA/technical or 4-year college degree or more, split equally between the two. Half of the parents worked full-time, roughly 20% of families had an income of less than $500 per month, and only 30% of the sample made $2,000 per month or more. 45% of the parents were married at baseline, about 12% were cohabiting, and approximately 16% reported no steady partner. The families were predominantly religious, with over 70% of the sample reporting attending a religious service once a month or more.

Parents and children both reported relatively high levels of parental monitoring, relationship quality, parent-child communication, and parental responsiveness. Interestingly, parents reported higher levels of parental monitoring and parent-child communication, while children viewed the quality of the relationship more favorably than their parents did. Although child and parental perceptions of parental responsiveness were on different scales (1-2 and 1-3, respectively) the average value for parental responsiveness for both children and parents was in the upper quartile of possible values.

[12] 5% of the children did not identify as black, but given the race inclusion criterion for parents (i.e. that they identify as African American), children's responses may speak more about which racial/ethnic identity is most salient. In the original eight-category variable only 13 of the children identified as American Indian or Alaskan, Asian, Hispanic or Latino (which is usually not mutually exclusive from African American but is a distinct category in this survey), Native Hawaiian or other Pacific Islander, or white. The remaining 35 children selected biracial or "other", a category which may include multiracial identities.

For child-specific variables, the majority of children felt they did well on schoolwork and were happy in the past month. Roughly 65% of children thought that none of their peers had initiated sex, but over 10% believed about half or more had done so. Only half of parents held that it was "very true" that people should wait to have sex until marriage, but nearly all (85%) of the children believed that their parents wanted them to wait until they were older to have sex.

For parent-specific variables, only about 20% of parents had sex for the first time when they were 18 or older. Roughly 35% had their sexual debut when they were 13-15 years old, and 5% of parents experienced their sexual debut when they were 12 years old or younger. More than half of parents used condoms the first time they had sex, approximately 65% used birth control the first time they had sex, and about 28% of parents were or had been teen parents. The vast majority of parents believed it was their job to teach their child about sex, and over 80% said religion was "very important" in their lives.

Regarding health behaviors, a third of children reported eating fruits and vegetables or consuming dairy products daily. Over half of children ate breakfast daily, and more than 60% were physically active daily. Relatively few children said they had tried alcohol, tobacco products, drugs, been in trouble with the police, or touched or been touched under clothing, although about 35% of children reported getting into fights. 80% believed they should wait until they were older to have sex, but about 7% foresaw an even chance or greater that they would have sex in the next year, and roughly 3% said they had willingly touched a boyfriend or girlfriend's "private parts" or willingly been touched there at baseline.

For parents, about 50% agreed it was "a little true" or "very true" that they ate at least five fruits and vegetables a day[13], roughly 20% read nutrition labels daily, and 25% of parents baked, broiled, or grilled instead of frying. Less than 20% exercised for at least 20 minutes a day three days a week. About 6% of parents had multiple sexual partners in the last six months, 50% engaged in "high-risk" birth control use, and about 7% reported high-risk condom use. Approximately 26% of the sample felt nervous or stressed, and about 60% believed they were able to handle life events. Roughly 96% of parents believed teens should know how to use birth control before having sex, and about 97% believed teens should know how to use condoms before having sex.

Three variables showed significant differences between the intervention groups: child perception of how many peers have had sex, whether parents used a condom the first time they had sex, and whether parents read nutrition labels. The Brief Intervention group differed from the Enhanced Intervention and General Intervention groups, with more children in the Brief Intervention believing half or more of their peers had initiated sex, fewer Brief Intervention parents reporting using a condom the first time they had sex, and more Brief Intervention parents saying they read nutrition labels daily. Given the fact that parents were randomized into intervention arms, these differences are likely simply due to chance.

[13] This percentage is higher than what the children reported. However, recoding the fruit and vegetable variable to match the other health variables (e.g. with "very true" coded as the indicator value) would leave only 11% of parents reporting that they ate at least five fruits and vegetables a day and seemed like a much stricter requirement for being classified as healthy than in the fruit and vegetable consumption variable for children.

**Retention Analysis**

A retention analysis (Table 6.2) showed that 651 dyads were retained at the three-year follow-up and 464 dyads left the study.

**Table 6.2: Retention Analysis of Parents Matter! Participants at the 3-Year Follow-Up**

| | Retained (*N* = 651 Dyads) | Not Retained (*N* = 464 Dyads) | |
|---|---|---|---|
| **Variable** | **%** | **%** | **p-value[1]** |
| Child sex | | | |
| Male | 44.36 | 45.24 | .772 |
| Female | 55.64 | 54.76 | |
| Child grade | | | |
| 4th grade | 45.75 | 46.10 | .907 |
| 5th grade | 54.25 | 53.90 | |
| Relationship of caregiver to child | | | |
| Other | 9.32 | 10.92 | .379 |
| Parent[2] | 90.68 | 89.08 | |
| Parent education | | | |
| < High school diploma | 21.43 | 28.17 | .116 |
| High school diploma/GED | 30.28 | 28.17 | |
| Some college | 22.52 | 19.35 | |
| AA/technical degree | 12.89 | 13.12 | |
| College degree or higher | 12.89 | 11.18 | |
| Family income per month | | | |
| $0-499 | 16.61 | 22.08 | .162 |
| $500-999 | 22.04 | 20.75 | |
| $1000-1999 | 30.67 | 28.26 | |
| $2000+ | 30.67 | 28.92 | |
| Parent employment | | | |
| Other | 35.05 | 46.14 | .001 |
| Part-time | 11.21 | 9.66 | |
| Full-time | 53.74 | 44.21 | |
| Site | | | |
| Athens | 30.60 | 26.07 | .000 |

| | | | |
|---|---|---|---|
| Atlanta | 23.49 | 37.61 | |
| Little Rock | 45.90 | 36.32 | |
| Parent number of sexual partners in the past six months | | | |
| 0-1 | 93.05 | 95.62 | .081 |
| 2 or more | 6.95 | 4.38 | |
| Parent high-risk birth control use[3] | | | |
| No | 50.08 | 50.11 | .992 |
| Yes | 49.92 | 49.89 | |
| Parent high-risk condom use[4] | | | |
| No | 91.60 | 93.61 | .255 |
| Yes | 8.40 | 6.39 | |
| Child's perceived likelihood of having sex in the next year | | | |
| Less than an even chance | 92.68 | 93.72 | .499 |
| Even chance or greater | 7.32 | 6.28 | |
| Child has willingly touched boyfriend or girlfriend's "private parts" or willingly been touched there | | | |
| No | 96.90 | 97.40 | .625 |
| Yes | 3.10 | 2.60 | |

[1] Differences between intervention groups were tested for significance using contingency tables/chi-square statistic for categorical variables.
[2] "Parent" includes biological, adoptive, and step-parents.
[3] High-risk birth control use refers to individuals who are not using birth control (women aged 50 or older are coded as low-risk, due to menopause).
[4] High-risk condom use includes those respondents who are not in any form of a steady relationship and report not using a condom at last sex.

The dyads lost to follow-up were similar to the ones that remained on a host of demographic and sexual behavior variables, with the exception of parent employment and the intervention site. Parents who remained in the study were more likely to work full-time (54% of those retained versus 44% of those not retained), while those who left the study were more likely to belong to the "other" category of employment. This difference is counterintuitive, since one might expect that parents who worked full-time would be too busy to remain in the study. However, parents in the "other" category may have faced more unstable job prospects with less leeway over their schedules, which would limit their ability to commit to the intervention sessions and surveys. A significant difference also existed by intervention site. More dyads from Little Rock remained in the study, while more dyads from Atlanta were lost to follow-up. This difference may have resulted from varying retention efforts between the two cities, but given the rigor of the retention design and the effort by the interventionists to keep operations as similar as possible across sites, this explanation is unlikely. Atlanta is known as being a city of transplants, so parents there may have been more likely to return to their hometowns or move somewhere else.

**Question 1: Do sexual risk behaviors, intentions, and attitudes share a health lifestyle in common with generally studied health behaviors like exercise, nutrition, smoking, and alcohol habits in preadolescents and adults?**

The correlations between children's health behaviors (Table 6.3) and parents' health behaviors (Table 6.4) demonstrate that each health variable is significantly correlated with at least one other health variable for both children and parents.

**Table 6.3: Correlation Matrix for Child Health Behaviors (Parents Matter! Data, 2001-2006)**

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Eats fruits and vegetables daily | 1.00 | .41* | .17* | .29* | -.08* | -.07* | -.02 | .00 | .05 | -.02 | -.03 |
| 2. Consumes dairy products daily | .41* | 1.00 | .21* | .34* | -.08* | -.06 | -.04 | .03 | .04 | .00 | .05 |
| 3. Eats breakfast daily | .17* | .21* | 1.00 | .20* | -.05 | -.02 | -.04 | .00 | .01 | -.11* | .04 |
| 4. Gets physical activity daily | .29* | .34* | .20* | 1.00 | -.03 | -.05 | -.05 | .01 | .06* | -.01 | .04 |
| 5. Ever drank alcohol | -.08* | -.08* | -.05 | -.03 | 1.00 | .31* | .16* | .12* | .14* | .17* | -.07* |
| 6. Ever used tobacco | -.07* | -.06 | -.02 | -.05 | .31* | 1.00 | .16* | .07* | .11* | .13* | -.07* |
| 7. Ever used drugs | -.02 | -.04 | -.04 | -.05 | .16* | .16* | 1.00 | .03 | .16* | .16* | -.06* |
| 8. Gets into fights | .00 | .03 | .00 | .01 | .12* | .07* | .03 | 1.00 | .10* | .10* | -.11* |
| 9. Gets into trouble with the police | .05 | .04 | .01 | .06* | .14* | .11* | .16* | .10* | 1.00 | .15* | -.09* |
| 10. Has touched or being touched under the clothes by a boyfriend or girlfriend | -.02 | .00 | -.11* | -.01 | .17* | .13* | .16* | .10* | .15* | 1.00 | -.20* |
| 11. Believes s/he should wait until s/he is older to have sex | -.03 | .05 | .04 | .04 | -.07* | -.07* | -.06* | -.11* | -.09* | -.20* | 1.00 |

** = $p \leq .05$*

**Table 6.4: Correlation Matrix for Parent Health Behaviors (Parents Matter! Data, 2001-2006)**

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Eats at least five fruits and vegetables a day | 1.00 | .18* | .11* | .08* | -.08* | .05 | -.07* | -.07* | -.03 | -.05 | .05 |
| 2. Reads nutrition labels | .18* | 1.00 | .38* | .32* | -.07* | -.05 | -.09* | -.04 | -.03 | -.03 | .10* |
| 3. Bakes, broils, or grills instead of frying | .11* | .38* | 1.00 | .21* | -.03 | -.05 | -.09* | -.04 | .01 | -.03 | .08* |
| 4. Exercises for at least 20 minutes a day three days a week | .08* | .32* | .21* | 1.00 | -.03 | -.01 | -.08* | -.04 | .00 | -.07* | .10* |
| 5. More than two sexual partners in the past six months | -.08* | -.07* | -.03 | -.03 | 1.00 | .09* | .04 | .01 | .02 | .10* | -.14* |
| 6. High-risk condom use | .05 | -.05 | -.05 | -.01 | .09* | 1.00 | .03 | -.03 | -.03 | .04 | -.04 |
| 7. High-risk birth control use | -.07* | -.09* | -.09* | -.08* | .04 | .03 | 1.00 | -.03 | -.05 | .06* | -.02 |
| 8. Believes teens should know how to use birth control before having sex | -.07* | -.04 | -.04 | -.04 | .01 | -.03 | -.03 | 1.00 | .75* | .02 | .02 |
| 9. Believes teens should know how to use condoms before having sex | -.03 | -.03 | .01 | .00 | .02 | -.03 | -.05 | .75* | 1.00 | -.01 | .02 |
| 10. Feels nervous/stressed | -.05 | -.03 | -.03 | -.07* | .10* | .04 | .06* | .02 | -.01 | 1.00 | -.28 |
| 11. Feels able to handle life events | .05 | .10* | .08* | .10* | -.14* | -.04 | -.02 | .02 | .02 | -.28* | 1.00 |

** = $p \leq .05$*

[1] High-risk birth control use refers to individuals who are not using birth control (women aged 50 or older are coded as low-risk, due to menopause).

[2] High-risk condom use includes those respondents who are not in any form of a steady relationship and report not using a condom at last sex.

Nutrition and exercise behaviors were associated with one another, but these behaviors were also significantly (negatively) correlated with various delinquency and sexual behaviors for children and sexual behaviors, sexual attitudes, and stress for parents, providing some evidence for an underlying lifestyle uniting the behaviors. For example, among children, drinking alcohol was positively associated with using tobacco (.31) or drugs (.16), getting into fights (.12) or trouble with the police (.14), and touching or being touched under clothing (.17). It was negatively associated with eating fruits and vegetables (-.08) or consuming dairy (-.08) daily and believing that he/she should wait until he/she is older to have sex (-.07).

Tables 6.5 and 6.6 present the latent class analysis model fit statistics for children and parents. The best-fitting class solution for each criterion is highlighted in the table.

**Table 6.5: Latent Class Analysis Model Fit Statistics for Children (Parents Matter! Data, 2001-2006)**

| Fit Statistics | 2 Classes | 3 Classes | 4 Classes | 5 Classes | 6 Classes |
|---|---|---|---|---|---|
| AIC[1] | 957.80 | 780.17 | 745.33 | 740.91 | 747.18 |
| BIC[2] | 1073.05 | 955.56 | 980.85 | 1036.57 | 1102.98 |
| BIC*[3] | 1000.00 | 844.39 | 831.57 | 849.17 | 877.46 |
| CAIC[4] | 1096.05 | 990.56 | 1027.85 | 1095.57 | 1173.98 |
| LL[5] | -5453.72 | -5352.91 | -5323.49 | -5309.28 | -5300.42 |
| $G^2$ | 911.80 | 710.17 | 651.33 | 622.91 | 605.18 |
| DF | 2024 | 2012 | 2000 | 1988 | 1976 |

[1] Akaike Information Criterion
[2] Bayesian Information Criterion
[3] Bayesian Information Criterion adjusted for sample size
[4] Consistent AIC
[5] Log-likelihood

**Table 6.6: Latent Class Analysis Model Fit Statistics for Parents (Parents Matter! Data, 2001-2006)**

| Fit Statistics | 2 Classes | 3 Classes | 4 Classes | 5 Classes | 6 Classes |
|---|---|---|---|---|---|
| AIC[1] | 798.28 | 666.76 | 583.83 | 581.75 | 564.56 |
| BIC[2] | 913.58 | 842.21 | 819.44 | 877.52 | 920.48 |
| BIC*[3] | 840.53 | 731.04 | 670.16 | 690.12 | 694.97 |
| CAIC[4] | 936.58 | 877.21 | 866.44 | 936.52 | 991.48 |
| LL[5] | -5259.77 | -5182.00 | -5128.54 | -5115.50 | -5094.90 |
| $G^2$ | 752.28 | 596.76 | 489.83 | 463.75 | 422.50 |
| DF | 2024 | 2012 | 2000 | 1988 | 1976 |

[1] Akaike Information Criterion
[2] Bayesian Information Criterion
[3] Bayesian Information Criterion adjusted for sample size
[4] Consistent AIC
[5] Log-likelihood

For children, the Akaike Information Criterion (AIC) pointed to a five-class solution, but the Bayesian Information Criterion (BIC) and Consistent AIC (CAIC) preferred the three-class solution. The BIC adjusted for sample size (BIC*), on the other hand, indicated a four-class solution, and in fact the four-class solution seemed to best balance the AIC, BIC, and CAIC statistics. A four-class solution was also the best solution for parents, according to the BIC, BIC*, and CAIC, although the AIC suggested a six-class solution was a better fit, which is to be expected given that AIC statistics often overestimate the number of classes (Lanza and Rhoades 2013).

The item-response probabilities in Table 6.7, which can be interpreted as each class's mean level of each behavior or the probability of members of that class participating in a behavior, provide qualitative support for four distinct child health lifestyles.

**Table 6.7: Item-Response Probabilities for Child Health Lifestyle Indicators Used in Latent Class Analysis (Parents Matter! Data, 2001-2006)**

| Variable | **Child Class 1** *Healthy and low-risk* (28%, N ≈ 311) | **Child Class 2** *Unhealthy and high-risk* (11%, N ≈ 122) | **Child Class 3** *Unhealthy and low-risk* (56%, N ≈ 621) | **Child Class 4** *Healthy and high-risk* (4%, N ≈ 44) |
|---|---|---|---|---|
| Eats fruits and vegetables daily | .69[1] (.04) | .04 (.02) | .12 (.02) | .59 (.10) |
| Consumes dairy daily | .80 (.04) | .07 (.04) | .12 (.02) | .62 (.11) |
| Eats breakfast daily | .80 (.03) | .44 (.06) | .44 (.02) | .39 (.11) |
| Engages in physical activity daily | .97 (.02) | .35 (.06) | .48 (.03) | 1.00 (.01) |
| Has ever consumed alcohol | .07 (.02) | .64 (.08) | .11 (.02) | .64 (.11) |
| Has ever used tobacco | .04 (.01) | .45 (.10) | .00 (.00) | .12 (.07) |
| Has ever used drugs | .00 (.00) | .11 (.03) | .00 (.00) | .07 (.05) |
| Gets into fights | .30 (.03) | .48 (.06) | .28 (.05) | .88 (.13) |
| Gets into trouble with the police | .11 (.02) | .25 (.05) | .05 (.01) | .45 (.11) |
| Has willingly touched or been touched under the clothes | .02 (.01) | .24 (.05) | .03 (.01) | .45 (.12) |
| Believes s/he should have sex until s/he is older | .84 (.03) | .66 (.06) | .83 (.02) | .52 (.10) |

Note: All variables are coded 1 = yes, 0 = no.

[1] Rho estimates (standard errors)

Class 1, a healthy and low-risk lifestyle, made up 28% of the sample, and the majority of children in this class practiced healthy eating and exercise behaviors. For example, 80% of children in Class 1 ate breakfast daily. They were also more likely to believe they should wait until they were older to have sex. Very few of the children in Class 1 consumed alcohol (.07), used tobacco (.04) or drugs (.00), or had touched or been touched under the clothing (.02). Although nearly a third of them got into fights, this number was much lower than in the high-risk lifestyles of Class 2 (.48) and Class 4 (.88).

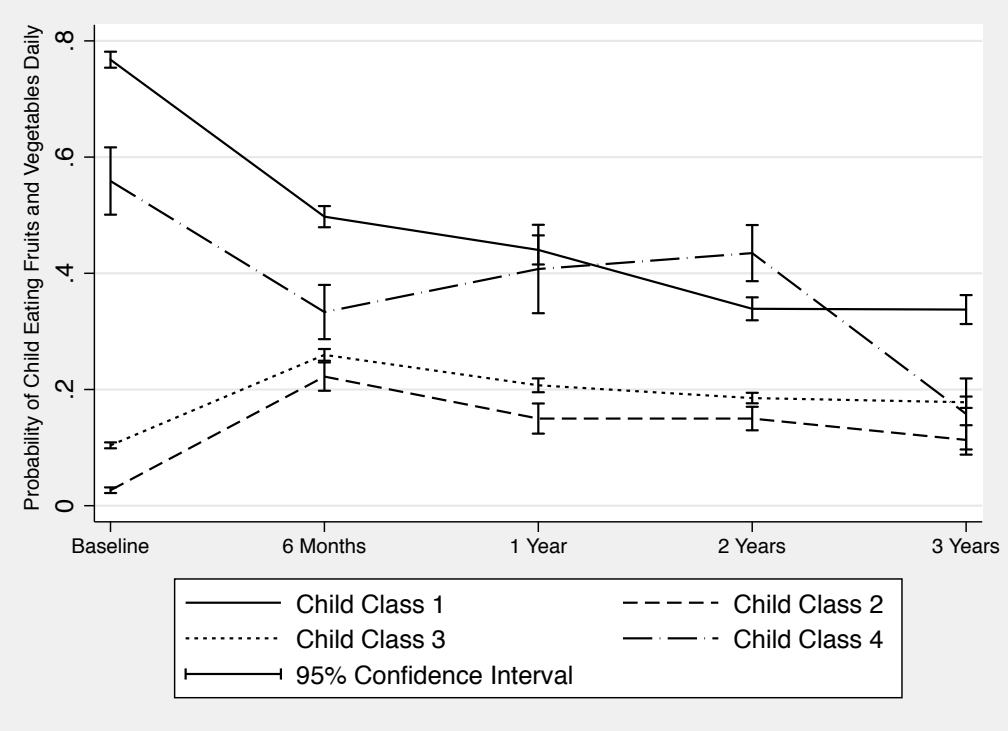
Class 2 was an unhealthy and high-risk lifestyle. Children in this class, 11% of the total sample, had a low probability of eating fruits and vegetables (.04) or consuming dairy (.07) daily. Their probability of eating breakfast daily (.44) was similar to that of children in Class 3 (.44) and Class 4 (.39), but their odds of getting physical activity (.35) were the lowest of all four classes. The children in Class 2 were more likely than children in Class 1 to engage in delinquent behaviors like using tobacco (.45) or drugs (.11), getting into fights (.48), getting into trouble with the police (.25), or having touched or been touched under clothing (.24). In fact, two thirds of these children had consumed alcohol. Class 2 children also had a lower probability of believing they should wait until they are older to have sex (.66) compared to the children in Class 1 (.84) or Class 3 (.83).

While Class 1 and Class 2 represented binary health lifestyles (all healthy versus all unhealthy), Class 3 and Class 4 were a mixture of healthy and unhealthy lifestyles. Children in Class 3 (56% of the sample) had an unhealthy but low-risk lifestyle. Fewer than half of these children engaged in healthy eating or exercise behaviors, but their probability of engaging in delinquent and sexual risk behaviors was similar to or lower than that of children in Class 1, the healthiest lifestyle overall. For example, only 2% of children in Class

1 had touched or been touched under clothing, and only 3% of children in Class 3 had done so. A mere 4% of children fell into Class 4, making it the smallest class, and this class was a mixture of healthy and high-risk behaviors. These children were less likely to consume fruits and vegetables (.59) and dairy (.62) daily as compared to children in Class 1, but they engaged in these behaviors much more often than children in Class 2 or Class 3 did. They were even more likely than the children in Class 1 to engage in physical activity daily (1.00). The children in Class 4, however, had a probability of consuming alcohol (.64), fighting (.88), getting into trouble with the police (.45), and touching or being touched under clothing (.45) that was equal to or greater than the probability for children in the other class with high-risk characteristics, Class 2. The children in Class 4 were less likely to use tobacco (.12) or drugs (.07) than the children in Class 2, but only half believed they should wait to have sex until they are older.

Figure 6.1 depicts the distinctions between the four classes at baseline, as well as how baseline latent class was associated with engaging in health behaviors over time (using estimates adjusted for all child covariates). The graph shows the probability of a child eating fruits and vegetables daily in order to demonstrate the lasting effect of baseline latent class over time (see Figures A.7-10 for examples of similar trends for physical activity, drinking alcohol, using drugs, and touching or being touched under clothing).

**Figure 6.1: Probability of Child Eating Fruits and Vegetables Daily Over Time by Child Latent Class at Baseline, Adjusted for All Child Covariates (Parents Matter! Data, 2001-2006)**




Baseline latent class significantly predicted different probabilities of fruit and vegetable consumption, and these significant differences between the classes with the healthiest general health lifestyles (i.e. Classes 1 and 4) and those with the unhealthiest general health lifestyles (i.e. Classes 2 and 3) persisted for two years, with children in Class 1 continuing to have a higher probability of consumption than the children in the other classes at the three-year follow-up. For most behaviors children became progressively less healthy as they aged, engaging in fewer health-promoting behaviors and more health risk behaviors, but baseline latent class protected children since they either started with higher or lower levels of a given behavior, and often their trajectory into or out of a behavior was less steep than the trajectory of children in Class 2 or Class 3.

For parents (Table 6.8), the division between classes did not map as easily onto a binary versus bidimensional approach to health lifestyles as it did for children.

**Table 6.8: Item-Response Probabilities for Parent Health Lifestyle Indicators Used in Latent Class Analysis (Parents Matter! Data, 2001-2006)**

| Variable | **Parent Class 1** *Healthy, lower sexual risk, moderate stress* (20%, N ≈ 222) | **Parent Class 2** *Somewhat healthy, high sexual risk, some stress* (3%, N ≈ 33) | **Parent Class 3** *Unhealthy, some sexual risk, high stress* (26%, N ≈ 289) | **Parent Class 4** *Unhealthy, lower sexual risk, low stress* (51%, N ≈ 567) |
|---|---|---|---|---|
| Eats fruits and vegetables daily | .72[1] | .67 | .43 | .50 |
| | (.04) | (.08) | (.04) | (.03) |
| Reads nutrition labels | .87 | .31 | .10 | .05 |
| | (.07) | (.08) | (.03) | (.03) |
| Bakes, broils, or grills instead of frying | .68 | .30 | .17 | .15 |
| | (.06) | (.08) | (.03) | (.02) |
| Engages in 20 minutes of exercise three times a week | .48 | .22 | .07 | .11 |
| | (.05) | (.07) | (.02) | (.02) |
| Has had two or more sex partners in the past six months | .01 | .06 | .15 | .03 |
| | (.01) | (.04) | (.03) | (.01) |
| High-risk condom use[2] | .04 | .13 | .12 | .06 |
| | (.02) | (.06) | (.03) | (.02) |
| High-risk birth control use[3] | .39 | .61 | .58 | .49 |
| | (.04) | (.09) | (.04) | (.03) |
| Believes teens should know about birth control before sex | .98 | .06 | 1.00 | 1.00 |
| | (.01) | (.07) | (.00) | (.01) |
| Believes teens should know about condoms before sex | 1.00 | .22 | 1.00 | 1.00 |
| | (.00) | (.11) | (.00) | (.00) |
| Feels nervous or stressed | .19 | .24 | .65 | .09 |
| | (.03) | (.08) | (.11) | (.05) |
| Feels able to handle life | .78 | .53 | .22 | .77 |

| | | | | |
|---|---|---|---|---|
| events | (.04) | (.09) | (.10) | (.06) |

Note: All variables are coded 1 = yes, 0 = no.

[1] Rho estimates (standard errors)

[2] High-risk birth control use refers to individuals who are not using birth control (women aged 50 or older are coded as low-risk, due to menopause).

[3] High-risk condom use includes those respondents who are not in any form of a steady relationship and report not using a condom at last sex.

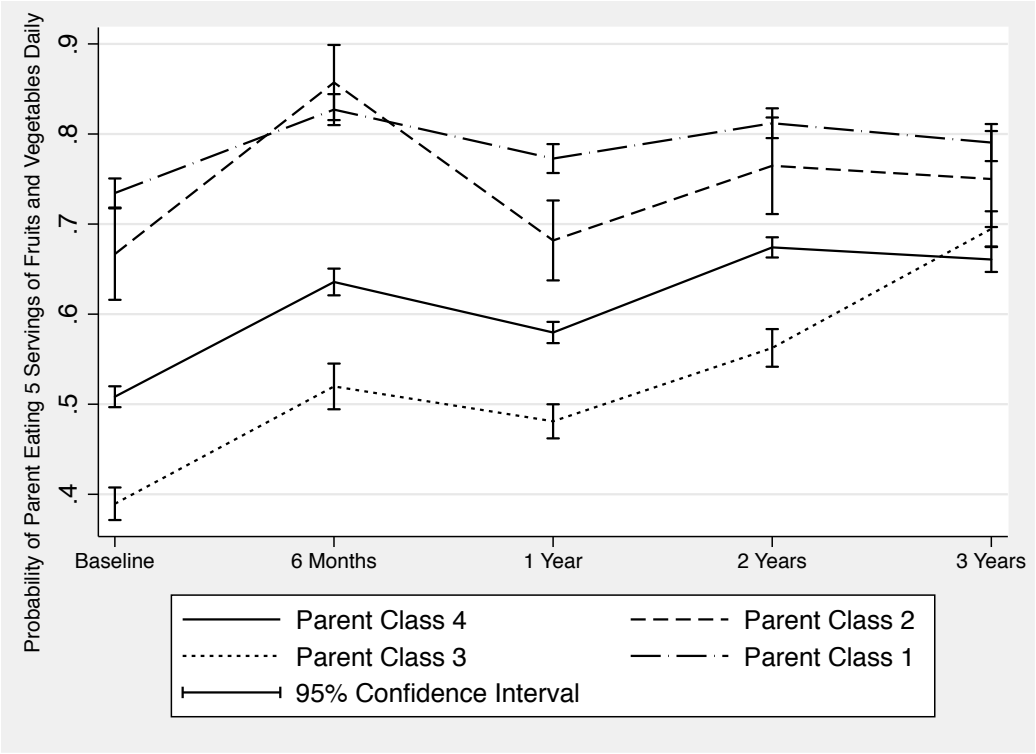
20% of the sample belonged to Class 1, and this class was marked by the highest probability of healthy eating and exercise behaviors (e.g. 87% read nutrition labels), the lowest probability of sexual risk (e.g. 4% had high-risk condom use), and some probability of feeling stressed (.19). Only 3% of the sample belonged to Class 2. Parents in this class were moderately healthy (perhaps not objectively, but when compared to other parents [e.g. 22% exercised]), regarding nutrition and exercise behaviors. Only a handful had multiple sexual partners (.06), but they reported high-risk condom use (.13) and "high-risk" birth control use more often than did parents in any of the other classes (.61). A quarter of these parents felt nervous or stressed and only half felt able to handle life events. What truly set these parents apart, however, was their attitude toward sex. While almost all parents in the other classes believed teens should know how to use birth control and condoms before having sex, only 6% and 22% (respectively) of parents in Class 2 agreed. Thus, even if these parents were in a committed relationship and not eligible for high-risk condom use (given the operationalization of the variable), these attitude variables may operate as a proxy for how parents might have acted in the absence of a committed relationship. Minimally, the set of probabilities in Class 2 suggest a very different disposition toward sex and risk behaviors in general, thereby providing additional evidence for a multi-class solution.

The parents in Class 3, 26% of the sample, ate fruits and vegetables daily (.43), read nutrition labels (.10), baked, broiled, or grilled instead of frying (.17), and exercised (.07) at levels similar to the members of Class 4. Unlike the parents in Class 4, however, Class 3 parents had higher probabilities of sexual risk (e.g. 15% had multiple sexual partners). Class 3 parents were also the most stressed parents in the sample, with two thirds feeling nervous or stressed and less than a quarter believing they were able to handle life events.

Class 4 made up over half of the sample for parents (51%), and members of this class had a low probability of healthy nutrition and exercise behaviors (e.g. 5% read nutrition labels). Very few of these parents had multiple sexual partners (.03) or engaged in high-risk condom use (.04). Although 49% reported "high-risk" birth control use, this number was the lowest for all four classes, with the exception of Class 1, the healthiest class overall. Parents in this class believed it was important than teens know about birth control (.98) and condoms (1.00) before having sex. Class 4 parents had the lowest probability of feeling nervous or stressed (.19), and over 75% of them felt able to handle life events. In general, the constellation of behavior patterns was much more complicated for parents than it was for children. Although there was evidence of an overall healthy lifestyle (i.e. Class 1), the remaining classes were a mixture of health-promoting and health-compromising behaviors and attitudes that resist a binary categorization of purely—or even mostly—good or bad.

Figure 6.2 illustrates graphically the complexity of the parent baseline latent classes. As with the graphs for children, the probability estimates in these graphs have also been adjusted, in this case for all parent covariates.

**Figure 6.2: Probability of Parent Eating Five Servings of Fruits and Vegetables Daily Over Time by Parent Latent Class at Baseline, Adjusted for All Parent Covariates (Parents Matter! Data, 2001-2006)**




Unlike children, who slowly adopted more unhealthy behaviors over time, parents' behaviors either grew healthier or remained relatively stable. In the graph, parents in Class 1 or Class 2 at baseline had a probability of eating five servings of fruits and vegetables daily that was significantly higher than that of parents in Class 3 or Class 4 for two years, although there was no lasting difference between Class 1 and Class 2. Parents in Class 3 increased their intake of fruits and vegetables, but significantly lagged behind Class 4 until the three-year follow-up. The lasting benefit of belonging to Class 1 was also evident for reading nutrition labels, exercising, having multiple sexual partners, high-risk birth control use, and feeling able to handle life events (see Figures A.11-15 in the Appendix).

**Question 2: What social factors are associated with preadolescents' and adults' health lifestyles?**

The tables in this section present the adjusted relative risk ratios (RRR) for whether social factors were associated with children (Table 6.9) and parents (Table 6.10) belonging to a baseline latent class other than the healthiest and lowest-risk lifestyle, (Class 1 for both children and parents). See Tables A.2-3 in the Appendix for the unadjusted RRR.

**Table 6.9: Adjusted Relative Risk Ratios (RRR) for Child Latent Class Membership at Baseline Using Multinomial Logistic Regression (Parents Matter! Data, 2001-2006, *N* = 890)**

| | Child Class 2[1] *Unhealthy and high-risk* | | Child Class 3[1] *Unhealthy and low-risk* | | Child Class 4[1] *Healthy and high-risk* | |
|---|---|---|---|---|---|---|
| **Variable** | **Adjusted RRR** | **(95% CI)** | **Adjusted RRR** | **(95% CI)** | **Adjusted RRR** | **(95% CI)** |
| Female[2] | .59 | (.33, 1.04) | 1.07 | (.77, 1.49) | .20** | (.08, .51) |
| Child age | 1.22 | (.79, 1.87) | 1.11 | (.86, 1.43) | 1.60 | (.86, 2.98) |
| Grade[3] | .81 | (.41, 1.63) | 1.35 | (.90, 2.02) | 1.04 | (.36, 3.01) |
| Parent education[4] | | | | | | |
| High school diploma/GED | 1.85 | (.88, 3.89) | 1.26 | (.82, 1.95) | .92 | (.28, 2.99) |
| Some college | .87 | (.33, 2.26) | 1.81* | (1.08, 3.03) | 1.64 | (.42, 6.34) |
| AA/technical degree | .93 | (.30, 2.94) | 1.93* | (1.05, 3.53) | .39 | (.06, 2.46) |
| College degree or higher | 1.68 | (.55, 5.10) | 1.81 | (.94, 3.48) | 1.96 | (.39, 9.94) |
| Monthly family income[5] | | | | | | |
| $500-999 | 3.03* | (1.12, 8.18) | 1.02 | (.62, 1.68) | 1.26 | (.32, 4.89) |
| $1000-1999 | 2.86* | (1.01, 8.07) | .92 | (.55, 1.54) | .49 | (.10, 2.41) |
| $2000+ | 4.04* | (1.34, 12.13) | .92 | (.52, 1.62) | 1.88 | (.39, 9.00) |
| Parent employment[6] | | | | | | |
| Part-time | 2.16 | (.91, 5.16) | 1.57 | (.88, 2.80) | 6.81** | (1.63, 28.45) |
| Full-time | .60 | (.30, 1.18) | 1.24 | (.84, 1.84) | 3.28* | (1.14, 9.39) |
| Family structure[7] | | | | | | |
| Steady partner | 1.49 | (.62, 3.59) | .94 | (.58, 1.52) | 1.87 | (.44, 8.02) |
| Cohabiting | 1.28 | (.44, 3.74) | 1.29 | (.72, 2.31) | 1.12 | (.23, 5.44) |
| Married | 1.26 | (.53, 3.02) | 1.33 | (.83, 2.15) | 2.67 | (.62, 11.52) |
| Religious attendance[8] | | | | | | |
| Once or twice a month | 1.06 | (.47, 2.40) | .75 | (.46, 1.21) | .92 | (.29, 2.89) |
| Once a week or more | .65 | (.31, 1.35) | .82 | (.54, 1.23) | .31* | (.10, .93) |
| Does well on schoolwork | .64 | (.36, 1.13) | .52*** | (.37, .72) | .36* | (.15, .86) |
| Happy in the past month | .24*** | (.12, .48) | .73 | (.43, 1.24) | .44 | (.15, 1.27) |
| Peers who have had sex[9] | | | | | | |
| Only a few | 2.37* | (1.20, 4.68) | 1.11 | (.73, 1.67) | 16.94*** | (4.76, 60.27) |

| | | | | | | |
|---|---|---|---|---|---|---|
| About half or more | 4.13*** | (1.91, 8.94) | 1.08 | (.63, 1.88) | 45.95*** | (12.39, 170.46) |
| Believes parent think s/he should wait to have sex | .73 | (.36, 1.49) | 1.15 | (.73, 1.80) | .62 | (.21, 1.77) |
| Parent believes no sex before marriage[10] | | | | | | |
| A little true | 1.19 | (.52, 2.74) | 1.30 | (.83, 2.06) | .82 | (.27, 2.48) |
| Very true | 1.46 | (.67, 3.18) | .96 | (.62, 1.48) | .45 | (.15, 1.38) |
| Site[11] | | | | | | |
| Atlanta | .59 | (.27, 1.27) | .63* | (.41, .95) | 1.20 | (.36, 4.05) |
| Little Rock | 1.17 | (.59, 2.32) | 1.15 | (.77, 1.73) | 1.49 | (.47, 4.71) |
| Log-likelihood | -764.90 | | | | | |
| AIC[12] | 2.03 | | | | | |
| BIC[13] | -3563.62 | | | | | |
| Maximum likelihood $R^2$ | .23 | | | | | |
| McFadden's $R^2$ | .13 | | | | | |
| Cragg & Uhler's $R^2$ | .27 | | | | | |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Class 1 (a healthy and low-risk lifestyle) is the reference category.

[2] Male is the reference category.

[3] 4th grade is the reference category, and 5th grade is the indicator value.

[4] Less than a high school diploma or GED is the reference category.

[5] $0-499 is the reference category.

[6] Other employment status (e.g. student, unemployed) is the reference category.

[7] No steady partner is the reference category.

[8] Never or a few times a year is the reference category.

[9] None is the reference category.

[10] Not at all true is the reference category.

[11] Athens is the reference category.

[12] Akaike Information Criterion

[13] Bayesian Information Criterion

Children were three to four times more likely to belong to Class 2, the unhealthy and high-risk class, if their families had a monthly income greater than $500, and those who believed at least some of their peers had already had sex were two to four times more likely to belong to that class. However, being happy in the past month reduced the likelihood that children would be members of Class 2 by 76%. Children whose parents had some college or an AA/technical degree (as compared to less than a high school diploma) were twice as likely to belong to Class 3, the unhealthy and low-risk class, although a significant association did not extend to children whose parents had a college degree or higher. Those who did well on schoolwork halved their likelihood of belonging to Class 3, and those who lived in Atlanta (versus Athens) were 37% less likely to belong to Class 3.

For Class 4, the healthy and high-risk class, children were 80% less likely to belong if they were female, 69% less likely to belong if they attended religious services once a week or more (as compared to never attending), and 64% less likely to belong if they did well on schoolwork. Children whose parents were employed part-time or full-time were three to seven times more likely to belong to Class 4, however, and those who believed their peers had had sex were 17 to 46 times more likely to belong to that class. While the peer estimates are likely too unstable to be taken at face value, they nonetheless indicate a strong association between peer norms and membership in Class 4.

The results for parents can be seen in the following table:

**Table 6.10: Adjusted Relative Risk Ratios (RRR) for Parent Latent Class Membership at Baseline Using Multinomial Logistic Regression (Parents Matter! Data, 2001-2006, *N* = 876)**

| | **Parent Class 2[1]** *Somewhat healthy, high sexual risk, some stress* | | **Parent Class 3[1]** *Unhealthy, some sexual risk, high stress* | | **Parent Class 4[1]** *Unhealthy, lower sexual risk, low stress* | |
|---|---|---|---|---|---|---|
| **Variable** | **Adjusted RRR** | **(95% CI)** | **Adjusted RRR** | **(95% CI)** | **Adjusted RRR** | **(95% CI)** |
| Female[2] | 4.86 | (.45, 52.47) | 2.49 | (.60, 10.26) | 1.74 | (.72, 4.21) |
| Parent age | 1.01 | (.95, 1.07) | .94** | (.91, .98) | .98 | (.95, 1.00) |
| Education[3] | | | | | | |
| High school diploma/GED | .45 | (.11, 1.88) | .75 | (.40, 1.40) | 1.00 | (.58, 1.73) |
| Some college | 1.12 | (.30, 4.19) | .44* | (.22, .91) | .68 | (.38, 1.25) |
| AA/technical degree | .77 | (.16, 3.61) | .34* | (.15, .78) | .54 | (.28, 1.06) |
| College degree or higher | .70 | (.12, 4.08) | .38* | (.15, .95) | .59 | (.29, 1.21) |
| Monthly family income[4] | | | | | | |
| $500-999 | .08* | (.01, .81) | 1.06 | (.52, 2.15) | .86 | (.46, 1.61) |
| $1000-1999 | .89 | (.22, 3.54) | .84 | (.40, 1.80) | 1.08 | (.57, 2.04) |
| $2000+ | .33 | (.07, 1.64) | .38* | (.17, .87) | .58 | (.30, 1.12) |
| Employment[5] | | | | | | |
| Part-time | 4.10* | (1.04, 16.16) | 1.34 | (.60, 3.01) | 1.70 | (.86, 3.34) |
| Full-time | 2.05 | (.70, 5.98) | 1.30 | (.76, 2.23) | 1.53 | (.99, 2.38) |
| Family structure[6] | | | | | | |
| Steady partner | .50 | (.10, 2.37) | .39** | (.20, .79) | .74 | (.41, 1.36) |
| Cohabiting | 1.98 | (.38, 10.15) | .45 | (.20, 1.03) | .80 | (.39, 1.64) |
| Married | 1.21 | (.30, 4.88) | .53 | (.27, 1.04) | 1.11 | (.62, 1.99) |
| Age of sexual debut[7] | | | | | | |
| 13-15 | .15* | (.03, .64) | .85 | (.28, 2.53) | .71 | (.28, 1.79) |
| 16-17 | .05*** | (.01, .26) | .59 | (.19, 1.78) | .55 | (.22, 1.40) |
| 18+ | .12* | (.02, .60) | .59 | (.18, 1.92) | .61 | (.23, 1.63) |
| Birth control first sex | .39 | (.10, 1.46) | .83 | (.44, 1.56) | 1.04 | (.63, 1.71) |
| Condom use first sex | 1.15 | (.38, 3.53) | .75 | (.41, 1.38) | .96 | (.59, 1.55) |
| Believes it's his/her job to | .19** | (.06, .61) | .60 | (.27, 1.36) | .58 | (.29, 1.18) |

| | | | | | | |
|---|---|---|---|---|---|---|
| teach child about sex | | | | | | |
| Religious attendance[8] | | | | | | |
| Once or twice a month | 1.25 | (.29, 5.51) | 2.31* | (1.17, 4.55) | 1.49 | (.82, 2.73) |
| Once a week or more | 1.23 | (.36, 4.14) | .91 | (.50, 1.63) | 1.21 | (.75, 1.95) |
| Believes religion is very important | 1.45 | (.27, 7.83) | .55 | (.28, 1.10) | .50* | (.27, .90) |
| Site[9] | | | | | | |
| Atlanta | .43 | (.13, 1.42) | .45** | (.25, .82) | .82 | (.51, 1.32) |
| Little Rock | .61 | (.21, 1.82) | 1.46 | (.84, 2.54) | 1.17 | (.74, 1.84) |
| Log-likelihood | -872.05 | | | | | |
| AIC[10] | 2.29 | | | | | |
| BIC[11] | -3296.77 | | | | | |
| Maximum likelihood $R^2$ | .18 | | | | | |
| McFadden's $R^2$ | .09 | | | | | |
| Cragg & Uhler's $R^2$ | .20 | | | | | |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Class 4 (a healthy and low-risk lifestyle) is the reference category.

[2] Male is the reference category.

[3] Less than a high school diploma or GED is the reference category.

[4] $0-499 is the reference category.

[5] Other employment status (e.g. student, unemployed) is the reference category.

[6] No steady partner is the reference category.

[7] 12 or younger is the reference category.

[8] Never or a few times a year is the reference category.

[9] Athens is the reference category.

[10] Akaike Information Criterion

[11] Bayesian Information Criterion

Parents were four times more likely to belong to Class 2, the class marked by not believing teenagers should know how to use condoms and birth control before having sex, if they worked part-time (as compared to belonging to the "other" category of employment). However, making $500-999 (versus less than that) decreased the risk of membership by 92%, having sex after age 13 decreased the risk of membership by 85-95%, and believing it is his/her job to teach his/her child about sex decreased the risk of membership by 81%. Factors that reduced the likelihood of membership in Class 3, the unhealthy and high stress class with some sexual risk, included age (6% decrease), attending some college or earning an AA or college degree (as compared to not receiving a high school diploma) (56-66% decrease), having a family income of $2,000 or more a month (versus making less than $500 a month) (62% decrease), having a steady partner rather than no partner (61% decrease), and living in Atlanta instead of Athens (55% decrease). However, attending a religious service once or twice a month (as compared to never or a few times a year) more than doubled the risk of membership in Class 3. Religion was also significantly associated with membership in Class 4, the unhealthy and low stress class with lower sexual risk. In this case, parents who believed religion is important were half as likely to belong to Class 4.

One clear trend is apparent for both children and parents: individual social factors matter only for particular classes. In fact, for both children and parents no variable was significantly associated with the risk of belonging to all three sub-optimal health lifestyles. For example, girls had a lower risk of belonging to the healthy and high-risk lifestyle (Class 4), but sex was not associated with membership in Class 2 or Class 3. Likewise for parents, religious variables decreased the likelihood of membership in Class 3 or Class 4, but they were not associated with membership in Class 2.

An unexpected finding is the differing role played by socioeconomic (SES) variables in the health lifestyles of children and their parents. Children of parents with some college or an AA/technical degree were twice as likely to belong to Class 3 instead of Class 1, children whose families made $500 or more per month had three to four times the risk of membership in Class 2, and children of parents who were employed part-time or full-time were three to six times more likely to belong to Class 4. These relationships are contrary to expectations that children whose parents are more educated and wealthier will have healthier lifestyles. The employment finding may be due to the increased time alone children of parents working part-time or full-time may have had to engage in high-risk behavior, but the education and income findings are harder to explain. For parents (Table 6.12), on the other hand, the relationship between SES and health lifestyles went in the expected direction, although full-time employment was not significant. Attending some college or receiving a degree, as compared to not earning a high school diploma, halved the odds of belonging to Class 3. For monthly income, making $500-999 per month versus less than $500 per month decreased the likelihood of belonging to Class 2 by 92%, while earning $2,000 a month or more decreased the risk of membership in Class 3 by 62%. These contradictory findings for children and parents illustrate that the influence of social factors varies by health lifestyle as well as by developmental stage.

**Question 3*:* Are baseline health lifestyles associated with future sexual health behaviors, such as perceived odds of having sex within the next year (for preadolescents) and number of sexual partners (for adults)?**

Table 6.11 presents the adjusted odds ratios (OR) for the likelihood children believed they would have sex the next year at baseline, one-year follow-up, and three-year follow-up (see Table A.4 in the Appendix for the unadjusted OR). Figure 6.3 shows the probability of a child believing he or she would have sex within the next year over time, fully adjusted for all child covariates and stratified by baseline latent class.

**Table 6.11: Adjusted Odds Ratios (OR) Using Logistic Regression of the Likelihood Children Will Have Sex Within the Next Year (Parents Matter! Data, 2001-2006)**

| | Baseline[1] (N = 887) | | 1-Year Follow-Up[1] (N = 715) | | 3-Year Follow-Up[1] (N = 594) | |
|---|---|---|---|---|---|---|
| **Variable** | **Adjusted OR** | **(95% CI)** | **Adjusted OR** | **(95% CI)** | **Adjusted OR** | **(95% CI)** |
| Child latent class at baseline[2] | | | | | | |
| 2 | 2.87* | (1.06, 7.75) | 4.10** | (1.56, 10.77) | 2.23* | (1.02, 4.87) |
| 3 | .81 | (.35, 1.86) | 2.46* | (1.16, 5.19) | 1.18 | (.69, 2.04) |
| 4 | 10.79*** | (3.46, 33.60) | 4.13* | (1.27, 13.36) | 3.34* | (1.01, 11.02) |
| Intervention group[3] | | | | | | |
| Brief | .64 | (.29, 1.41) | .61 | (.31, 1.18) | .93 | (.53, 1.62) |
| Enhanced | .65 | (.30, 1.39) | .50* | (.26, .98) | 1.08 | (.63, 1.84) |
| Female[4] | .51* | (.26, 1.00) | .27*** | (.15, .47) | .30*** | (.19, .46) |
| Child age | .99 | (.62, 1.57) | 1.78** | (1.16, 2.72) | 1.38 | (.96, 1.97) |
| Grade[5] | 1.71 | (.76, 3.82) | .86 | (.56, 1.33) | 1.23 | (.86, 1.74) |
| Parent education[6] | | | | | | |
| High school diploma/GED | .82 | (.35, 1.89) | .44* | (.21, .92) | .74 | (.38, 1.44) |
| Some college | .49 | (.17, 1.39) | .20** | (.08, .52) | .69 | (.33, 1.43) |
| AA/technical degree | .77 | (.24, 2.53) | .30* | (.11, .82) | .89 | (.38, 2.06) |
| College degree or higher | .63 | (.17, 2.32) | .76 | (.30, 1.95) | .85 | (.36, 2.05) |
| Monthly family income[7] | | | | | | |
| $500-999 | 1.69 | (.60, 4.73) | 1.53 | (.61, 3.84) | .72 | (.31, 1.65) |
| $1000-1999 | 1.93 | (.62, 6.04) | 1.88 | (.72, 4.93) | .91 | (.40, 2.06) |
| $2000+ | 2.19 | (.62, 7.77) | 2.53 | (.89, 7.20) | 1.30 | (.54, 3.10) |
| Parent employment[8] | | | | | | |
| Part-time | .35 | (.11, 1.14) | .93 | (.35, 2.46) | .85 | (.37, 1.90) |
| Full-time | .42* | (.19, .90) | .75 | (.39, 1.43) | .79 | (.45, 1.38) |
| Family structure[9] | | | | | | |
| Steady partner | 1.19 | (.45, 3.12) | .87 | (.40, 1.94) | 1.14 | (.61, 2.11) |
| Cohabiting | 1.04 | (.34, 3.25) | 1.23 | (.51, 2.97) | 2.07 | (.92, 4.66) |
| Married | .68 | (.25, 1.87) | 1.24 | (.60, 2.56) | 1.07 | (.61, 1.90) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Religious attendance[10] | | | | | | |
| Once or twice a month | 2.29 | (.86, 6.11) | .91 | (.40, 2.07) | 1.24 | (.63, 2.46) |
| Once a week or more | 2.55* | (1.07, 6.04) | 1.37 | (.68, 2.76) | 1.03 | (.59, 1.79) |
| Does well on schoolwork | .64 | (.33, 1.23) | .59 | (.35, 1.01) | .49** | (.32, .76) |
| Happy in the past month | .47 | (.22, 1.01) | .80 | (.44, 1.47) | .59* | (.37, .94) |
| Peers who have had sex[11] | | | | | | |
| Only a few | 1.70 | (.75, 3.86) | 2.94** | (1.46, 5.91) | 5.18* | (1.43, 18.78) |
| About half or more | 4.45*** | (1.98, 9.98) | 7.56*** | (3.67, 15.55) | 18.03*** | (5.13, 63.33) |
| Believes parent think s/he should wait to have sex[12] | .80 | (.37, 1.76) | .54 | (.29, 1.02) | .55* | (.32, .95) |
| Parent believes no sex before marriage[13] | | | | | | |
| A little true | .66 | (.28, 1.55) | .97 | (.45, 2.09) | .44* | (.23, .82) |
| Very true | .67 | (.29, 1.52) | .93 | (.45, 1.94) | .48* | (.26, .89) |
| Site[14] | | | | | | |
| Atlanta | 1.09 | (.47, 2.57) | 1.40 | (.64, 3.06) | .79 | (.42, 1.47) |
| Little Rock | .81 | (.37, 1.81) | 1.46 | (.74, 2.89) | .98 | (.58, 1.65) |
| Log-likelihood | -156.15 | | -200.91 | | -271.66 | |
| AIC[15] | .45 | | .68 | | 1.06 | |
| BIC[16] | -5423.42 | | -4021.32 | | -2982.24 | |
| Maximum likelihood $R^2$ | .12 | | .18 | | .26 | |
| McFadden's $R^2$ | .26 | | .26 | | .24 | |
| Cragg & Uhler's $R^2$ | .31 | | .33 | | .36 | |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Time-varying covariates (i.e. all variables except for baseline latent class, gender, race, parent's education, and site) are matched with each time point. For instance, child's grade level at the one-year follow-up time point is used in that analysis rather than the child's grade level at baseline.

[2] Class 1 (a healthy and low-risk lifestyle) is the reference category.

[3] General Intervention is the reference category.

[4] Male is the reference category.

[5] 4th grade is the reference category, and 5th grade is the indicator value.

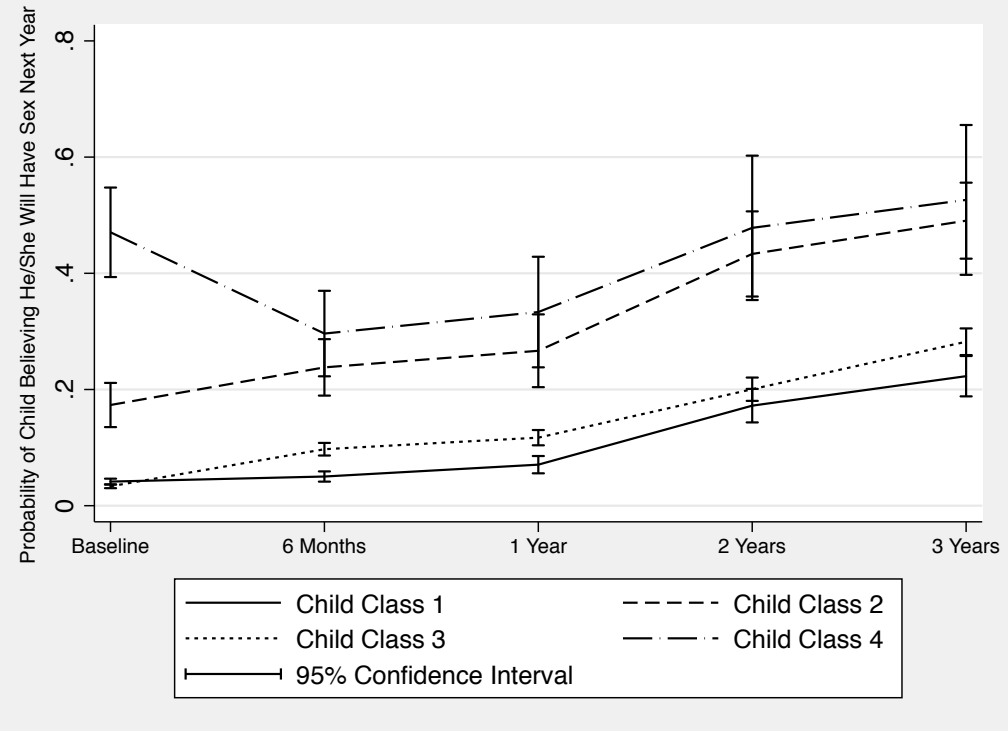
[6] Less than a high school diploma or GED is the reference category.

[7] $0-499 is the reference category.

[8] Other employment status (e.g. student, unemployed) is the reference category.

[9] No steady partner is the reference category.
[10] Never or a few times a year is the reference category.
[11] None is the reference category.
[12] Not at all or a little true is the reference category.
[13] Not at all true is the reference category.
[14] Athens is the reference category.
[15] Akaike Information Criterion
[16] Bayesian Information Criterion

**Figure 6.3: Probability of Child Believing He or She Will Have Sex Next Year by Child Latent Class at Baseline, Adjusted for All Child Covariates (Parents Matter! Data, 2001-2006)**




Key findings in Table 6.11 are that membership in the high-risk Class 2 or Class 4 was associated with increased odds of children believing they would have sex within the next year. Children in these classes were still two to three times more likely to believe they would have sex within the next year even three years after the baseline latent class was determined. Girls were consistently half to a third as likely as boys to believe they would have sex within the next year, and other variables like child age, parent education, parent employment, religious attendance, doing well on schoolwork, being happy in the past month, and perceived and actual parent norms about sex mattered intermittently throughout the three time points. Peer sexual norms maintained a significant association with children believing they would have sex within the next year, as those children who

believed their peers had had sex were three to 18 times more likely to answer “yes” to the dependent variable versus children who thought none of their peers had had sex. Figure 6.3 illustrates that belonging to one of the higher-risk classes at baseline continued to significantly predict sexual outcomes three years later.

Table 6.12 shows the adjusted OR for whether children reported touching another child’s “private parts” or being touched at baseline, one-year follow-up, and three-year follow-up (see Table A.5 in the Appendix for the unadjusted OR), while Figure 6.4 depicts the probability of a child reporting touching another child’s “private parts” or being touched over time, fully adjusted for all child covariates and stratified by baseline latent class.

**Table 6.12: Adjusted Odds Ratios (OR) Using Logistic Regression of Whether Children Have Willingly Touched Boy/Girlfriend's "Private Parts" or Been Touched (Parents Matter! Data, 2001-2006)**

| | Baseline[1] (N = 889) | | 1-Year Follow-Up[1] (N = 715) | | 3-Year Follow-Up[1] (N = 594) | |
|---|---|---|---|---|---|---|
| **Variable** | **Adjusted OR** | **(95% CI)** | **Adjusted OR** | **(95% CI)** | **Adjusted OR** | **(95% CI)** |
| Child latent class at baseline[2] | | | | | | |
| 2 | 12.40** | (2.06, 74.60) | 2.00 | (.58, 6.90) | 3.27** | (1.40, 7.63) |
| 3 | 1.86 | (.36, 9.52) | .95 | (.36, 2.47) | 1.00 | (.54, 1.88) |
| 4 | 6.00 | (.87, 41.37) | 11.30*** | (3.01, 42.42) | 3.90* | (1.12, 13.57) |
| Intervention group[3] | | | | | | |
| Brief | 1.17 | (.36, 3.80) | 1.39 | (.56, 3.48) | .99 | (.53, 1.84) |
| Enhanced | .38 | (.10, 1.44) | 1.33 | (.54, 3.28) | 1.00 | (.54, 1.85) |
| Female[4] | .18** | (.06, .58) | .77 | (.38, 1.53) | .31*** | (.18, .52) |
| Child age | 1.16 | (.57, 2.36) | 1.63 | (.95, 2.81) | 2.08*** | (1.38, 3.13) |
| Grade[5] | 3.57 | (.97, 13.14) | .96 | (.54, 1.71) | 1.10 | (.75, 1.62) |
| Parent education[6] | | | | | | |
| High school diploma/GED | .79 | (.21, 3.01) | .75 | (.27, 2.11) | .44* | (.20, .96) |
| Some college | .37 | (.06, 2.24) | .74 | (.24, 2.29) | .66 | (.29, 1.49) |
| AA/technical degree | 1.82 | (.38, 8.79) | 1.46 | (.43, 4.93) | .58 | (.22, 1.50) |
| College degree or higher | 1.86 | (.33, 10.37) | .38 | (.08, 1.68) | .69 | (.26, 1.87) |
| Monthly family income[7] | | | | | | |
| $500-999 | .62 | (.11, 3.30) | 2.03 | (.56, 7.41) | .71 | (.26, 1.97) |
| $1000-1999 | 1.12 | (.20, 6.32) | 1.54 | (.40, 5.94) | 1.05 | (.38, 2.86) |
| $2000+ | 1.03 | (.15, 7.14) | 4.47 | (.59, 10.34) | 1.93 | (.67, 5.59) |
| Parent employment[8] | | | | | | |
| Part-time | .44 | (.07, 2.72) | 1.45 | (.43, 4.86) | 1.31 | (.50, 3.42) |
| Full-time | 1.11 | (.34, 3.59) | 1.25 | (.55, 2.87) | 1.41 | (.73, 2.74) |
| Family structure[9] | 1.16 | (.29, 4.70) | .73 | (.28, 1.90) | 1.24 | (.61, 2.51) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Steady partner | 1.01 | (.18, 5.53) | .26 | (.07, 1.07) | .82 | (.41, 2.15) |
| Cohabiting | .39 | (.08, 1.79) | .64 | (.26, 1.57) | 1.06 | (.56, 2.04) |
| Married | | | | | | |
| Religious attendance[10] | | | | | | |
| Once or twice a month | .61 | (.14, 2.61) | .53 | (.17, 1.70) | 1.18 | (.53, 2.64) |
| Once a week or more | .82 | (.24, 2.80) | 1.28 | (.55, 3.01) | 1.44 | (.75, 2.76) |
| Does well on schoolwork | .44 | (.16, 1.23) | .60 | (.30, 1.23) | .66 | (.40, 1.08) |
| Happy in the past month | .88 | (.28, 2.78) | .93 | (.43, 2.02) | .59 | (.35, 1.00) |
| Peers who have had sex[11] | | | | | | |
| Only a few | 5.26* | (1.48, 18.64) | 4.53** | (1.66, 12.38) | 6.32 | (.76, 52.40) |
| About half or more | 15.03*** | (3.94, 57.38) | 5.98** | (2.14, 16.72) | 30.73** | (3.95, 239.27) |
| Believes parent think s/he should wait to have sex | .53 | (.18, 1.54) | .96 | (.39, 2.39) | .88 | (.48, 1.64) |
| Parent believes no sex before marriage[12] | | | | | | |
| A little true | 1.09 | (.26, 4.54) | .93 | (.36, 2.37) | .82 | (.39, 1.72) |
| Very true | 2.48 | (.61, 10.07) | .47 | (.18, 1.21) | .81 | (.39, 1.68) |
| Site[13] | | | | | | |
| Atlanta | .17* | (.04, .74) | 1.20 | (.44, 3.24) | 1.04 | (.51, 2.12) |
| Little Rock | .47 | (.16, 1.40) | 1.09 | (.45, 2.66) | .88 | (.48, 1.60) |
| Log-likelihood | -76.59 | | -132.03 | | -220.31 | |
| AIC[14] | .27 | | .49 | | .88 | |
| BIC[15] | -5598.03 | | -4159.09 | | -3084.94 | |
| Maximum likelihood $R^2$ | .10 | | .10 | | .23 | |
| McFadden's $R^2$ | .37 | | .21 | | .26 | |
| Cragg & Uhler's $R^2$ | .40 | | .26 | | .37 | |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Time-varying covariates (i.e. all variables except for baseline latent class, gender, race, parent's education, and site) are matched with each time point. For instance, child's grade level at the one-year follow-up time point is used in that analysis rather than the child's grade level at baseline.

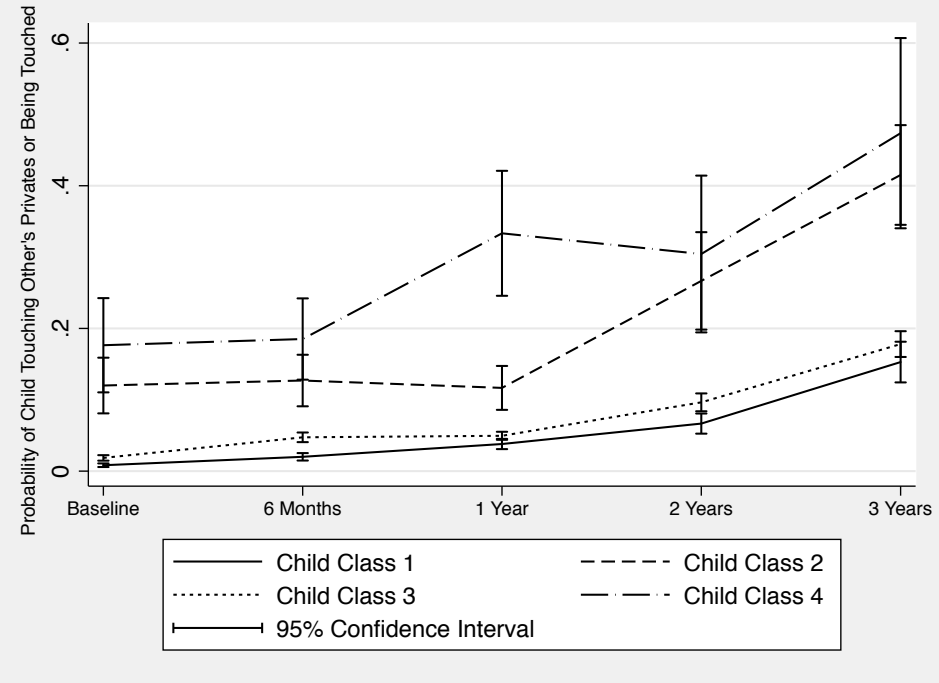
[2] Class 1 (a healthy and low-risk lifestyle) is the reference category.

[3] General Intervention is the reference category.

[4] Male is the reference category.

[5] 4th grade is the reference category, and 5th grade is the indicator value.
[6] Less than a high school diploma or GED is the reference category.
[7] $0-499 is the reference category.
[8] Other employment status (e.g. student, unemployed) is the reference category.
[9] No steady partner is the reference category.
[10] Never or a few times a year is the reference category.
[11] None is the reference category.
[12] Not at all true is the reference category.
[13] Athens is the reference category.
[14] Akaike Information Criterion
[15] Bayesian Information Criterion

**Figure 6.4: Probability of Child Touching Boyfriend/Girlfriend's "Private Parts" or Being Touched Over Time by Child Latent Class at Baseline, Adjusted for All Child Covariates (Parents Matter! Data, 2001-2006)**




Similar findings can be seen for whether children reported touching another child's "private parts" or being touched (Table 6.12 and Figure 6.4), although parent norms lost all significance. Once again females were generally significantly less likely to engage in the outcome variable, while peer sexual norms were strongly associated with an increased likelihood (five to 31 times more likely) across the time points. It should be noted that the peer sexual norm and latent class estimates were unstable at times (as can be seen by the wide confidence intervals). While the odds ratios themselves may not be exact, the numbers still provide evidence of a general trend of greater peer participation in sex and membership in certain classes being associated with greater child involvement in sexual behaviors. Figure 6.4 demonstrates a pattern similar to the one observed in Figure 6.3.

The following two tables examine sexual outcomes for parents, showing the adjusted OR for whether parents had multiple sexual partners in the past six months (Table 6.13) or risky birth control use (Table 6.14) at baseline, one-year follow-up, and three-year follow-up (see Tables A.6-7 in the Appendix for the unadjusted OR):

**Table 6.13: Adjusted Odds Ratios (OR) Using Logistic Regression of Whether Parents Have Had Multiple Sexual Partners in the Past Six Months[1] (Parents Matter! Data, 2001-2006)**

| | Baseline[2] (N = 849) | | 1-Year Follow-Up[2] (N = 685) | | 3-Year Follow-Up[2] (N = 367) | |
|---|---|---|---|---|---|---|
| **Variable** | **Adjusted OR** | **(95% CI)** | **Adjusted OR** | **(95% CI)** | **Adjusted OR** | **(95% CI)** |
| Parent latent class at baseline[3] | | | | | | |
| 2 | 10.65 | (.84, 134.89) | 6.58* | (1.22, 35.46) | Empty | Empty |
| 3 | 28.78** | (3.71, 223.03) | 8.45** | (2.34, 30.47) | 3.49 | (.29, 42.43) |
| 4 | 3.63 | (.46, 28.79) | 2.89 | (.82, 10.15) | 2.35 | (.21, 26.20) |
| Intervention group[4] | | | | | | |
| Brief | .81 | (.36, 1.81) | .85 | (.42, 1.71) | .39 | (.08, 1.97) |
| Enhanced | .73 | (.33, 1.63) | .95 | (.49, 1.85) | .16* | (.03, .95) |
| Female[5] | .32 | (.05, 2.01) | .62 | (.11, 3.40) | Omitted | Omitted |
| Parent age | .95 | (.90, 1.01) | .97 | (.93, 1.02) | .95 | (.86, 1.05) |
| Education[6] | | | | | | |
| High school diploma/GED | .91 | (.39, 2.13) | .98 | (.47, 2.02) | 5.85 | (.88, 39.12) |
| Some college | 1.71 | (.63, 4.67) | .79 | (.31, 2.04) | Empty | Empty |
| AA/technical degree | 1.27 | (.35, 4.59) | 1.26 | (.45, 3.57) | 3.81 | (.30, 48.63) |
| College degree or higher | 1.72 | (.38, 7.79) | .49 | (.12, 2.05) | 6.58 | (.51, 85.24) |
| Monthly family income[7] | | | | | | |
| $500-999 | .69 | (.29, 1.64) | .47 | (.21, 1.06) | 4.13 | (.38, 45.27) |
| $1000-1999 | .50 | (.19, 1.34) | .44 | (.19, 1.05) | 1.82 | (.12, 28.39) |
| $2000+ | .17* | (.04, .77) | .49 | (.17, 1.45) | 4.01 | (.24, 67.10) |
| Employment[8] | | | | | | |
| Part-time | 1.04 | (.38, 2.87) | .60 | (.20, 1.75) | 1.10 | (.16, 7.73) |
| Full-time | .83 | (.36, 1.88) | .71 | (.35, 1.44) | .14* | (.02, .90) |
| Family structure[9] | .71 | (.30, 1.69) | .96 | (.47, 1.93) | 2.12 | (.34, 13.35) |
| Steady partner | .53 | (.18, 1.58) | .33* | (.12, .89) | .40 | (.03, 6.35) |
| Cohabiting | .40 | (.15, 1.08) | .36* | (.16, .82) | .29 | (.03, 2.74) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Married | | | | | | |
| Age of sexual debut[10] | | | | | | |
| 13-15 | .46 | (.14, 1.52) | .41 | (.47, 1.93) | .79 | (.04, 16.25) |
| 16-17 | .25* | (.07, .91) | .26* | (.12, .89) | .22 | (.01, 5.14) |
| 18+ | .45 | (.11, 1.83) | .22* | (.16, .82) | .27 | (.01, 9.32) |
| Birth control first sex | 1.27 | (.46, 3.51) | .65 | (.28, 1.52) | .14 | (.02, 1.06) |
| Condom use first sex | .37 | (.14, 1.00) | .87 | (.40, 1.89) | 5.68 | (.79, 40.80) |
| Believes it's his/her job to teach child about sex | .71 | (.27, 1.88) | .96 | (.41, 2.25) | Omitted | Omitted |
| Religious attendance[11] | | | | | | |
| Once or twice a month | 3.03* | (1.29, 8.43) | 1.09 | (.52, 2.30) | 2.70 | (.28, 26.34) |
| Once a week or more | 3.01* | (1.12, 8.04) | .85 | (.43, 1.69) | 2.90 | (.40, 20.84) |
| Believes religion is very important | .70 | (.29, 1.70) | 1.04 | (.49, 2.22) | 1.14 | (.13, 10.04) |
| Site[12] | | | | | | |
| Atlanta | .74 | (.33, 1.69) | .72 | (.34, 1.53) | .67 | (.08, 5.39) |
| Little Rock | .34* | (.14, .79) | .89 | (.44, 1.80) | 1.05 | (.21, 5.25) |
| Log-likelihood | -137.41 | | -186.24 | | -39.04 | |
| AIC[13] | .42 | | .66 | | .43 | |
| BIC[14] | -5181.12 | | -3838.99 | | -1852.97 | |
| Maximum likelihood $R^2$ | .13 | | .12 | | .09 | |
| McFadden's $R^2$ | .30 | | .18 | | .31 | |
| Cragg & Uhler's $R^2$ | .35 | | .24 | | .34 | |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Having multiple sexual partners is defined as having two or more partners in the past six months.

[2] Time-varying covariates (i.e. all variables except for baseline latent class, gender, race, parent's education, and site) are matched with each time point. For instance, child's grade level at the one-year follow-up time point is used in that analysis rather than the child's grade level at baseline.

[3] Class 1 (a healthy and lower-risk lifestyle) is the reference category.

[4] General Intervention is the reference category.

[5] Male is the reference category.

[6] Less than a high school diploma or GED is the reference category.

[7] $0-499 is the reference category.

[8] Other employment status (e.g. student, unemployed) is the reference category.

[9] No steady partner is the reference category.
[10] Age 12 or younger is the reference category.
[11] Never or a few times a year is the reference category.
[12] Athens is the reference category.
[13] Akaike Information Criterion
[14] Bayesian Information Criterion

**Table 6.14: Adjusted Odds Ratios (OR) Using Logistic Regression of Whether Parents Have Risky Birth Control Use[1] (Parents Matter! Data, 2001-2006)**

| | Baseline[2] (N = 870) | | 1-Year Follow-Up[2] (N = 691) | | 3-Year Follow-Up[2] (N = 568) | |
|---|---|---|---|---|---|---|
| **Variable** | **Adjusted OR** | **(95% CI)** | **Adjusted OR** | **(95% CI)** | **Adjusted OR** | **(95% CI)** |
| Parent latent class at baseline[3] | | | | | | |
| 2 | 1.99 | (.82, 4.78) | 2.63 | (.97, 7.17) | 1.50 | (.40, 5.53) |
| 3 | 3.39*** | (2.11, 5.46) | 2.63** | (1.52, 4.54) | 2.10* | (1.13, 3.90) |
| 4 | 1.92** | (1.31, 2.81) | 1.99** | (1.26, 3.15) | 2.30** | (1.36, 3.89) |
| Intervention group[4] | | | | | | |
| Brief | .84 | (.59, 1.19) | 1.11 | (.73, 1.68) | .95 | (.60, 1.53) |
| Enhanced | .94 | (.66, 1.33) | 1.12 | (.75, 4.54) | .83 | (.53, 1.29) |
| Female[5] | .56 | (.24, 1.30) | 1.17 | (.47, 2.90) | .76 | (.27, 2.15) |
| Parent age | .98* | (.96, 1.00) | .99 | (.97, 1.01) | .95** | (.93, .98) |
| Education[6] | | | | | | |
| High school diploma/GED | .55** | (.37, .83) | 1.05 | (.65, 1.71) | 1.55 | (.88, 2.73) |
| Some college | .69 | (.43, 1.10) | 1.05 | (.60, 1.85) | 1.68 | (.88, 3.19) |
| AA/technical degree | .52* | (.30, .89) | 1.06 | (.56, 2.00) | 2.15* | (1.03, 4.50) |
| College degree or higher | .50* | (.28, .90) | .80 | (.41, 1.57) | 1.08 | (.50, 2.33) |
| Monthly family income[7] | 1.07 | (.66, 1.72) | 1.13 | (.64, 2.00) | .94 | (.47, 1.86) |

| | | | | | | |
|---|---|---|---|---|---|---|
| $500-999 | 1.04 | (.64, 1.69) | .90 | (.50, 1.63) | .74 | (.37, 1.48) |
| $1000-1999 | 1.09 | (.64, 1.86) | 1.14 | (.60, 2.18) | 1.14 | (.55, 2.37) |
| $2000+ | | | | | | |
| Employment[8] | | | | | | |
| Part-time | 1.47 | (.89, 2.44) | 1.05 | (.58, 1.92) | .66 | (.32, 1.38) |
| Full-time | 1.29 | (.90, 1.84) | 1.08 | (.71, 1.63) | 1.26 | (.78, 2.02) |
| Family structure[9] | | | | | | |
| Steady partner | 2.28** | (1.43, 3.63) | 1.36 | (.83, 2.21) | 1.17 | (.68, 2.00) |
| Cohabiting | 3.03*** | (1.75, 5.24) | 2.66** | (1.49, 4.76) | 2.51** | (1.27, 4.93) |
| Married | 3.81*** | (2.40, 6.04) | 3.02*** | (1.89, 4.82) | 2.49*** | (1.52, 4.08) |
| Age of sexual debut[10] | | | | | | |
| 13-15 | .95 | (.48, 1.88) | 1.01 | (.46, 2.22) | .72 | (.30, 1.77) |
| 16-17 | 1.10 | (.55, 2.18) | 1.18 | (.53, 2.60) | .78 | (.32, 1.89) |
| 18+ | 1.65 | (.79, 3.45) | 1.25 | (.54, 2.87) | 1.28 | (.50, 3.24) |
| Birth control first sex | .93 | (.62, 1.39) | .79 | (.49, 1.27) | .69 | (.40, 1.18) |
| Condom use first sex | .87 | (.59, 1.28) | .92 | (.59, 1.44) | .97 | (.58, 1.62) |
| Believes it's his/her job to teach child about sex | 1.03 | (.64, 1.67) | .92 | (.53, 1.60) | .67 | (.36, 1.24) |
| Religious attendance[11] | | | | | | |
| Once or twice a month | .75 | (.48, 1.17) | .86 | (.52, 1.52) | .72 | (.40, 1.30) |
| Once a week or more | .67* | (.46, .99) | 1.40 | (.92, 2.14) | .92 | (.57, 1.51) |
| Believes religion is very important | .85 | (.56, 1.28) | .84 | (.51, 1.39) | .82 | (.46, 1.46) |
| Site[12] | | | | | | |
| Atlanta | .82 | (.56, 1.20) | .63* | (.39, .99) | .90 | (.54, 1.50) |
| Little Rock | .98 | (.69, 1.41) | .90 | (.60, 1.36) | 1.16 | (.74, 1.81) |
| Log-likelihood | -550.48 | | -437.51 | | -351.24 | |
| AIC[13] | 1.36 | | 1.38 | | 1.38 | |
| BIC[14] | -4516.89 | | -3381.31 | | -2646.15 | |
| Maximum likelihood $R^2$ | .11 | | .10 | | .13 | |
| McFadden's $R^2$ | .09 | | .08 | | .10 | |
| Cragg & Uhler's $R^2$ | .15 | | .13 | | .17 | |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] High-risk birth control use refers to individuals who are not using birth control (women aged 50 or older are coded as low-risk, due to menopause). There is information about whether respondents are trying to get pregnant in subsequent time points, but that information was not available at time 1.
[2] Time-varying covariates (i.e. all variables except for baseline latent class, gender, race, parent's education, and site) are matched with each time point. For instance, child's grade level at the one-year follow-up time point is used in that analysis rather than the child's grade level at baseline.
[3] Class 1 (a healthy and lower-risk lifestyle) is the reference category.
[4] General Intervention is the reference category.
[5] Male is the reference category.
[6] Less than a high school diploma or GED is the reference category.
[7] $0-499 is the reference category.
[8] Other employment status (e.g. student, unemployed) is the reference category.
[9] No steady partner is the reference category.
[10] Age 12 or younger is the reference category.
[11] Never or a few times a year is the reference category.
[12] Athens is the reference category.
[13] Akaike Information Criterion
[14] Bayesian Information Criterion

For parents, baseline latent class and a wide variety of demographic and sexual variables were associated with the odds that parents had multiple sexual partners over time (Table 6.13). For example, parents in Class 3 as compared to Class 1 were nine to 29 times as likely to have multiple partners at baseline and one-year follow-up as compared to parents in Class 1. Cohabiting or being married (rather than being single) and being 16 or older the first time parents had sex (rather than younger than 13) decreased the likelihood of having multiple partners by over a third in the first two time points. As with the analysis for children, there was evidence of unstable estimates for some variables in this analysis given the relatively few parents who had multiple sexual partners.

Baseline latent class was also associated with whether parents engaged in "high-risk" birth control use (Table 6.14), as parents in Class 3 or Class 4 were two to three times more likely than those in Class 1 to engage in that behavior. Family structure was significant as well. Parents who were cohabiting or married were approximately three times more likely than those without a steady partner to fail to use birth control even when they were not trying to become pregnant.

**Discussion**

In summary, four distinct health lifestyles emerged for both children and their parents. For children, two of these lifestyles were binary and two were bidimensional, with the relationship between general health behaviors and delinquent or sexual behaviors changing across health lifestyles. Likewise there were four health lifestyles for parents, although the binary versus bidimensional character of these lifestyles was less clear, perhaps due to the broad range of health behaviors used for parents as compared to

children, whose health behaviors mapped more directly onto health-promoting and health-compromising dimensions. It is possible to answer Question 1 in the affirmative for both children and parents, since sexual risk behaviors, intentions, and attitudes do share health lifestyles in common with more frequently studied "SNAP" behaviors, although the exact nature of this relationship depends upon the health lifestyle.

The results in answer to Question 2 were more mixed. Overall, child results seemed to negate the validity of some aspects of a bidimensional model of health lifestyles, since resources were not associated in the hypothesized direction with health-promoting lifestyles, although protective and risk factors did operate in the expected direction. Parent results also both undermined and supported the validity of a bidimensional model of health lifestyles. For instance, SES-related variables increased the likelihood of belonging to health-promoting lifestyles in the case of membership in Class 3 but not for membership in Class 4. However, experience and norm-related variables did decrease the risk of belonging to Class 2, a class marked by its attitude toward sexual behaviors, which suggests that socialization and experience may shape the *habitus* and in turn affect health lifestyles. As for Question 3, the results indicate unequivocally that yes, baseline health lifestyles are associated with future sexual health behaviors for both preadolescents and their parents, since individuals with higher-risk health lifestyles were also more likely to engage in high-risk sexual behaviors up to three years after baseline.

Two caveats should be noted in interpreting these results. First, as indicated earlier, the estimates for some variables were unstable. Second, the pseudo-$R^2$ for some of the multinomial logistic regressions and logistic regressions was relatively small (e.g. Table 6.14), which indicates a lack of model fit. However, the models did explain some variance,

and the actual pseudo-$R^2$ value differed widely depending on the precise pseudo-$R^2$ used, pointing to the unreliability of using a pseudo-$R^2$ to evaluate model fit in logistic regressions.

# Chapter 7: Results—Understanding the Development and Transmission of Health Lifestyles

The previous chapter examined the nature of health lifestyles for preadolescents and their parents, as well as what social factors and outcomes were associated with those lifestyles. This chapter focuses on the development and intergenerational transmission of health lifestyles, and Chapter 8 will assess the impact of interventions on health lifestyles and their transmission.

## Question 4: Do preadolescents and adults maintain one health lifestyle or does that lifestyle change over time?

The advantage of latent transition analysis over latent class analysis is that latent transition analysis gives researchers the ability to see how status membership changes over time. In this context, individuals who change health lifestyle statuses across time points are adopting healthier or unhealthier lifestyles. To reiterate a point made in Chapter 5, classes and statuses are not markedly different conceptually. Using the term "status" instead of "class" in latent transition analysis simply serves to highlight the fluid nature of category membership over time.

Only the log-likelihood fit statistic was available for determining the best status solution for latent transition analysis (see Table A.8 in the Appendix). However, the lifestyles and membership percentages in the four-status solution for both children and parents were similar to the four-class solution in Question 1 (see Tables 6.1 and 6.2 in the previous chapter). Thus, the four-status solution was the best option even in the absence of

comprehensive fit statistics. An unadjusted analysis of the association between child and parent status membership and a host of social factors, intervention variables, and interactions (located in Tables A.9-10 in the Appendix) provides further support for a four-class solution. For both children and parents the best-fitting baseline latent class was significantly associated with membership in the parallel status. For instance, children were more likely to belong to Status 3 if they were members of Class 3 rather than Class 1 at baseline.

Table 7.1 contains the item-response probabilities for children's health lifestyles. As a reminder, item-response probabilities indicate each class's mean level of participation in a behavior, which may also be thought of as the probability that class members engaged in that behavior.

**Table 7.1: Item-Response Probabilities for Child Health Lifestyle Indicators Used in Latent Transition Analysis at Baseline (T1) and 3-Year Follow-Up (T6) (Parents Matter! Data, 2001-2006)**

| | **Child Status 1** *Healthy and low-risk* | | **Child Status 2** *Unhealthy and high-risk* | | **Child Status 3** *Unhealthy and low-risk* | | **Child Status 4** *Healthy and high-risk* | |
|---|---|---|---|---|---|---|---|---|
| | **T1** | **T6** | **T1** | **T6** | **T1** | **T6** | **T1** | **T6** |
| | 25% | 21% | 20% | 16% | 45% | 40% | 9% | 23% |
| **Variable** | N ≈ 279 | N ≈ 234 | N ≈ 223 | N ≈ 178 | N ≈ 502 | N ≈ 446 | N ≈ 100 | N ≈ 256 |
| Eats fruits and vegetables daily | .66 | .61 | .03 | .00 | .12 | .01 | .68 | .37 |
| Consumes dairy daily | .76 | .82 | .08 | .07 | .11 | .18 | .70 | .70 |
| Eats breakfast daily | .80 | .59 | .40 | .10 | .45 | .21 | .56 | .51 |
| Engages in physical activity daily | .95 | .94 | .43 | .34 | .46 | .47 | 1.00 | .88 |
| Drinks alcohol | .02 | .08 | .47 | .69 | .09 | .24 | .46 | .54 |
| Uses tobacco | .02 | .00 | .22 | .26 | .02 | .04 | .11 | .15 |
| Uses drugs | .00 | .00 | .06 | .40 | .00 | .01 | .03 | .23 |
| Fights | .25 | .14 | .48 | .50 | .24 | .13 | .69 | .26 |
| Gets into trouble with the police | .09 | .03 | .22 | .43 | .03 | .03 | .31 | .37 |
| Has willingly touched or been touched under the clothes | .01 | .04 | .22 | .64 | .01 | .10 | .24 | .55 |
| Believes he/she should have sex until he/she is older | .87 | .84 | .64 | .31 | .87 | .80 | .63 | .36 |

Note: All variables are coded 1 = yes, 0 = no.

N= 1,115. Cases were lost to follow-up, but because LTA averages over the missing data the T6 percentages and numbers are based on the full sample.

As with the latent class analysis results, Status 1 was a healthy and low-risk lifestyle. Children in this status practiced health-promoting nutrition and exercise behaviors. For example, 80% of children in Status 1 at baseline ate breakfast daily. These children had low levels of delinquent and sexual behaviors, while 87% believed they should wait until they were older to have sex at baseline. Status 2 was the least healthy status overall, with few health-promoting behaviors and high levels of risk behaviors. For instance, only 3% of children in Status 2 at baseline ate fruits and vegetables daily, while 22% had touched or been touched under clothing. Status 3, an unhealthy but low-risk lifestyle, consisted of children who were less likely to engage in beneficial eating and exercise behaviors, but they were also unlikely to participate in delinquent or sexual behaviors. Children in Status 4, on the other hand, had a healthy but high-risk lifestyle, with 68% eating fruits and vegetables daily at baseline but 46% drinking alcohol. 25% of children had the healthiest lifestyle (Status 1) at baseline. Only 21% of the children belonged to that lifestyle at the three-year follow-up, however.[14] In comparison, membership in Status 4, the healthy but high-risk lifestyle, jumped from 9% at baseline to 23% at the three-year follow-up.

Table 7.2 contains the item-response probabilities for parents:

[14] Keep in mind that these follow-up percentages for both children and parents contain averaged values for missing data due to the nature of latent transition analysis, so they include the entire sample, even those dyads lost to follow-up.

**Table 7.2: Item-Response Probabilities for Parent Health Lifestyle Indicators Used in Latent Transition Analysis at Baseline (T1) and 3-Year Follow-Up (T6) (Parents Matter! Data, 2001-2006)**

| | **Parent Status 1** *Healthy, lower sexual risk, moderate stress* | | **Parent Status 2** *Somewhat healthy, high sexual risk, some stress* | | **Parent Status 3** *Unhealthy, some sexual risk, high stress* | | **Parent Status 4** *Unhealthy, lower sexual risk, low stress* | |
|---|---|---|---|---|---|---|---|---|
| | **T1** | **T6** | **T1** | **T6** | **T1** | **T6** | **T1** | **T6** |
| | 24% | 32% | 3% | 4% | 32% | 29% | 40% | 35% |
| **Variable** | N ≈ 268 | N ≈ 357 | N ≈ 33 | N ≈ 45 | N ≈ 357 | N ≈ 323 | N ≈ 446 | N ≈ 390 |
| Eats fruits and vegetables daily | .74 | .84 | .66 | .70 | .45 | .62 | .46 | .59 |
| Reads nutrition labels | .72 | .72 | .32 | .07 | .08 | .03 | .05 | .15 |
| Bakes, broils, or grills instead of frying | .65 | .70 | .28 | .11 | .14 | .15 | .12 | .13 |
| Engages in 20 minutes of exercise 3 times a week | .44 | .48 | .21 | .05 | .06 | .09 | .11 | .11 |
| 2 or more sex partners in the past 6 months | .02 | .02 | .04 | .04 | .14 | .06 | .02 | .01 |
| High-risk condom use | .04 | .12 | .13 | .10 | .12 | .09 | .06 | .14 |
| High-risk birth control use | .37 | .35 | .65 | .52 | .60 | .48 | .49 | .50 |
| Teens should know about birth control before sex | 1.00 | .98 | .05 | .00 | 1.00 | .99 | .99 | 1.00 |
| Teens should know about condoms | 1.00 | .98 | .15 | .00 | 1.00 | 1.00 | 1.00 | 1.00 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| before sex | | | | | | | | |
| Feels nervous or stressed out | .20 | .17 | .28 | .17 | .54 | .42 | .07 | .06 |
| Feels able to handle important things in life | .75 | .74 | .52 | .38 | .26 | .21 | .84 | .80 |

Note: All variables are coded 1 = yes, 0 = no.
N= 1,115. Cases were lost to follow-up, but because LTA averages over missing data the T6 percentages and numbers are based on the full sample.

As with children, item-response probabilities for parent statuses mirrored those for the parent classes outlined in the previous chapter. Status 1 was the healthiest lifestyle overall, with 72% of members at baseline eating fruits and vegetables daily, only 2% having multiple sexual partners, and 75% feeling able to handle the important things in life. Status 2, like Class 2, was marked by low levels of agreement with the statements that teens should know about birth control (5%) and condoms (15%) before having sex. Parents in Status 3 exhibited unhealthy behaviors and high stress levels, with some sexual risk. For example, only 6% exercised at least three times a week, 12% had high-risk condom use, and 54% reported feeling nervous or stressed at baseline. Status 4, on the other hand, included parents who were unhealthy but had lower rates of sexual behaviors and less stress. At baseline only 46% ate fruits and vegetables daily, but just 2% had multiple sexual partners and 7% felt nervous or stressed. 24% of parents began in the healthiest lifestyle, Status 1, and this number increased to 32% at the three-year follow-up. In general, children adopted less healthy lifestyles, while parents embraced healthier lifestyles, with one exception. Child membership in Status 2, the unhealthy and high-risk lifestyle, dropped from 20% to 16% over time.

The fact that health lifestyle transitions occurred from baseline to the three-year follow-up begs the question of how and when these transitions took place. Tables 7.3 (children) and 7.4 (parents) offer another perspective for understanding how health lifestyles change over time. These tables contain *tau* estimates, or the probability that members of one status transitioned to another status. Whereas the percentages in Tables 7.1 and 7.2 only show the overall changes in status membership, Tables 7.3 and 7.4 track how individual lifestyles change over time.

**Table 7.3: Transition Probabilities (Tau Estimates) for Child Health Lifestyle Statuses from Baseline to 3 Years Post-Intervention (Parents Matter! Data, 2001-2006)**

| Status | Time Point | **Child Status 1** *Healthy and low-risk* | **Child Status 2** *Unhealthy and high-risk* | **Child Status 3** *Unhealthy and low-risk* | **Child Status 4** *Healthy and high-risk* |
|---|---|---|---|---|---|
| **1** | Baseline | 1.00 (25%) | --- | --- | --- |
| | 6 Months | .72 | .01 | .21 | .05 |
| | 1 Year | .79 | .01 | .20 | .00 |
| | 2 Years | .72 | .01 | .20 | .07 |
| | 3 Years | .65 (21%) | .01 | .33 | .02 |
| **2** | Baseline | --- | 1.00 (20%) | --- | --- |
| | 6 Months | .01 | .60 | .04 | .35 |
| | 1 Year | .03 | .80 | .00 | .17 |
| | 2 Years | .00 | .74 | .08 | .18 |
| | 3 Years | .00 | .69 (16%) | .00 | .31 |
| **3** | Baseline | --- | --- | 1.00 (45%) | --- |
| | 6 Months | .23 | .00 | .72 | .05 |
| | 1 Year | .12 | .02 | .83 | .03 |
| | 2 Years | .14 | .04 | .77 | .05 |
| | 3 Years | .08 | .03 | .84 (40%) | .05 |
| **4** | Baseline | --- | --- | --- | 1.00 (9%) |
| | 6 Months | .03 | .44 | .00 | .53 |
| | 1 Year | .00 | .30 | .00 | .70 |
| | 2 Years | .03 | .18 | .12 | .67 |
| | 3 Years | .05 | .11 | .00 | .84 (23%) |

**Table 7.4: Transition Probabilities (Tau Estimates) for Parent Health Lifestyle Statuses from Baseline to 3 Years Post-Intervention (Parents Matter! Data, 2001-2006)**

| Status | Time Point | **Parent Status 1** *Healthy, lower sexual risk, moderate stress* | **Parent Status 2** *Somewhat healthy, high sexual risk, some stress* | **Parent Status 3** *Unhealthy, some sexual risk, high stress* | **Parent Status 4** *Unhealthy, lower sexual risk, low stress* |
|---|---|---|---|---|---|
| **1** | Baseline | 1.00 (24%) | --- | --- | --- |
| | 6 Months | .92 | .00 | .00 | .07 |
| | 1 Year | .95 | .00 | .01 | .03 |
| | 2 Years | .94 | .02 | .00 | .03 |
| | 3 Years | .98 (32%) | .00 | .00 | .01 |
| **2** | Baseline | --- | 1.00 (3%) | --- | --- |
| | 6 Months | .26 | .36 | .32 | .06 |
| | 1 Year | .06 | .51 | .26 | .18 |
| | 2 Years | .03 | .55 | .13 | .29 |
| | 3 Years | .98 | .41 (4%) | .00 | .00 |
| **3** | Baseline | --- | --- | 1.00 (32%) | --- |
| | 6 Months | .07 | .04 | .81 | .07 |
| | 1 Year | .01 | .02 | .97 | .00 |
| | 2 Years | .04 | .04 | .87 | .05 |
| | 3 Years | .01 | .03 | .96 (29%) | .00 |
| **4** | Baseline | --- | --- | --- | 1.00 (40%) |
| | 6 Months | .08 | .03 | .08 | .81 |
| | 1 Year | .00 | .00 | .01 | .99 |
| | 2 Years | .06 | .03 | .03 | .88 |
| | 3 Years | .03 | .03 | .00 | .94 (35%) |

Tables 7.3 and 7.4 illustrate the flexibility of health lifestyles. For example, 100% of children in Status 1 at baseline (25% of the sample) did, in fact, belong to that status at baseline (by definition). Six months later, only 72% of the children remained in Status 1, while 21% transitioned to Status 3, the unhealthy but low-risk lifestyle. Ultimately only 65% of the children originally in Status 1 at baseline remained there at the three-year follow-up, although additional children shifted into that lifestyle over time, such that it still contained 21% of the sample at the end of the study. What is clear from Tables 7.3 and 7.4 is that membership in health lifestyles was much more stable for parents than it was for children (with the exception of Status 2 for parents). This trend can be seen because the probability of remaining in a particular status for children, regardless of the baseline status, ranged from .53 to .84. For parents, on the other hand (excluding Status 2), these numbers ranged from .81 to .98. Status 2 for parents was very unstable, perhaps due to the small number of parents in that status at baseline and the fact that education about the importance of birth control and condoms for sexually active teenagers could have shifted parents out of that status. This difference between children and parents is understandable, since preadolescents are in the midst of trying on new behaviors and lifestyles as they expand their autonomy and develop their identities, while parents are more settled.

**Question 5: Does a relationship exist between parents' and children's health lifestyles over time?**

Table 7.5 and Table 7.6 examine the relationship between parents' and children's health lifestyles over time. Table 7.5 describes the impact on children's health lifestyle status membership probabilities, while Table 7.6 focuses on parents' health lifestyle status

membership probabilities. For the reader's benefit the results of all of the random effects model regressions presented in Chapter 7 and Chapter 8 are also presented in an individual, comprehensive table for each status in the Appendix (see Tables A.11-14 for children and Tables A.15-18 for parents), as opposed to the way they are shown here (i.e. with a separate table for each analysis that contains all four statuses). Figures 7.1-4 illustrate the association between child health lifestyle status membership probabilities and parent baseline class.

**Table 7.5: Relationship Between Parents'[1] and Children's[2] Health Lifestyle Status Membership Probabilities, Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | **Child Status 1** | | **Child Status 2** | | **Child Status 3** | | **Child Status 4** | |
|---|---|---|---|---|---|---|---|---|
| | *Healthy and low-risk* | | *Unhealthy and high-risk* | | *Unhealthy and low-risk* | | *Healthy and high-risk* | |
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Intervention group[3] | | | | | | | | |
| Brief | -.02 | (.02) | .02 | (.02) | .01 | (.03) | -.01 | (.02) |
| Enhanced | .01 | (.02) | .00 | (.02) | .02 | (.03) | -.03 | (.02) |
| Site[4] | | | | | | | | |
| Atlanta | .05 | (.03) | .02 | (.02) | -.08** | (.03) | .02 | (.02) |
| Little Rock | -.03 | (.02) | .01 | (.02) | .01 | (.03) | .01 | (.02) |
| Parent status 2[5] | -.07* | (.03) | .09** | (.03) | -.01 | (.04) | .00 | (.03) |
| Parent status 3 | -.08** | (.02) | .08*** | (.02) | .00 | (.03) | .02 | (.02) |
| Parent status 4 | -.05* | (.02) | .05* | (.02) | .04 | (.02) | -.02 | (.02) |
| Constant | .31*** | (.03) | .13*** | (.02) | .41*** | (.03) | .15*** | (.02) |
| Observations | 3956 | | 3956 | | 3956 | | 3956 | |
| Groups | 1104 | | 1104 | | 1104 | | 1104 | |
| Log-likelihood | -820.42 | | -202.90 | | -1143.84 | | -287.45 | |
| Sigma_u | .29 | (.01) | .26 | (.01) | .33 | (.01) | .21 | (.01) |
| Sigma_e | .23 | (.00) | .20 | (.00) | .25 | (.00) | .21 | (.00) |
| Rho | .61 | (.01) | .65 | (.01) | .63 | (.01) | .48 | (.02) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[2] Children's health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex.

[3] The General Intervention is the reference category.
[4] Athens is the reference category.
[5] Parent status 1 is the reference category. Parent status 1 = Healthy, lower sexual risk, moderate stress. Parent status 2 = Somewhat healthy, high sexual risk, some stress. Parent status 3 = Unhealthy, some sexual risk, high stress. Parent status 4 = Unhealthy, lower sexual risk, low stress.

**Figure 7.1: Probability of Child Membership in Health Lifestyle Status 1 Over Time by Parent Latent Class at Baseline (Parents Matter! Data, 2001-2006)**

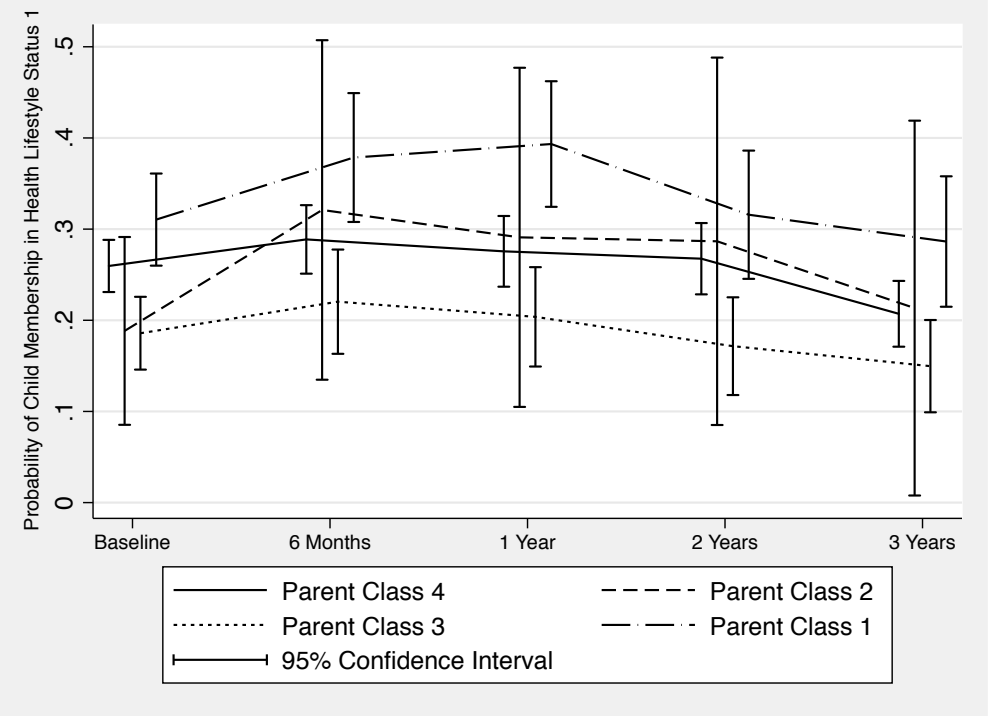



**Figure 7.2: Probability of Child Membership in Health Lifestyle Status 2 Over Time by Parent Latent Class at Baseline (Parents Matter! Data, 2001-2006)**

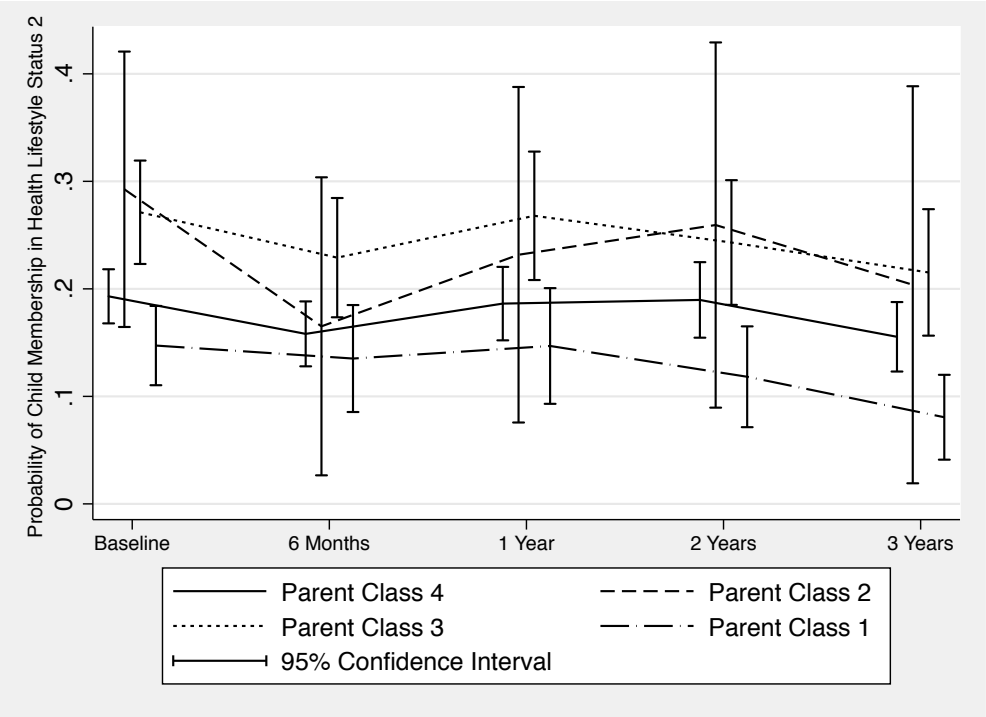


**Figure 7.3: Probability of Child Membership in Health Lifestyle Status 3 Over Time by Parent Latent Class at Baseline (Parents Matter! Data, 2001-2006)**

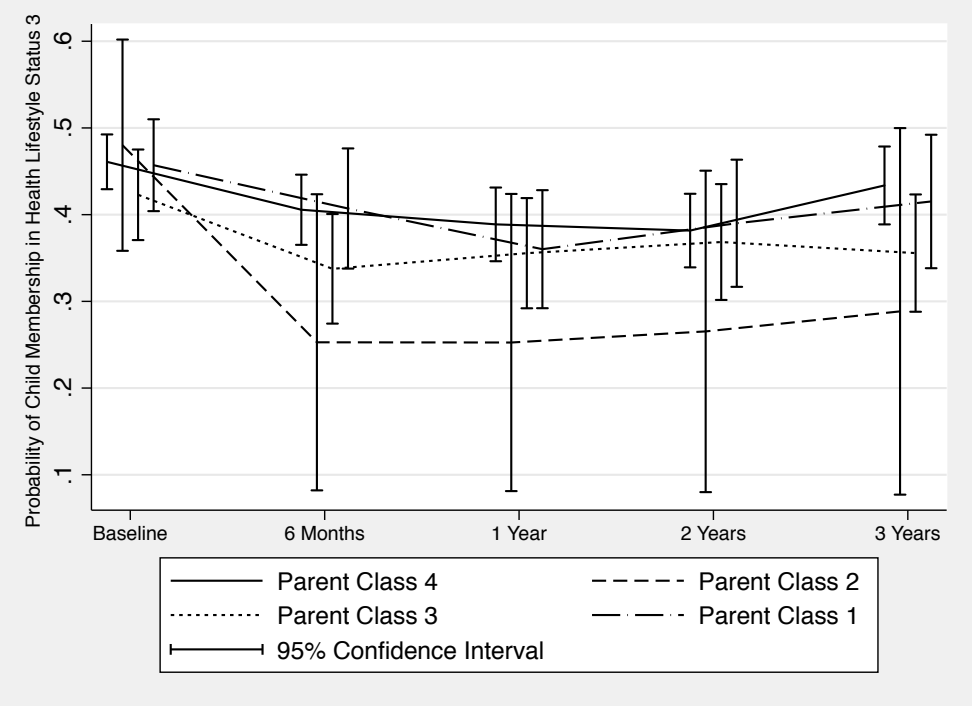
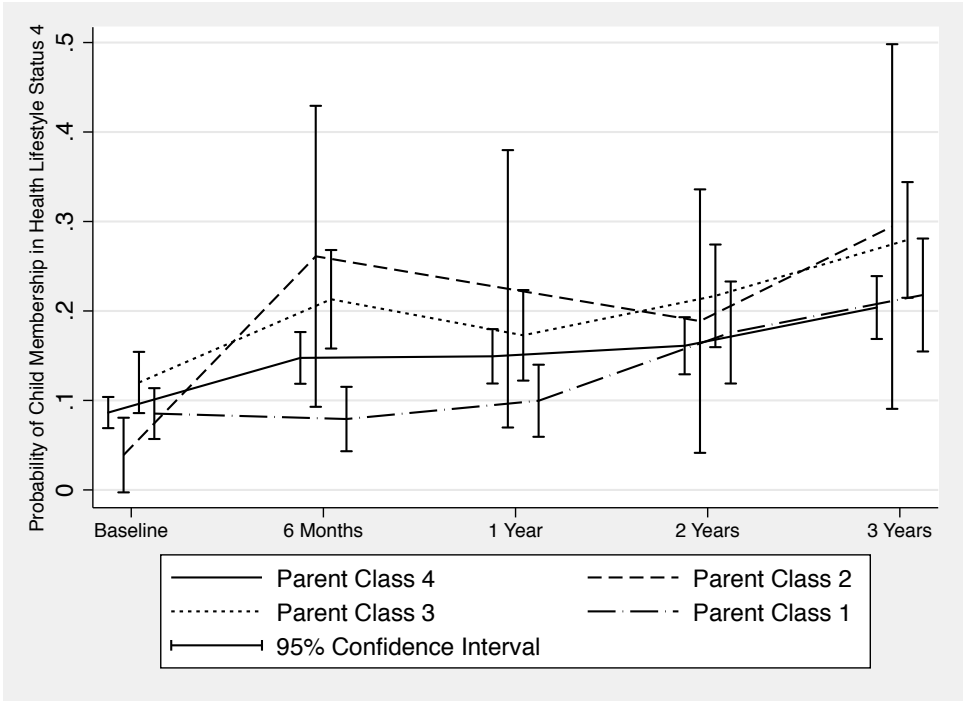



**Figure 7.4: Probability of Child Membership in Health Lifestyle Status 4 Over Time by Parent Latent Class at Baseline (Parents Matter! Data, 2001-2006)**



In the adjusted model presented in Table 7.7, parent status was associated with child membership in Status 1 and Status 2. Children whose parents were more likely to belong to a suboptimal health lifestyle (i.e. a status other than Status 1) were less likely to belong to the healthiest child lifestyle (Status 1) and more likely to belong to the least healthy child lifestyle (Status 2). For example, for every one-unit increase in parents belonging to a suboptimal lifestyle, children's probability of membership in Status 1 decreased by .05-.08.

The effect of parent baseline latent class on the probability of child status membership can be seen in Figures 7.1-4. Parents' best-fitting baseline latent class was markedly associated with the probability of child status membership, particularly for child Status 1 and Status 2, the binary/consistent health lifestyles. Children whose parents belonged to the healthiest lifestyle (Class 1) were themselves significantly more likely to belong to the healthiest status (Status 1) and less likely to belong to the unhealthiest status (Status 2) from baseline to the three-year follow-up. This provides evidence that parent health lifestyles are transmitted to children and influence preadolescents' health lifestyle development over time. The picture is less clear for child membership in Status 3 and Status 4, although children whose parents' best-fitting class was Class 3 (an unhealthy lifestyle with high stress and some sexual risk behaviors) had a significantly lower probability of membership in Status 4 (the healthy but high-risk lifestyle) at the 6-month follow-up. Taken together, Table 7.5 and Figures 7.1-4 illustrate that a parent's initial health lifestyle affects his or her child's health lifestyle development during preadolescence and early adolescence. Moreover, the parent's own lifestyle development also influences his or her child's health lifestyle development.

The following table (Table 7.6) examines parents' health lifestyle status membership probabilities:

**Table 7.6: Relationship Between Children's[1] and Parents'[2] Health Lifestyle Status Membership Probabilities, Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | **Parent Status 1** *Healthy, lower sexual risk, moderate stress* | | **Parent Status 2** *Somewhat healthy, high sexual risk, some stress* | | **Parent Status 3** *Unhealthy, some sexual risk, high stress* | | **Parent Status 4** *Unhealthy, lower sexual risk, low stress* | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Intervention group[3] | | | | | | | | |
| Brief | .03 | (.03) | .00 | (.01) | -.02 | (.03) | -.01 | (.03) |
| Enhanced | -.03 | (.03) | -.01 | (.01) | -.02 | (.03) | .06* | (.03) |
| Site[4] | | | | | | | | |
| Atlanta | .04 | (.03) | .01 | (.01) | -.04 | (.03) | -.02 | (.03) |
| Little Rock | .00 | (.03) | .01 | (.01) | .00 | (.03) | -.01 | (.03) |
| Child status 2[5] | -.07*** | (.02) | .02 | (.01) | .04* | (.02) | .00 | (.02) |
| Child status 3 | -.02* | (.01) | .00 | (.01) | .01 | (.01) | .01 | (.01) |
| Child status 4 | -.02 | (.02) | .01 | (.01) | .02 | (.02) | -.02 | (.02) |
| Constant | .29*** | (.03) | .02* | (.01) | .32*** | (.03) | .37*** | (.03) |
| Observations | 3956 | | 3956 | | 3956 | | 3965 | |
| Groups | 1104 | | 1104 | | 1104 | | 1104 | |
| Log-likelihood | 369.53 | | 1571.80 | | 387.89 | | 287.18 | |
| Sigma_u | .37 | (.01) | .10 | (.00) | .37 | (.01) | .37 | (.01) |
| Sigma_e | .14 | (.00) | .14 | (.00) | .14 | (.00) | .15 | (.00) |
| Rho | .86 | (.01) | .36 | (.02) | .87 | (.01) | .86 | (.01) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Children's health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex.

[2] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know

how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[3] The General Intervention is the reference category.

[4] Athens is the reference category.

[5] Child status 1 is the reference category. Child status 1 = Healthy and low-risk. Child status 2 = Unhealthy and high-risk. Child status 3 = Unhealthy and low-risk. Child status 4 = Healthy and high-risk.

Table 7.6 shows that child status membership was less influential for parents than parent status membership was for children. Parents whose children were more likely to belong to the unhealthiest lifestyle (Status 2) as compared to the healthiest lifestyle (Status 1) were more likely to belong to Status 3, while parents whose children belonged to Status 2 or Status 3 rather than Status 1 were less likely to belong to the healthiest parent status (Status 1). For example, for every one-unit increase in child Status 2 (the least healthy lifestyle) there was a .07 decrease in the probability of parent membership in Status 1 (the healthiest lifestyle). No significant relationship existed for parent Status 2 or Status 4.

**Question 6: What role do socioeconomic status (SES), parents, and peers and other social factors play in the intergenerational transmission of health lifestyles?**

Now that it is evident that a relationship between child and parent health lifestyles exists, the next question is how that lifestyle transmission occurs. The following two tables contain the results from regressions testing the association between a variety of social factors and child (Table 7.7) and parent (Table 7.8) health lifestyle status membership probabilities. Keep in mind that, as mentioned in Chapter 5, for both of these tables there was no Bonferroni correction, so results that were only significant at the $p \leq .05$ level and $p < .01$ level may not be as reliable as those that were significant at the $p < .000$ level.

**Table 7.7: Factors Influencing Children's Health Lifestyle Status[1] Membership Probabilities and the Intergenerational Transmission of Health Lifestyle Statuses, Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | **Child Status 1** | | **Child Status 2** | | **Child Status 3** | | **Child Status 4** | |
|---|---|---|---|---|---|---|---|---|
| | *Healthy and low-risk* | | *Unhealthy and high-risk* | | *Unhealthy and low-risk* | | *Healthy and high-risk* | |
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Intervention group[2] | | | | | | | | |
| Brief | -.01 | (.02) | .01 | (.02) | .02 | (.03) | -.02 | (.02) |
| Enhanced | .03 | (.02) | .00 | (.02) | .02 | (.03) | -.05* | (.02) |
| Site[3] | | | | | | | | |
| Atlanta | .04 | (.03) | .01 | (.02) | -.06 | (.03) | .00 | (.02) |
| Little Rock | -.03 | (.02) | .01 | (.02) | .01 | (.03) | .01 | (.02) |
| Parent status 2[4] | -.08* | (.03) | .07* | (.03) | .01 | (.04) | .01 | (.03) |
| Parent status 3 | -.07** | (.02) | .04 | (.02) | .00 | (.03) | .04* | (.02) |
| Parent status 4 | -.08** | (.02) | .05* | (.02) | .02 | (.03) | .01 | (.02) |
| Female[5] | .01 | (.02) | -.08*** | (.02) | .17*** | (.02) | -.11*** | (.02) |
| Child age | -.01 | (.01) | .00 | (.01) | -.01 | (.01) | .02** | (.01) |
| Grade[6] | -.01 | (.01) | -.01 | (.01) | .03*** | (.01) | -.01 | (.01) |
| Education[7] | | | | | | | | |
| High school diploma/GED | | | | | | | | |
| Some college | .00 | (.03) | .02 | (.02) | .04 | (.03) | -.06** | (.02) |
| AA/technical degree | .03 | (.03) | -.02 | (.03) | .07* | (.04) | -.07** | (.02) |
| College degree or | -.02 | (.04) | .00 | (.03) | .07 | (.04) | -.05 | (.03) |
| higher | -.03 | (.04) | .02 | (.03) | .05 | (.04) | -.03 | (.03) |
| Monthly family income[8] | | | | | | | | |
| $500-999 | .01 | (.02) | .00 | (.02) | -.01 | (.02) | -.01 | (.02) |
| $1000-1999 | .01 | (.02) | .00 | (.02) | -.01 | (.02) | .01 | (.02) |
| $2000+ | -.01 | (.02) | -.02 | (.02) | .02 | (.02) | .01 | (.02) |
| Employment[9] | | | | | | | | |
| Part-time | .00 | (.02) | .02 | (.02) | -.01 | (.02) | -.01 | (.02) |
| Full-time | .00 | (.02) | .00 | (.01) | .00 | (.02) | .00 | (.01) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Family structure[10] | | | | | | | | |
| Steady partner | .01 | (.02) | -.01 | (.01) | .01 | (.02) | -.01 | (.01) |
| Cohabiting | -.01 | (.02) | -.01 | (.02) | .02 | (.02) | .00 | (.02) |
| Married | -.01 | (.02) | .01 | (.02) | .02 | (.02) | -.02 | (.02) |
| Religious attendance[11] | | | | | | | | |
| Once or twice a month | | | | | | | | |
| Once a week or | .01 | (.02) | .02 | (.01) | -.02 | (.02) | -.01 | (.01) |
| more | .01 | (.02) | .01 | (.01) | -.01 | (.02) | -.01 | (.01) |
| Does well on schoolwork | .05*** | (.01) | -.03** | (.01) | -.02 | (.01) | -.01 | (.01) |
| Happy in the past month | .02* | (.01) | -.01 | (.01) | -.01 | (.01) | .00 | (.01) |
| Peers who have had sex[12] | | | | | | | | |
| Only a few | -.05*** | (.01) | .03** | (.01) | -.03* | (.01) | .05*** | (.01) |
| About half or more | -.03* | (.01) | .03* | (.01) | -.10*** | (.02) | .10*** | (.01) |
| Believes parent think s/he should wait to have sex | .06*** | (.01) | -.06*** | (.01) | .02 | (.02) | -.02 | (.01) |
| Parent believes no sex before marriage[13] | | | | | | | | |
| A little true | .02 | (.01) | .00 | (.01) | .00 | (.02) | -.02 | (.01) |
| Very true | .03 | (.02) | .00 | (.01) | -.02 | (.02) | -.01 | (.01) |
| Parent participating[14] | .03* | (.02) | -.01 | (.01) | -.07*** | (.02) | .04** | (.01) |
| Has teen "parent"[15] | .00 | (.02) | .03 | (.02) | -.02 | (.03) | -.01 | (.02) |
| Monitoring: C[16] | .04*** | (.01) | -.04*** | (.01) | .00 | (.01) | .00 | (.01) |
| Monitoring: P | .00 | (.01) | -.01 | (.01) | .03* | (.01) | -.03** | (.01) |
| Quality: C[17] | .06** | (.02) | -.07*** | (.02) | .01 | (.02) | .00 | (.02) |
| Quality: P | .01 | (.02) | -.03 | (.02) | .01 | (.03) | .01 | (.02) |
| Communication: C[18] | .05*** | (.01) | -.02 | (.01) | -.06*** | (.02) | .03* | (.01) |
| Communication: P | -.01 | (.02) | .01 | (.01) | .01 | (.02) | -.01 | (.01) |
| Responsiveness: C[19] | .02 | (.02) | -.03 | (.02) | -.02 | (.02) | .02 | (.02) |
| Responsiveness: P | -.02 | (.03) | -.02 | (.02) | -.02 | (.03) | .05* | (.02) |
| Constant | -.13 | (.12) | .79*** | (.10) | .41** | (.13) | -.03 | (.10) |
| Observations | 3477 | | 3477 | | 3477 | | 3477 | |
| Groups | 1001 | | 1001 | | 1001 | | 1001 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Log-likelihood | -621.76 | | -64.44 | | -958.25 | | -113.50 | |
| Sigma_u | .27 | (.01) | .24 | (.01) | .31 | (.01) | .19 | (.01) |
| Sigma_e | .23 | (.00) | .19 | (.00) | .25 | (.00) | .21 | (.00) |
| Rho | .58 | (.02) | .61 | (.02) | .60 | (.02) | .46 | (.02) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Children's health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex.

[2] The General Intervention is the reference category.

[3] Athens is the reference category.

[4] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events. Parent status 1 is the reference category. Parent status 1 = Healthy, lower sexual risk, moderate stress. Parent status 2 = Somewhat healthy, high sexual risk, some stress. Parent status 3 = Unhealthy, some sexual risk, high stress. Parent status 4 = Unhealthy, lower sexual risk, low stress.

[5] Male is the reference category.

[6] 4th grade is the reference category at baseline, and 5th grade is the indicator value.

[7] Less than a high school diploma or GED is the reference category.

[8] $0-499 is the reference category.

[9] Other employment status (e.g. student, unemployed) is the reference category.

[10] No steady partner is the reference category.

[11] Never or a few times a year is the reference category.

[12] None is the reference category.

[13] Not at all true is the reference category.

[14] "Parent" includes biological, adoptive, and step-parents.

[15] The parent or guardian participating in the program, not necessarily the child's biological parent, was a teen parent.

[16] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.

[17] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.

[18] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes

questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.

[19] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

Table 7.7 reveals that socioeconomic status (SES) was minimally associated with child membership in health lifestyles, with the exception of some association between parent education and the "mixed" health lifestyles (Status 3 and Status 4). For instance, children whose parents had a high school diploma instead of no diploma had a .06 lower probability of belonging to Status 4, the healthy but high-risk status.

On the other hand, perceived peer norms about sex were associated with every status. Children who believed their peers had had sex had a .03-.10 increased probability of membership in high-risk statuses (Status 2 and Status 4). Perceived parent norms about sex were only associated with Status 1 and Status 2 in the adjusted analysis. Children who believed their parents wanted them to wait to have sex had a probability of membership in Status 1, the healthiest lifestyle, that was .06 higher than the probability for children who did not share that belief. However, parents' actual beliefs about having sex before marriage were not significant for any status.

The type of relationship children had with their parents was significantly associated with children's health lifestyle status membership probabilities. For instance, children who had a parent participating in the intervention rather than a non-parent saw a .07 decreased likelihood of belonging to Status 3 (the unhealthy but low-risk lifestyle). Every parent-child relationship variable was significantly associated with the probability of child status membership, although not always for every status or from both the child's and the parent's perspectives. Three variables were especially significant: child perception of parental monitoring, child perception of the quality of the parent-child relationship, and child perception of parent-child communication. More perceived parental monitoring was associated with an increased likelihood of belonging to Status 1 (.04) and a decreased

likelihood of belonging to Status 2 (-.04). Children's perceived quality of the parent-child relationship followed a similar pattern, with increased quality significantly linked to membership in Status 1 (.06) and Status 2 (-.07). Greater parent-child communication was not significantly associated with membership in Status 2, but it did increase the likelihood of membership in Status 1 (.05) and Status 4 (.03) and decrease it in Status 3 (-.06).

Table 7.8 shows the influence of social factors on parents' health lifestyle status membership probabilities:

**Table 7.8: Factors Influencing Parents' Health Lifestyle Status[1] Membership Probabilities and the Intergenerational Transmission of Health Lifestyle Statuses, Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | **Parent Status 1** *Healthy, lower sexual risk, moderate stress* | | **Parent Status 2** *Somewhat healthy, high sexual risk, some stress* | | **Parent Status 3** *Unhealthy, some sexual risk, high stress* | | **Parent Status 4** *Unhealthy, lower sexual risk, low stress* | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Intervention group[2] | | | | | | | | |
| Brief | .03 | (.03) | .00 | (.01) | -.03 | (.03) | .00 | (.03) |
| Enhanced | -.05 | (.03) | -.01 | (.01) | -.02 | (.03) | .07* | (.03) |
| Site[3] | | | | | | | | |
| Atlanta | .03 | (.03) | .01 | (.01) | -.07* | (.03) | .03 | (.03) |
| Little Rock | -.03 | (.03) | .01 | (.01) | .02 | (.03) | .01 | (.03) |
| Child status 2[4] | -.07*** | (.02) | .02 | (.01) | .02 | (.02) | .02 | (.02) |
| Child status 3 | -.02 | (.01) | .01 | (.01) | .00 | (.01) | 01 | (.01) |
| Child status 4 | -.05** | (.02) | .01 | (.01) | .02 | (.02) | .01 | (.02) |
| Female[5] | -.07 | (.07) | .00 | (.03) | .13* | (.07) | -.07 | (.07) |
| Parent age | .00**[19] | (.00) | .00* | (.00) | -.01*** | (.00) | .00 | (.00) |
| Education[6] | | | | | | | | |
| High school diploma/GED | | | | | | | | |
| Some college | .02 | (.03) | -.01 | (.01) | -.10** | (.03) | .08* | (.03) |
| AA/technical degree | .05 | (.04) | .00 | (.01) | -.20*** | (.04) | .14*** | (.04) |
| College degree or | .11** | (.04) | .00 | (.02) | -.20*** | (.04) | .09* | (.04) |
| higher | .16** | (.05) | .00 | (.02) | -.23*** | (.04) | .08 | (.05) |
| Monthly family income[7] | | | | | | | | |
| $500-999 | -.01 | (.01) | -.01 | (.01) | .01 | (.01) | .00 | (.01) |
| $1000-1999 | .01 | (.01) | .00 | (.01) | -.02 | (.01) | .01 | (.01) |
| $2000+ | .01 | (.02) | .00 | (.01) | -.02 | (.02) | .00 | (.02) |
| Employment[8] | | | | | | | | |
| Part-time | -.02 | (.01) | .02 | (.01) | -.02 | (.01) | .02 | (.01) |
| Full-time | -.01 | (.01) | .00 | (.01) | -.03* | (.01) | .03* | (.01) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Family structure[9] | | | | | | | | |
| Steady partner | .00 | (.01) | .02 | (.01) | -.01 | (.01) | -.01 | (.01) |
| Cohabiting | -.03* | (.01) | .02 | (.01) | -.03 | (.01) | .02 | (.01) |
| Married | -.02 | (.02) | .02 | (.01) | -.01 | (.02) | .01 | (.02) |
| Age of sexual debut[10] | | | | | | | | |
| 13-15 | -.04 | (.05) | -.03 | (.02) | .00 | (.05) | .07 | (.06) |
| 16-17 | -.04 | (.06) | -.03 | (.02) | .00 | (.05) | .09 | (.06) |
| 18+ | -.01 | (.06) | -.02 | (.02) | .00 | (.06) | .04 | (.06) |
| Birth control first sex | .02 | (.03) | -.01 | (.01) | -.05 | (.03) | .04 | (.03) |
| Condom use first sex | .07* | (.03) | .00 | (.01) | -.06* | (.03) | -.02 | (.03) |
| Believes it's his/her job to teach child about sex | .01 | (.01) | -.05*** | (.01) | .01 | (.01) | .01 | (.01) |
| Religious attendance[11] | | | | | | | | |
| Once or twice a month | | | | | | | | |
| Once a week or more | -.02<br>-.01 | (.01)<br>(.01) | .00<br>.01 | (.01)<br>(.01) | .01<br>.00 | (.01)<br>(.01) | .00<br>.01 | (.01)<br>(.01) |
| Believes religion is very important | .03* | (.01) | -.01 | (.01) | -.02 | (.01) | .00 | (.01) |
| Child's parent[12] | .03*** | (.01) | .00 | (.01) | .00 | (.01) | -.03*** | (.01) |
| Was a teen parent | .06 | (.03) | .00 | (.01) | -.05 | (.03) | -.01 | (.03) |
| Monitoring: C[13, 14] | .00 | (.01) | .01 | (.00) | .00 | (.01) | .00 | (.01) |
| Monitoring: P[15] | .01 | (.01) | -.01 | (.01) | .00 | (.01) | .00 | (.01) |
| Quality: C[16] | -.02 | (.01) | .00 | (.01) | -.01 | (.01) | .03** | (.01) |
| Quality: P | .05** | (.02) | -.03* | (.01) | -.10*** | (.01) | .08*** | (.02) |
| Communication: C[17] | .01 | (.01) | .02[20] | (.01) | .00 | (.01) | -.02 | (.01) |
| Communication: P | .03* | (.01) | .00 | (.01) | -.02 | (.01) | -.02 | (.01) |
| Responsiveness: C[18] | -.01 | (.01) | .00 | (.01) | .00 | (.01) | .02 | (.01) |
| Responsiveness: P | .04* | (.02) | -.03 | (.01) | .00 | (.02) | .00 | (.02) |
| Constant | -.25* | (.13) | .16* | (.06) | 1.12*** | (.13) | .00 | (.13) |
| Observations | 3386 | | 3386 | | 3386 | | 3386 | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Groups | 972 | | 972 | | 972 | | 972 | |
| Log-likelihood | 363.78 | | 1345.69 | | 388.79 | | 250.53 | |
| Sigma_u | .36 | (.01) | .10 | (.00) | .34 | (.01) | .36 | (.01) |
| Sigma_e | .14 | (.00) | .14 | (.00) | .14 | (.00) | .15 | (.00) |
| Rho | .86 | (.01) | .34 | (.02) | .85 | (.01) | .86 | (.01) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[2] The General Intervention is the reference category.

[3] Athens is the reference category.

[4] Children's health lifestyles were determined by using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex. Child status 1 = Healthy and low-risk. Child status 2 = Unhealthy and high-risk. Child status 3 = Unhealthy and low-risk. Child status 4 = Healthy and high-risk. Child status 1 is the reference category.

[5] Male is the reference category.

[6] Less than a high school diploma or GED is the reference category.

[7] $0-499 is the reference category.

[8] Other employment status (e.g. student, unemployed) is the reference category.

[9] No steady partner is the reference category.

[10] Age 12 or younger is the reference category.

[11] Never or a few times a year is the reference category.

[12] "Parent" includes biological, adoptive, and step-parents.

[13] "C" stands for the parenting practice from the child's perspective.

[14] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.

[15] "P" stands for the parenting practice from the parent's perspective.

[16] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.

[17] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships

(dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.

[18] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

[19] Age is positively associated with membership in health lifestyle status 4, but the number is to small to be captured when rounding to the hundredth decimal place.

[20] Child perception of communication is close to significance at $p = .051$.

SES-related variables, particularly education, were far more important for parent status membership than they were for children. For instance, parents who had received a high school diploma or any additional education had much lower probabilities of belonging to Status 3 (an unhealthy status with high stress and some sexual risk behaviors). While receiving a high school diploma or GED reduced the probability of membership in Status 3 by .10 (a sizeable amount given the fact that probability only ranges from 0-1), parents who had received at least a college degree reduced their probability of membership in Status 3 by .23.

Parent values were also relevant for some statuses. Those parents who believed it is their job to teach their children about sex were significantly less likely to belong to Status 2 (-.05), while those who believed religion is important were more likely to belong to Status 1 (.03). Religious attendance, however, was not significant. Being the actual parent (biological, adoptive, or step) to a child in the intervention was associated with increased membership in Status 1 (.03) and decreased membership in Status 4 (-.03), perhaps suggesting that participants who were parents felt a need to serve as strong role models for their children in a way that non-parents may not have.

As for variables related to the parent-child relationship, only parent perception of the quality of the parent-child relationship was significantly associated with all statuses. Parents who perceived a better quality relationship with their children were more likely to belong to Status 1 (.05) and Status 4 (.08) and less likely to belong to Status 2 (-.03) and Status 3 (-.10). Parental monitoring, parent-child communication, and parental responsiveness from either perspective lost nearly all of the significance they had in the unadjusted model (see Table A.10 in the Appendix).

**Discussion**

Three conclusions can be drawn about the questions asked in this chapter. First, in regards to Question 4, there is evidence that preadolescents and adults changed their health lifestyles over time, even during the short three-year time span of the Parents Matter! study. However, child lifestyles were markedly less stable than parent lifestyles, which is to be expected given the expanding set of health behaviors and increased independence available to the preadolescents, who transitioned to being 12-15-year-olds over the course of the study.

Second, in answer to Question 5, a relationship between parents' and children's health lifestyles existed over time, in two ways. The best-fitting latent class at baseline was significantly associated with the development of child and parent health lifestyles. Additionally, parent and child status membership probabilities over time were associated with their dyad partner's status membership probabilities over time as well. These relationships show that a parent's initial health lifestyle shapes his or her child's lifestyle development, but shifts in the parent's lifestyle also have an effect on his or her child's lifestyle development. Thus, a parent's health lifestyle when his or her child is a preadolescent can shape the child's health lifestyle trajectory, and the parent's health lifestyle over time may continue to influence that trajectory, illustrating that parents who take the initiative to improve their own health lifestyles may improve the health lifestyles of their children as well.

Finally, the results for Question 6 indicate several potential mechanisms that may help explain the intergenerational transmission of health lifestyles. SES had little impact for children, but some aspects of SES, like education, were significantly associated with parent

lifestyles. Although family SES might have been expected to directly impact children (e.g. Wickrama et al. 1999), in this case SES only impacted children's health lifestyles indirectly through its impact on parents' health lifestyles. SES also appeared to shape parenting practices, since in the fully adjusted model for children (Table 7.7) parent perceptions of parenting practices lost almost all of the significance they had in the unadjusted analysis. However, this lack of a direct impact may change as children age, and certainly SES will affect children's health lifestyles as adults, as childhood SES often predicts adult SES and health.

Perceived norms were also important mechanisms shaping the development and transmission of health lifestyles. Children who believed their peers had begun having sex were more likely to engage in high-risk health lifestyles, but children who believed their parents thought they should wait until they were older to have sex were more likely to adopt the healthiest lifestyle (Status 1) and less likely to embrace the unhealthiest lifestyle (Status 2). This was true even though the strictness of parents' *actual* beliefs, operationalized by parents believing people should wait until marriage to have sex, was not significant. Taken together, these findings suggest that while peers may be inescapable influences on children's health lifestyles, parents can help counteract that influence with the norms they provide for their children. Of course, as children age the influence of peers grows, so for the parents of teenagers maintaining a strong relationship that can communicate parental norms is key.

Characteristics of the parent-child relationship also served as mechanisms for explaining the intergenerational transmission of health lifestyles. Surprisingly, child and parent perceptions of parental monitoring, relationship quality, parent-child

communication, and parental responsiveness were almost never significantly associated with child or parent status membership at the same time, with one exception: child and parent perceptions of relationship quality were both significantly associated with parent membership in Status 4. This suggests that even though children and parents reported relatively similar levels of parenting practices (see Table 6.1 in the previous chapter) the actual impact of that practice may depend more on who perceives it and on the particular lifestyle under consideration.

For example, in the adjusted model for children (Table 7.7) child perception of parental monitoring was only significantly associated with child membership for Status 1 and Status 2 (the two consistent or binary health lifestyles). Parent perception of parental monitoring, on the other hand, was only significantly associated with child membership in Status 3 and Status 4 (the mixed or bidimensional health lifestyles). Child perception of parental monitoring reflects the internalization of that monitoring, and as such it would correspond to a *habitus*-level shaping of children's lifestyles. Parent perception of parental monitoring, on the other hand, conveys the externalization of monitoring in everyday life (provided parents really do know what their children are doing). This corresponds with a bidimensional model of health lifestyles because it points to the role of family both before the *habitus* and after the *habitus* in the shape of risk and protective factors. Interestingly, parent perception of parental monitoring was significant for all four child statuses in the unadjusted analysis, but the impact of this externalization was erased when SES and other covariates were included in the model. Internalized perceptions of parental monitoring, on the other hand, were only ever associated with Status 1 and Status 2 for children.

Overall, these results continue to emphasize two trends established in the previous chapter: different health lifestyles are influenced by different factors and health lifestyles have a lasting effect on health over time. This chapter builds on the previous chapter by demonstrating that child and parent health lifestyles are related and it presents possible mechanisms for explaining the intergenerational transmission of those health lifestyles. In the final results chapter, Chapter 8, I will address how public health interventions can improve health behaviors, health lifestyles, and harness the intergenerational transmission of health lifestyles to improve the health of preadolescents and their parents.

# Chapter 8: Results—Intervening in Health Lifestyles

The previous two chapters laid the foundation for understanding the nature of health lifestyles for preadolescents and their parents by determining which behaviors "hang together" to form health lifestyles as well as how children's health lifestyles relate to their parents' health lifestyles. In Chapter 8, the focus turns to using that knowledge to assess how interventions can improve health behaviors, health lifestyles, and facilitate the intergenerational transmission of the most beneficial health lifestyles.

## Question 7: Do parent-based interventions impact the general and sexual health behaviors of children and their parents?

In order to examine the ability of the interventions to affect health behaviors, pairwise comparisons of the three intervention groups' mean values for a variety of behaviors were made at each follow-up time point. Children's health behaviors are included in Table 8.1, and parents' health behaviors are covered in Table 8.2. The table may be difficult to interpret at first, but for each behavior at each time point pairwise comparisons between the interventions of the mean values of the behaviors are presented. For instance, for "eats fruits and vegetables" at the six-month follow-up, the mean value of fruit and vegetable consumption for the Enhanced Intervention was .28 and the mean value for the General Intervention was .32. The first number below the mean values indicates the difference in values (which sometimes does not match up with the difference in the means listed above because of rounding error). In this case, the difference between the two interventions was .03. The second number is the Tukey's HSD test statistic, which in this

case was 3.54 and significant. Note that the Tukey's HSD output only identifies whether comparisons are significant at the $p \leq .05$ level. I have included all of the health lifestyle behaviors in order to see how effective interventions are at crossing the expected domains of influence (e.g. did the General Intervention influence sexual behaviors and did the Enhanced Intervention alter exercise behaviors?).

**Table 8.1: Pairwise Comparisons[1] of the Effect of Parent-Based Interventions on Children's General and Sexual Health Behaviors[2] from Six Months Post-Intervention to Three Years Post-Intervention (Parents Matter! Data, 2001-2006)**

| | **6 Months** (*N* = 732[3]) | **1 Year** (*N* = 715) | **2 Years** (*N* = 657) | **3 Years** (*N* = 594) |
|---|---|---|---|---|
| **Variables and Interventions** | $\mu_1, \mu_2$ $\Delta\mu$ (HSD) | $\mu_1, \mu_2$ $\Delta\mu$ (HSD[4]) | $\mu_1, \mu_2$ $\Delta\mu$ (HSD[4]) | $\mu_1, \mu_2$ $\Delta\mu$ (HSD[4]) |
| Eats fruits and vegetables daily | | | | |
| Enhanced vs. General | .28, .32 | .23, .30 | .24, .22 | .20, .23 |
| | .03 (3.54)* | .06 (5.42)* | .02 (2.08) | .03 (2.98) |
| Brief vs. General | .37, .32 | .29, .30 | .23, .22 | .22, .23 |
| | .06 (5.61)* | .01 (.53) | .00 (.32) | .01 (1.06) |
| Brief vs. Enhanced | .37, .28 | .29, .23 | .23, .24 | .22, .20 |
| | .09 (9.15)* | .06 (4.90)* | .02 (1.75) | .02 (1.92) |
| Consumes dairy products daily | | | | |
| Enhanced vs. General | .43, .41 | .38, .37 | .36, .43 | .36, .44 |
| | .03 (2.64) | .01 (1.17) | .07 (7.46)* | .08 (7.30)* |
| Brief vs. General | .42, .41 | .43, .37 | .34, .43 | .43, .44 |
| | .01 (1.37) | .06 (5.65)* | .09 (9.25)* | .01 (.83) |
| Brief vs. Enhanced | .42, .43 | .43, .38 | .34, .36 | .43, .36 |
| | .01 (1.27) | .05 (4.48)* | .02 (1.80) | .07 (6.47)* |
| Eats breakfast daily | | | | |
| Enhanced vs. General | .48, .50 | .48, .46 | .38, .38 | .32, .38 |
| | .02 (2.39) | .02 (2.71)* | .00 (.12) | .06 (5.23)* |
| Brief vs. General | .44, .50 | .42, .46 | .35, .38 | .31, .38 |
| | .06 (5.94)* | .04 (4.99)* | .03 (3.20) | .07 (6.32)* |
| Brief vs. Enhanced | .44, .48 | .42, .48 | .35, .38 | .31, .32 |
| | .03 (3.55)* | .06 (7.70)* | .03 (3.07) | .01 (1.09) |
| Gets physical activity daily | | | | |

| | | | | |
|---|---|---|---|---|
| Enhanced vs. General | .62, .65 | .58, .66 | .64, .70 | .63, .66 |
| | .03 (3.41)* | .08 (7.17)* | .05 (5.76)* | .03 (2.45) |
| Brief vs. General | .68, .65 | .67, .66 | .66, .70 | .61, .66 |
| | .03 (2.85) | .02 (1.47) | .04 (3.87)* | .05 (3.78)* |
| Brief vs. Enhanced | .68, .62 | .67, .58 | .66, .64 | .61, .63 |
| | .06 (6.25)* | .09 (8.65)* | .02 (1.90) | .02 (1.33) |
| Drinks alcohol[5] | | | | |
| Enhanced vs. General | .17, .19 | .21, .20 | .24, .29 | .34, .34 |
| | .02 (1.83) | .01 (.69) | .05 (3.85)* | .00 (.04) |
| Brief vs. General | .18, .19 | .20, .20 | .30, .29 | .37, .34 |
| | .01 (.66) | .00 (.03) | .00 (.31) | .03 (2.10) |
| Brief vs. Enhanced | .18, .17 | .20, .21 | .30, .24 | .37, .34 |
| | .01 (1.17) | .01 (.73) | .06 (4.16)* | .03 (2.06) |
| Uses tobacco[5] | | | | |
| Enhanced vs. General | .07, .07 | .06, .07 | .05, .11 | .08, .13 |
| | .01 (.76) | .01 (1.41) | .06 (7.56)* | .05 (7.58)* |
| Brief vs. General | .07, .07 | .05, .07 | .11, .11 | .07, .13 |
| | .00 (.20) | .02 (2.17) | .00 (.43) | .06 (8.78)* |
| Brief vs. Enhanced | .07, .07 | .05, .06 | .11, .05 | .07, .08 |
| | .01 (.96) | .01 (.76) | .06 (7.13)* | .01 (1.20) |
| Uses drugs[5] | | | | |
| Enhanced vs. General | .03, .04 | .03, .05 | .04, .10 | .10, .13 |
| | .01 (1.45) | .02 (3.16) | .05 (7.91)* | .03 (2.44) |
| Brief vs. General | .03, .04 | .02, .05 | .05, .10 | .14, .13 |
| | .01 (1.37) | .03 (4.30)* | .04 (6.49)* | .01 (1.17) |
| Brief vs. Enhanced | .03, .03 | .02, .03 | .05, .04 | .14, .10 |
| | .00 (.08) | .01 (1.14) | .01 (1.42) | .04 (3.61)* |
| Fights | | | | |
| Enhanced vs. General | .28, .25 | .25, .26 | .26, .28 | .16, .27 |
| | .02 (1.99) | .01 (.94) | .02 (2.01) | .11 (11.62)* |
| Brief vs. General | .31, .25 | .28, .26 | .30, .28 | .24, .27 |
| | .05 (4.49)* | .02 (2.04) | .02 (1.91) | .03 (3.13) |
| Brief vs. Enhanced | .31, .28 | .28, .25 | .30, .26 | .24, .16 |

| | | | | |
|---|---|---|---|---|
| | .03 (2.50) | .03 (2.98) | .04 (3.92)* | .08 (8.49)* |
| Gets into trouble with the police | | | | |
| Enhanced vs. General | .11, .13 | .11, .10 | .16, .17 | .15, .18 |
| | .02 (2.22) | .01 (1.20) | .00 (.34) | .03 (2.32) |
| Brief vs. General | .10, .13 | .12, .10 | .15, .17 | .19, .18 |
| | .03 (3.65)* | .01 (1.87) | .01 (1.32) | .01 (.64) |
| Brief vs. Enhanced | .10, .11 | .12, .11 | .15, .16 | .19, .15 |
| | .01 (1.43) | .01 (.67) | .01 (.98) | .04 (2.96) |
| Has willingly touched or been touched under clothing | | | | |
| Enhanced vs. General | .09, .11 | .08, .13 | .12, .20 | .28, .27 |
| | .02 (2.22) | .06 (6.74)* | .08 (6.82)* | .01 (.44) |
| Brief vs. General | .12, .11 | .12, .13 | .19, .20 | .29, .27 |
| | .00 (.47) | .01 (1.20) | .01 (1.17) | .01 (.80) |
| Brief vs. Enhanced | .12, .09 | .12, .08 | .19, .12 | .29, .28 |
| | .02 (2.69) | .05 (5.54)* | .07 (5.65)* | .01 (.36) |
| Believes s/he should wait until s/he is older to have sex | | | | |
| Enhanced vs. General | .75, .76 | .79, .72 | .65, .64 | .64, .69 |
| | .00 (.27) | .07 (3.69)* | .01 (.34) | .05 (2.17) |
| Brief vs. General | .77, .76 | .73, .73 | .65, .64 | .58, .69 |
| | .01 (.37) | .00 (.22) | .01 (.60) | .11 (4.66)* |
| Brief vs. Enhanced | .77, .75 | .73, .79 | .65, .65 | .58, .64 |
| | .01 (.64) | .06 (3.48)* | .01 (.26) | .06 (2.49) |
| Perceived likelihood of having sex in the next year[6] | | | | |
| Enhanced vs. General | .11, .10 | .10, .15 | .19, .26 | .30, .27 |
| | .01 (1.54) | .05 (4.40)* | .07 (4.44)* | .02 (1.43) |
| Brief vs. General | .10, .10 | .13, .15 | .23, .26 | .30, .27 |

| | | | | |
|---|---|---|---|---|
| | .01 (.61) | .02 (1.97) | .03 (2.23) | .03 (1.69) |
| Brief vs. Enhanced | .10, .11 | .13, .10 | .23, .19 | .30, .30 |
| | .01 (.93) | .03 (2.44) | .03 (2.22) | .00 (.26) |
| Has willingly touched boyfriend or girlfriend's "private parts" or willingly been touched there[7] | | | | |
| Enhanced vs. General | .05, .06 | .06, .06 | .10, .14 | .19, .19 |
| | .02 (3.35)* | .01 (1.04) | .04 (3.99)* | .01 (.42) |
| Brief vs. General | .05, .06 | .06, .06 | .10, .14 | .22, .19 |
| | .02 (3.25) | .01 (1.07) | .03 (3.26) | (.03, 2.35) |
| Brief vs. Enhanced | .05, .05 | .06, .06 | .10, .10 | .22, .19 |
| | .00 (.10) | .00 (.03) | .01 (.73) | .03 (1.93) |

** = $p \leq .05$* (no other significance value was available using Tukey's HSD).

[1] Pairwise comparisons were run using Tukey's Honestly Significant Difference (HSD) test after ANOVA.

[2] Behaviors are predictions of the probability of engaging in the behavior at a given time point. The estimates were arrived at after running a logistic regression adjusted for baseline latent class, intervention group, sex, age, grade, parent's education, monthly family income, parent's employment, family structure, religious attendance, doing well in school, happiness in the past month, number of peers having sex, child believing he/she should be older before having sex, parent believing people should not have sex before marriage, and intervention site. All covariates are time-varying except for baseline latent class, intervention group, sex, parent's education, and intervention site.

[3] *N* = 643 for drug use six months post-intervention.

[4] The studentized range critical value was approximately 3.3 for the majority of the comparisons.

[5] The original variable is dichotomized: 0 = never tried, 1 = tried once or used more than once.

[6] The original variable is dichotomized: 0 = less than an even chance of having sex next year, 1 = even chance or greater.

[7] "Private parts" is the phrase used in the assessment, and it was defined for respondents as "the parts of the body that are covered by underwear or a bra."

Several interesting trends about children's health behaviors emerge in Table 8.1. First, for nutrition and exercise behaviors, children from some interventions showed more improvement than others and these effects were noticeable at the three-year follow-up, demonstrating the lasting impact of the interventions. Although there was variation, overall children in the General Intervention reported more increases in these behaviors, while those in the Brief Intervention improved more than those in the Enhanced Intervention. For example, children whose parents were in the General Intervention were more likely at the three-year follow-up to eat breakfast daily (.38) than were children whose parents participated in the Brief (.31) or Enhanced (.32) Interventions. However, eating breakfast daily was an instance where children in the Enhanced Intervention actually improved more than those in the Brief Intervention at the six-month (.48 versus .44) and one-year (.48 versus .42) follow-ups.

Second, the Enhanced Intervention was clearly protective for substance use behaviors and fighting at often both the two-year and three-year follow-up points. To cite one example, only 8% of children in the Enhanced Intervention used tobacco at the three-year follow-up, versus 13% of children in the General Intervention. Third, while significant differences for substance use emerged at the two- and three-year follow-ups, differences in sexual behaviors were mainly limited to the one- and two-year follow-up time points. The Enhanced Intervention significantly outperformed the other two interventions at reducing the number of children engaged in sexual risk behaviors and increasing the number of children who believed they should wait until they were older to have sex. For instance, 26% of children in the General Intervention anticipated having sex within the next year at the two-year follow-up, compared to only 19% of children in the Enhanced Intervention.

The differential impact of the interventions on sexual behaviors and attitudes over time is easy to see in Figures 8.1-8.3:

**Figure 8.1: Probability of Child Touching or Being Touched Under Clothing by Intervention, Adjusted for All Child-Specific Covariates (Parents Matter! Data, 2001-2006)**

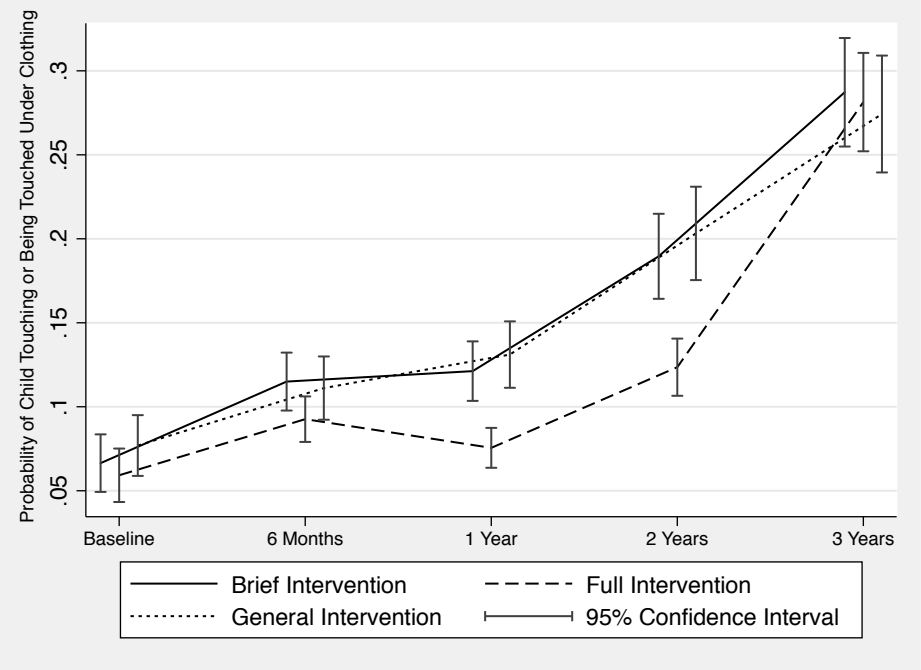


**Figure 8.2: Probability of Child Touching Another Child's "Private Parts" or Being Touched by Intervention, Adjusted for All Child-Specific Covariates (Parents Matter! Data, 2001-2006)**

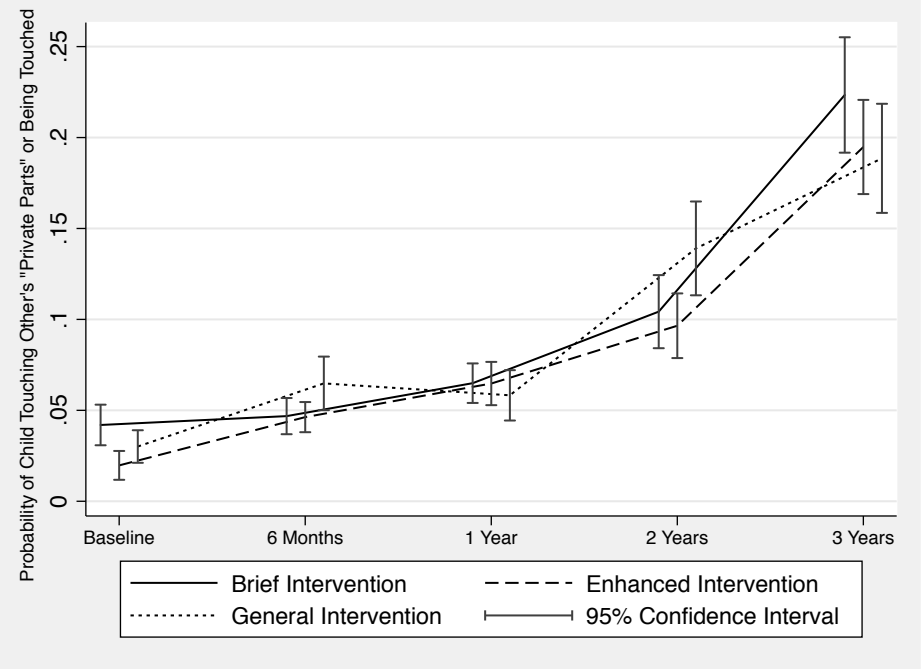
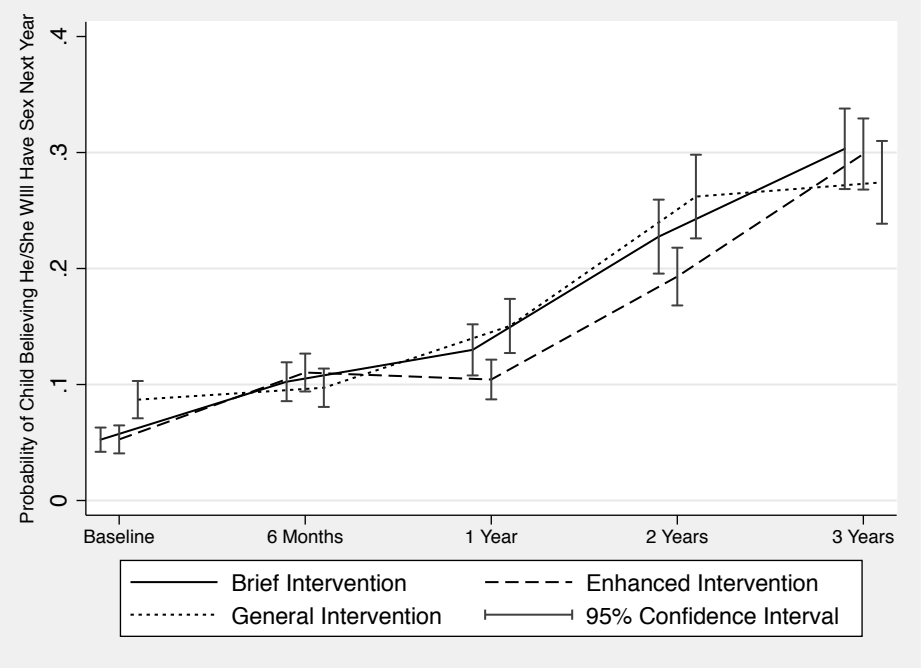



**Figure 8.3: Probability of Child Believing He/She Will Have Sex Within the Next Year by Intervention, Adjusted for All Child-Specific Covariates (Parents Matter! Data, 2001-2006)**



In Figure 8.1, the number of children touching or having been touched under clothing grew over time for all three intervention groups. However, belonging to the Enhanced Intervention significantly reduced the number of children touching or having been touched under clothing at the one-year and two-year follow-up points, although by the three-year follow-up the benefit of the intervention disappeared. In Figures 8.2 and 8.3, which examine whether children had touched "private parts" and their perceived odds of having sex within the next year, respectively, the differences between the interventions were not as pronounced. Still, the 95% confidence interval for the Enhanced Intervention was almost completely distinct from the confidence interval for the General Intervention at the two-year follow-up in Figure 8.2. The confidence intervals between the two were fully distinct at the one-year and two-year follow-up time points in Figure 8.3, showing that the Enhanced Intervention provided a clear benefit to preadolescents when compared to the General Intervention.

Table 8.2 and Figures 8.4-5 present the data on how the interventions affected parents' general and sexual health behaviors.

**Table 8.2: Pairwise Comparisons[1] of the Effect of Parent-Based Interventions on Parents' General and Sexual Health Behaviors[2] from Six Months Post-Intervention to Three Years Post-Intervention (Parents Matter! Data, 2001-2006)**

| | **6 Months** ($N$ = 715) | **1 Year** ($N$ = 695[3]) | **2 Years** ($N$ = 637[3]) | **3 Years** ($N$ = 577[3]) |
|---|---|---|---|---|
| **Variables and Interventions** | $\mu_1, \mu_2$<br>$\Delta\mu$ (HSD[4]) | $\mu_1, \mu_2$<br>$\Delta\mu$ (HSD[4]) | $\mu_1, \mu_2$<br>$\Delta\mu$ (HSD[4]) | $\mu_1, \mu_2$<br>$\Delta\mu$ (HSD[4]) |
| Eats at least five fruits and vegetables a day | | | | |
| Enhanced vs. General | .68, .64 | .60, .60 | .69, .65 | .70, .67 |
| | .03 (3.31) | .00 (.03) | .04 (4.59)* | .03 (2.67) |
| Brief vs. General | .64, .64 | .59, .60 | .68, .65 | .71, .67 |
| | .00 (.06) | .01 (1.24) | .03 (3.18) | .04 (3.82)* |
| Brief vs. Enhanced | .64, .68 | .59, .60 | .68, .69 | .71, .70 |
| | .04 (3.25) | .01 (1.21) | .01 (1.40) | .01 (1.15) |
| Reads nutrition labels | | | | |
| Enhanced vs. General | .24, .22 | .24, .24 | .28, .24 | .27, .28 |
| | .02 (1.48) | .00 (.29) | .03 (1.94) | .01 (.85) |
| Brief vs. General | .28, .22 | .28, .24 | .35, .24 | .34, .28 |
| | .06 (4.25)* | .04 (3.16) | .11 (6.54)* | .06 (3.63)* |
| Brief vs. Enhanced | .28, .24 | .28, .24 | .35, .28 | .34, .27 |
| | .04 (2.76) | .04 (3.45)* | .07 (4.61)* | .07 (4.47)* |
| Bakes, broils, or grills instead of frying | | | | |
| Enhanced vs. General | .28, .26 | .29, .30 | .32, .31 | .32, .32 |
| | .02 (1.62) | .02 (1.50) | .01 (1.15) | .00 (.38) |
| Brief vs. General | .33, .26 | .36, .30 | .33, .31 | .31, .32 |
| | .07 (7.38)* | .06 (5.32)* | .02 (2.11) | .01 (.74) |
| Brief vs. Enhanced | .33, .28 | .36, .29 | .33, .32 | .31, .32 |
| | .05 (5.75)* | .07 (6.82)* | .01 (.96) | .01 (1.12) |
| Exercises for at least 20 minutes a day three | | | | |

| | | | | |
|---|---|---|---|---|
| times a week | | | | |
| Enhanced vs. General | .15, .19 | .14, .23 | .17, .23 | .20, .22 |
| | .03 (3.68)* | .09 (10.32)* | .05 (5.04)* | .03 (2.42) |
| Brief vs. General | .16, .19 | .20, .23 | .22, .23 | .26, .22 |
| | .02 (2.69) | .04 (4.25)* | .01 (.54) | .04 (3.36)* |
| Brief vs. Enhanced | .16, .14 | .20, .14 | .22, .17 | .26, .20 |
| | .01 (.99) | .05 (6.07)* | .05 (4.50)* | .06 (5.79)* |
| Multiple sexual partners in the past six months[5] | | | | |
| Enhanced vs. General | .09, .10 | .10, .11 | .04, .06 | .01, .07 |
| | .01 (1.86) | .02 (1.92) | .02 (2.18) | .06 (8.13)* |
| Brief vs. General | .11, .10 | .10, .11 | .04, .06 | .03, .07 |
| | .00 (.64) | .01 (1.80) | .01 (1.81) | .04 (5.67)* |
| Brief vs. Enhanced | .11, .09 | .10, .10 | .04, .04 | .03, .01 |
| | .02 (2.50) | .00 (.12) | .00 (.38) | .02 (2.46) |
| High-risk birth control use[6] | | | | |
| Enhanced vs. General | .46, .43 | .46, .42 | .45, .49 | .47, .46 |
| | .03 (2.51) | .04 (3.81)* | .04 (2.80) | .01 (.42) |
| Brief vs. General | .44, .43 | .42, .42 | .44, .49 | .42, .46 |
| | .01 (1.05) | .00 (.38) | .05 (3.99)* | .04 (3.45)* |
| Brief vs. Enhanced | .44, .46 | .42, .46 | .44, .45 | .42, .47 |
| | .02 (1.45) | .04 (4.19)* | .01 (1.19) | .05 (3.87)* |
| Believes teens should know how to use birth control before having sex | | | | |
| Enhanced vs. General | .96, .95 | .97, .94 | .96, .95 | .96, .93 |
| | .02 (4.23)* | .03 (8.26)* | .01 (1.45) | .03 (5.29)* |
| Brief vs. General | .96, .95 | .97, .94 | .97, .95 | .94, .93 |
| | .01 (2.16) | .04 (9.31)* | .01 (2.66) | .01 (1.67) |
| Brief vs. Enhanced | .96, .96 | .97, .97 | .97, .96 | .94, .96 |
| | .01 (2.07) | .00 (1.06) | .01 (1.21) | .02 (3.63)* |

| | | | | |
|---|---|---|---|---|
| Believes teens should know how to use condoms before having sex | | | | |
| Enhanced vs. General | .99, .95 | .97, .96 | .96, .97 | .95, .94 |
| | .03 (7.78)* | .01 (1.84) | .01 (1.73) | .01 (2.07) |
| Brief vs. General | .96, .95 | .97, .96 | .97, .97 | .94, .94 |
| | .01 (2.60) | .01 (2.36) | .01 (1.52) | .00 (.48) |
| Brief vs. Enhanced | .96, .99 | .97, .97 | .97, .96 | .94, .95 |
| | .02 (5.18)* | .00 (.52) | .00 (.21) | .01 (1.59) |
| Feels nervous/stressed | | | | |
| Enhanced vs. General | .21, .24 | .23, .18 | .25, .27 | .21, .21 |
| | .03 (3.19) | .06 (5.07)* | .02 (1.26) | .00 (.16) |
| Brief vs. General | .18, .24 | .23, .18 | .27, .27 | .19, .21 |
| | .06 (5.57)* | .05 (4.73)* | .00 (.33) | .02 (1.93) |
| Brief vs. Enhanced | .18, .21 | .23, .23 | .27, .25 | .19, .21 |
| | .02 (2.39) | .00 (.33) | .01 (.92) | .02 (2.09) |
| Feels able to handle life events | | | | |
| Enhanced vs. General | .60, .62 | .63, .56 | .57, .64 | .59, .59 |
| | .02 (1.28) | .07 (5.43)* | .06 (4.51)* | .00 (.06) |
| Brief vs. General | .60, .62 | .61, .56 | .62, .64 | .61, .59 |
| | .02 (1.33) | .05 (4.03)* | .02 (1.63) | .02 (1.51) |
| Brief vs. Enhanced | .60, .60 | .62, .63 | .62, .57 | .61, .59 |
| | .00 (.05) | .02 (1.40) | .04 (2.88) | .02 (1.44) |

** = $p \leq .05$* (no other significance value was available using Tukey's HSD).

[1] Pairwise comparisons were run using Tukey's Honestly Significant Difference (HSD) test after ANOVA.

[2] Behaviors are predictions of the probability of engaging in the behavior at a given time point. The estimates were arrived at after running a logistic regression adjusted for baseline latent class, intervention group, sex, age, education, monthly family income, employment, family structure, age at first sex, birth control use at first sex, condom use at first sex, whether parent believes it is his/her job to teach child about sex, religious attendance, religious importance, and intervention site. All covariates are time-varying except for baseline latent class, intervention group, sex, education, age at first sex, birth control use at first sex, condom use at first sex, and intervention site.

[3] *N* = 672 for stress at 1 year, 616 for stress at 2 years, 560 for number of partners at 2 years, 373 for number of partners at 3 years, and 459 for teens should know how to use birth control and condoms at 3 years.
[4] The studentized range critical value was approximately 3.3 for the majority of the comparisons.
[5] The original variable is dichotomized: 0 = 0-1 partners, 1 = 2 or more partners.
[6] High-risk birth control use refers to individuals who are not using birth control (individuals who are trying to get pregnant and women aged 50 or older are coded as low-risk, due to menopause). There were insufficient cases to assess high-risk condom use as well.

**Figure 8.4: Probability of Parent Using Birth Control at Last Sex by Intervention, Adjusted for All Parent-Specific Covariates (Parents Matter! Data, 2001-2006)**

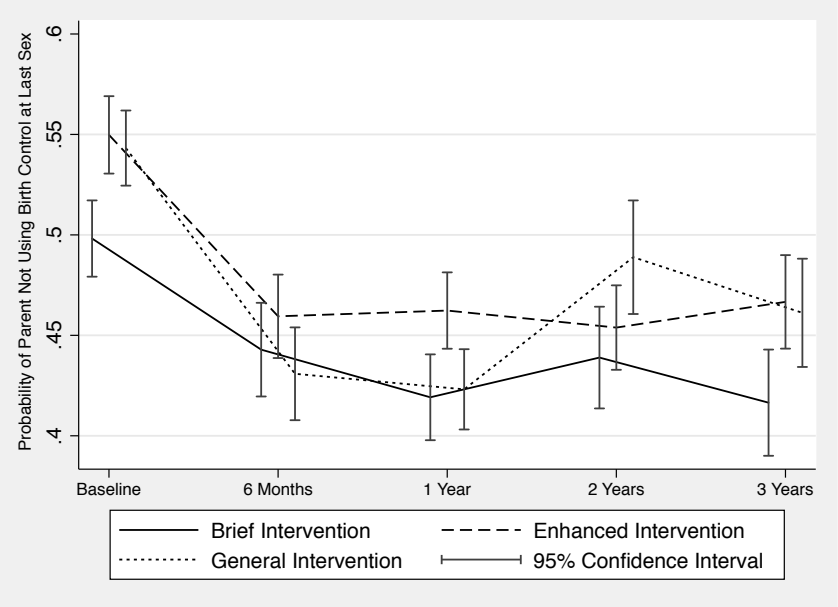
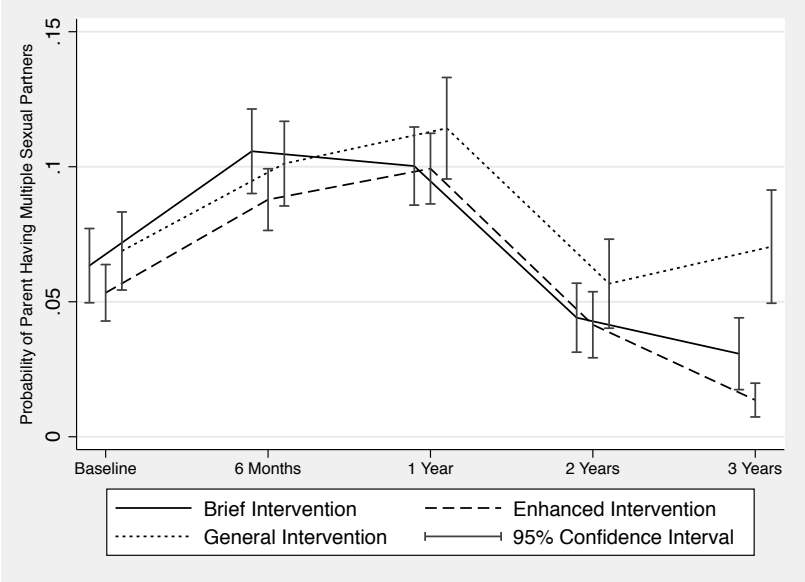



**Figure 8.5: Probability of Parent Having Multiple Sexual Partners by Intervention, Adjusted for All Parent-Specific Covariates (Parents Matter! Data, 2001-2006)**




The pairwise comparisons for parents in Table 8.2 show that parents in the Brief Intervention fared better than their peers in regard to nutrition behaviors (e.g. 36% of

parents in the Brief intervention baked, broiled, or grilled instead of frying at the one-year follow-up versus only 29% of parents in the Enhanced Intervention), while those in the General Intervention got the most exercise (e.g. 23% of parents in the General Intervention exercised at the one-year follow-up compared to 14% of parents in the Enhanced Intervention). The rate of "high-risk" birth control use was relatively high for parents in the Enhanced Intervention at the one-year follow-up (.46), and significantly fewer members of the Brief Intervention (.42) and General Intervention (.42) engaged in that behavior, but the overall pattern of declining "high-risk" birth control use was similar for all three interventions (see Figure 8.4).

For the remainder of the sexual variables, however, the Enhanced Intervention significantly outperformed the Brief and General Interventions. To cite one example, only 1% of the parents in the Enhanced Intervention had multiple sexual partners at the three-year follow-up, as compared to 3% of parents in the Brief Intervention and 7% in the General Intervention. Even after adjusting for all parent-specific covariates, the differences between the General Intervention and other interventions regarding having multiple sexual partners were significant at the three-year follow-up, and the difference between the Brief Intervention and the Enhanced Intervention was almost significant (see Figure 8.5), showing the lasting benefit of the Enhanced and Brief Interventions for sexual behaviors. The Enhanced Intervention also demonstrated an enduring ability to increase parent beliefs that teenagers should know how to use condoms before having sex (effective at the six-month follow-up) and birth control (effective through the three-year follow-up) when compared to both the Brief Intervention and the General Intervention. For example, at the six-month follow-up 99% of parents in the Enhanced Intervention agreed that teens should know how

to use condoms before having sex, compared to 96% of parents in the Brief Intervention and 95% of parents in the General Intervention. The trends for the stress variables were inconsistent.

**Question 8: Do parent-based interventions alter the health lifestyles of children and their parents?**

A similar method to the one seen in Tables 8.1-2 is also used in the following tables (8.3-4) to assess the impact of the interventions on health lifestyles. One key distinction is that Tables 8.3-4 are measuring change in the probability of status membership from baseline to a given time point rather than the absolute probability of status membership at that time point. See the discussion in Question 8 of the methods chapter (Chapter 5) for an extended defense of this approach. These tables should be read in the same manner as the previous tables, except in this case negative numbers are possible. Negative values indicate a reduction in the probability of membership in a particular health lifestyle status, while positive values indicate an increase in the probability of membership.

Graphs following each table (Figures 8.6-9 for children and Figures 8.10-13 for parents) provide an alternative perspective for evaluating the ability of the interventions to alter health lifestyles. These graphs show the absolute probability of status membership over time, stratified by intervention type. Confidence interval bars were not included in these graphs because there were no significant differences and the graphs were unnecessarily complicated to read when the bars were included. Although the graphs do

not depict significant differences, they nonetheless offer a glimpse into trends in health lifestyle status membership by intervention type.

**Table 8.3: Pairwise Comparisons[1] of the Effect of Parent-Based Interventions on Changes in Child Health Lifestyle Status[2] Membership Probabilities from Six Months Post-Intervention to Three Years Post-Intervention As Compared to Baseline Status (Parents Matter! Data, 2001-2006)**

| | **6 Months** (*N* =767) | **1 Year** (*N* = 747) | **2 Years** (*N* = 694) | **3 Years** (*N* = 644) |
|---|---|---|---|---|
| **Statuses and Interventions** | $\mu_1, \mu_2$ $\Delta\mu$ (HSD[3]) | $\mu_1, \mu_2$ $\Delta\mu$ (HSD[3]) | $\mu_1, \mu_2$ $\Delta\mu$ (HSD[3]) | $\mu_1, \mu_2$ $\Delta\mu$ (HSD[3]) |
| **Status 1** | | | | |
| *Healthy and low-risk* | | | | |
| Enhanced vs. General | .07, -.01 | .07, -.01 | .06, -0.01 | -.02, .03 |
| | .07 (3.87)* | .08 (3.45)* | .08 (3.02) | .02 (.66) |
| Brief vs. General | .03, -.01 | .05, -.01 | -.03, -.01 | -.06, -.03 |
| | (.04, 2.20) | .05 (2.52) | .02 (.75) | .03 (1.06) |
| Brief vs. Enhanced | .03, .07 | .05, .07 | -.04, .06 | -.06, -.02 |
| | .03 (1.67) | .02 (.94) | .09 (3.77)* | .05 (1.72) |
| **Status 2** | | | | |
| *Unhealthy and high-risk* | | | | |
| Enhanced vs. General | -.04, -.02 | -.02, .00 | -.03, .01 | -.04, -.03 |
| | .03 (1.47) | .02 (1.22) | .04 (1.70) | .02 (.68) |
| Brief vs. General | -.05, .02 | -.01, .00 | -.04, .01 | -.08, -.03 |
| | .03 (1.87) | .02 (.84) | .05 (2.34) | .05 (2.15) |
| Brief vs. Enhanced | -.05, -.04 | -.01, -.02 | -.04, -.03 | -.07, -.04 |
| | .01 (.40) | .01 (.38) | .01 (.64) | .03 (1.48) |
| **Status 3** | | | | |
| *Unhealthy and low-risk* | | | | |
| Enhanced vs. General | -.09, .02 | -.10, -.05 | -.11, -.067 | -.08, -.06 |
| | .07 (3.43)* | .04 (2.05) | .04 (1.60) | .02 (.63) |
| Brief vs. General | -.07, -.02 | -.09, -.05 | -.02, -.07 | -.02, -.06 |
| | .04 (1.96) | .04 (1.92) | .05 (1.81) | .04 (1.38) |
| Brief vs. Enhanced | -.06, -.09 | -.09, -.10 | -.02, -.11 | -.02, -.08 |
| | .03 (1.47) | .00 (.13) | .09 (3.41)* | .06 (2.01) |

| | | | | |
|---|---|---|---|---|
| **Status 4** | | | | |
| *Healthy and high-risk* | | | | |
| Enhanced vs. General | .07, .05 | .05, .06 | .08, .08 | .14, .12 |
| | .02 (.87) | .00 (.37) | .00 (.12) | .02 (.65) |
| Brief vs. General | .08, .05 | .06, .06 | .10, .08 | .16, .12 |
| | .03 (1.44) | .00 (.16) | .02 (.90) | .04 (1.53) |
| Brief vs. Enhanced | .08, .07 | .06, .05 | .10, .08 | .16, .14 |
| | .01 (.58) | .01 (.53) | .02 (.77) | .02 (.88) |

** = $p \leq .05$* (no other significance value was available using Tukey's HSD).

[1] Pairwise comparisons were run using Tukey's Honestly Significant Difference (HSD) test after ANOVA.

[2] Health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex.

[3] The studentized range critical value was approximately 3.3 for the majority of the comparisons.

While the intervention assignment was significantly associated with individual health behaviors for children and parents (Tables 8.1 and 8.2), they were less effective at altering entire health lifestyles. For children (Table 8.3), no intervention had an impact that lasted through the three-year follow-up. However, children in the Enhanced Intervention significantly increased their probability of membership in Status 1, the healthy and low-risk lifestyle, at the six-month (.07) and one-year (.07) follow-up, as compared to children in the General Intervention (-.01 for both time points). At the two-year follow-up Enhanced Intervention participants were also more likely (.06) than those in the Brief Intervention (-.04) to belong to Status 1. Children in the Enhanced Intervention were less likely to belong to Status 3, the unhealthy and low-risk category, compared to their peers at the six-month follow-up and two-year follow-up. For example, at the six-month follow-up children in the Enhanced Intervention had a .09 decrease in their probability of membership in Status 3, while children in the General Intervention had a .02 increase in probability. At the two-year follow-up the probability of membership in Status 3 decreased by .11 for children in the Enhanced Intervention and by .02 for children in the Brief Intervention. No significant differences existed for Status 2 or Status 4, the high-risk categories. These findings suggest that, more so than for other children, children in the Enhanced Intervention maintained low-risk lifestyles over time and adopted health-promoting behaviors as well (or at least the level of participation in these behaviors did not diminish as quickly as it did for the other groups given the general downward trend for all preadolescents).

Figures 8.6-9 present a slightly different perspective on the impact of the interventions on children's health lifestyles:

**Figure 8.6: Probability of Child Membership in Health Lifestyle Status 1 by Intervention (Parents Matter! Data, 2001-2006)**

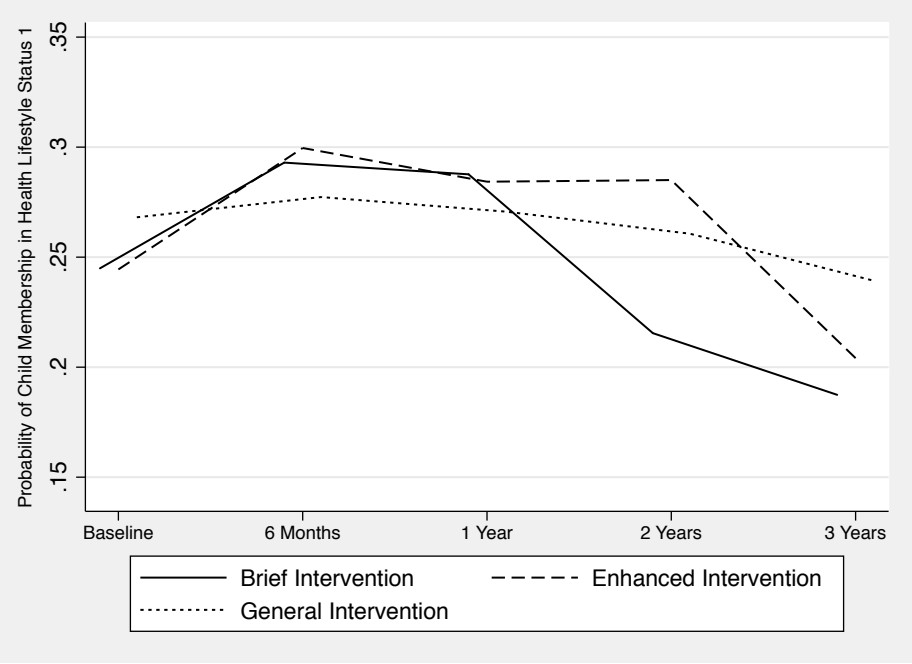



**Figure 8.7: Probability of Child Membership in Health Lifestyle Status 2 by Intervention (Parents Matter! Data, 2001-2006)**

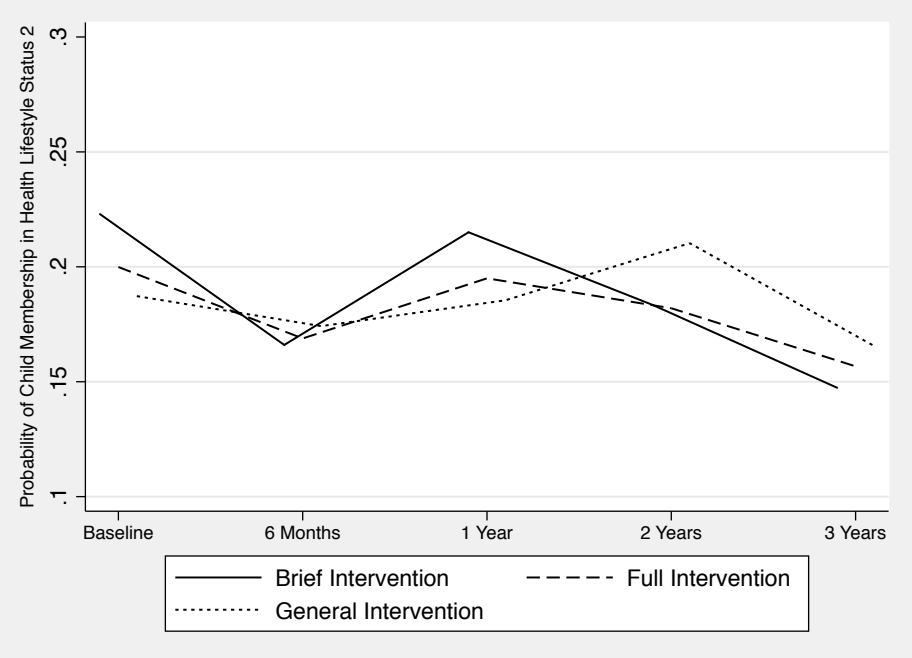


**Figure 8.8: Probability of Child Membership in Health Lifestyle Status 3 by Intervention (Parents Matter! Data, 2001-2006)**

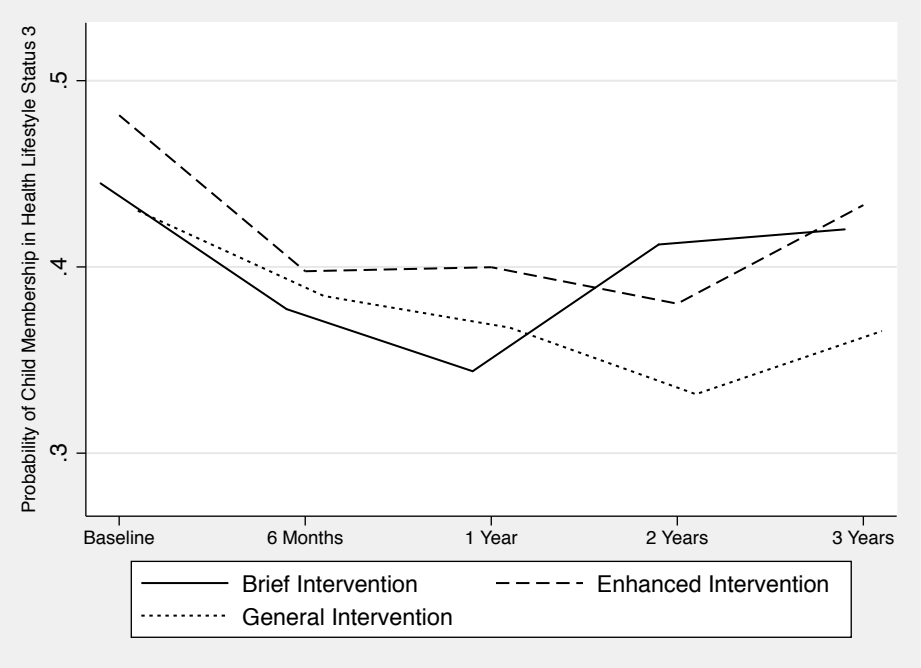



**Figure 8.9: Probability of Child Membership in Health Lifestyle Status 4 by Intervention (Parents Matter! Data, 2001-2006)**

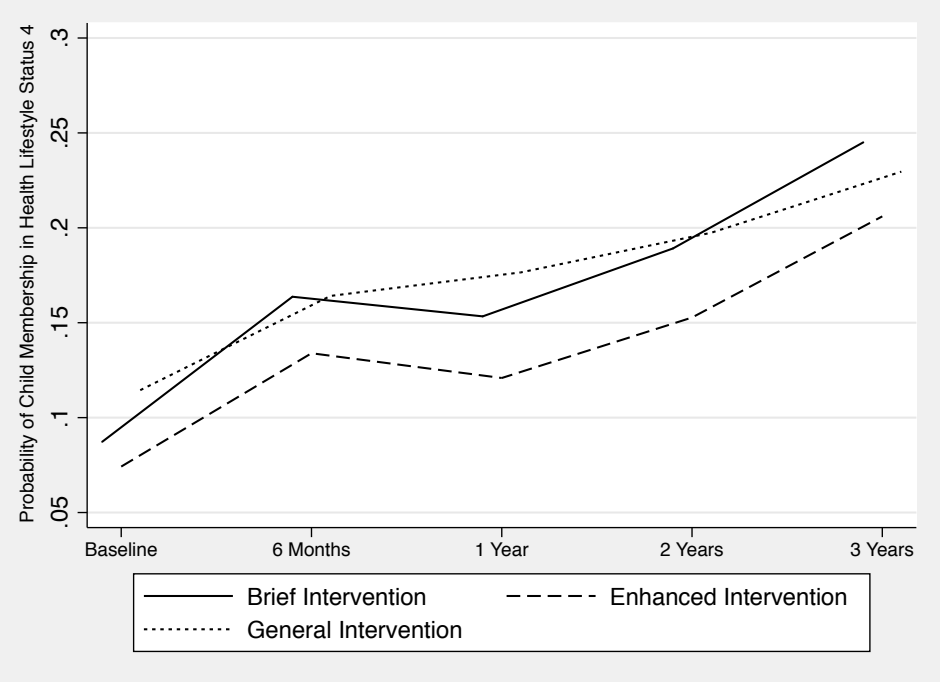


Figure 8.6 shows that, although children in all three interventions began with approximately the same likelihood of membership in Status 1, by the two-year follow-up children in the Enhanced Intervention and General Intervention had a higher probability of belonging to that status, although the effect for the Enhanced Intervention disappeared by the three-year follow-up. Few differences were seen between the interventions for Status 2 (Figure 8.7), although there was some evidence that children in the General Intervention had a higher likelihood of membership in Status 2 at the two-year follow-up, a finding replicated at the two- and three-year follow-up for Status 3 (Figure 8.8). The most interesting result was seen for Status 4, the unhealthy but high-risk status (Table 8.9). Children in the Enhanced Intervention had a lower probability of belonging to that health lifestyle across the time points, although the probability for all children increased over time.

Table 8.4 presents the pairwise comparisons of the efficacy of the interventions on parents' health lifestyles:

**Table 8.4: Pairwise Comparisons[1] of the Effect of Parent-Based Interventions on Changes in Parent Health Lifestyle Status[2] Membership Probabilities from Six Months Post-Intervention to Three Years Post-Intervention As Compared to Baseline Status (Parents Matter! Data, 2001-2006)**

| | **6 Months** (*N* =767) | **1 Year** (*N* = 747) | **2 Years** (*N* = 694) | **3 Years** (*N* = 644) |
|---|---|---|---|---|
| **Statuses and Interventions** | $\mu_1, \mu_2$ $\Delta\mu$ (HSD[3]) | $\mu_1, \mu_2$ $\Delta\mu$ (HSD[3]) | $\mu_1, \mu_2$ $\Delta\mu$ (HSD[3]) | $\mu_1, \mu_2$ $\Delta\mu$ (HSD[3]) |
| **Status 1** | | | | |
| *Healthy, lower sexual risk, moderate stress* | | | | |
| Enhanced vs. General | .06, .05 | .04, .04 | .07, .06 | .09, .09 |
| | .01 (.50) | .00 (.20) | .01 (.56) | .00 (.18) |
| Brief vs. General | .04, .05 | .03, .04 | .05, .06 | .07, .09 |
| | .01 (1.18) | .02 (1.23) | .02 (.91) | .02 (1.19) |
| Brief vs. Enhanced | .04, .06 | .03, .04 | .05, .07 | .07, .09 |
| | .02 (1.67) | .01 (1.03) | .03 (1.47) | .03, (1.37) |
| **Status 2** | | | | |
| *Somewhat healthy, high sexual risk, some stress* | | | | |
| Enhanced vs. General | -.01, .05 | -.02, .03 | .01, .04 | .00, .04 |
| | .06 (4.47)* | .05 (4.44)* | .03 (2.15) | .04 (2.71) |
| Brief vs. General | .00, .05 | -.02, .03 | .01, .04 | .00, .04 |
| | .05 (3.75)* | .05 (4.36)* | .03 (1.92) | .04 (2.70) |
| Brief vs. Enhanced | .00, -.01 | -.02, -.02 | .01, .01 | .00, .00 |
| | .01 (.72) | .00 (.09) | .00 (.23) | .00 (.01) |
| **Status 3** | | | | |
| *Unhealthy, some sexual risk, high stress* | | | | |
| Enhanced vs. General | -.01, -.04 | .01, -.03 | -.02, -.08 | -.01, -.08 |
| | .03 (2.50) | .04 (2.80) | .06 (3.22) | .06 (3.31) |
| Brief vs. General | -.01, -.04 | .01, -.03 | -.02, -.08 | -.01, -.08 |

| | | | | |
|---|---|---|---|---|
| | .03 (2.29) | .04 (2.85) | .06 (3.25) | .06 (3.34)* |
| Brief vs. Enhanced | -.01, -.01 | .01, .01 | -.02, -.02 | -.01, -.01 |
| | .00 (.21) | .00 (.04) | .00 (.03) | .00 (.03) |
| **Status 4** | | | | |
| *Unhealthy, low sexual risk, low stress* | | | | |
| Enhanced vs. General | -.04, -.06 | -.03, -.04 | -.06, -.03 | -.08, -.05 |
| | .02 (1.37) | .01 (1.04) | .03 (1.84) | .03 (1.27) |
| Brief vs. General | -.02, -.06 | -.02, -.04 | -.04, -.03 | -.05, -.05 |
| | .02 (2.49) | .03 (1.94) | .01 (.62) | .00 (.07) |
| Brief vs. Enhanced | -.02, -.04 | -.02, -.03 | -.04, -.06 | -.05, -.08 |
| | .01 (1.11) | .01 (.90) | .02 (1.23) | .03 (1.35) |

* = $p \leq .05$ (no other significance value was available using Tukey's HSD).

[1] Pairwise comparisons were run using Tukey's Honestly Significant Difference (HSD) test after ANOVA.

[2] Health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[3] The studentized range critical value was approximately 3.3 for the majority of the comparisons.

For parents (Table 8.4), the interventions significantly impacted membership probabilities for Status 2 and Status 3. Parents in the General Intervention were more likely to belong to Status 2 (the intervention marked by not believing teenagers should know how to use birth control and condoms before having sex) at the six-month (.05) and one-year (.03) follow-up than were parents in the other interventions (i.e. the mean values were -.01 and -.02 for the Enhanced Intervention and .00 and -.02 for the Brief Intervention at the six-month and one-year follow-up time points). However, parents in the General Intervention were less likely (-.08) than those in the Brief Intervention (-.01) to belong to Status 3 at the three-year follow-up, which may be explained by the low levels of health-promoting behaviors and high levels of stress in Status 3. No significant differences between the interventions were seen for Status 1 or Status 4.

As with the graphs for children, the graphs for parents (Figures 8.10-13) depict a slightly different understanding of the impact of the interventions on parents' health lifestyles:

**Figure 8.10: Probability of Parent Membership in Health Lifestyle Status 1 by Intervention (Parents Matter! Data, 2001-2006)**

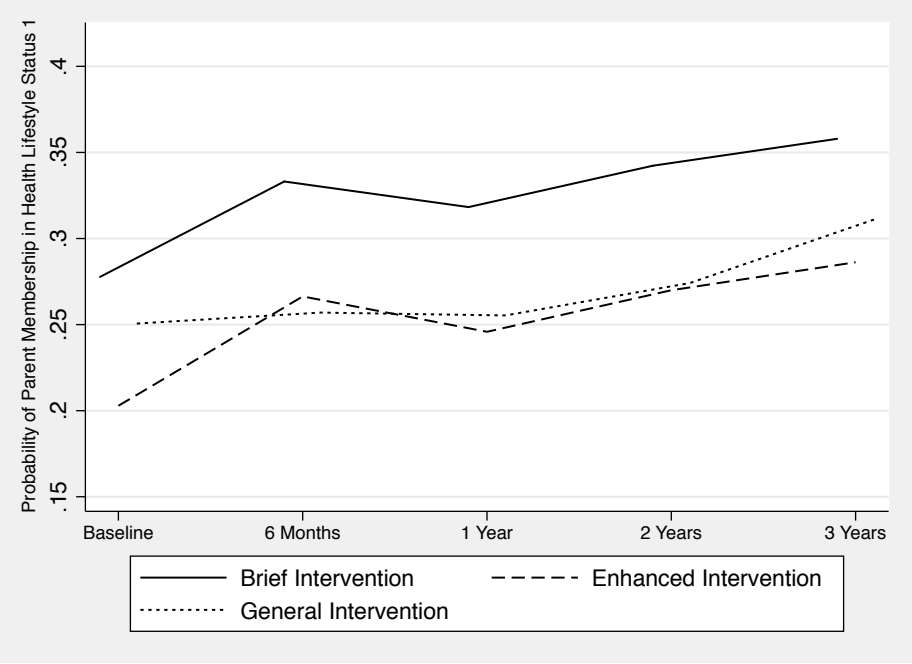



**Figure 8.11: Probability of Parent Membership in Health Lifestyle Status 2 by Intervention (Parents Matter! Data, 2001-2006)**

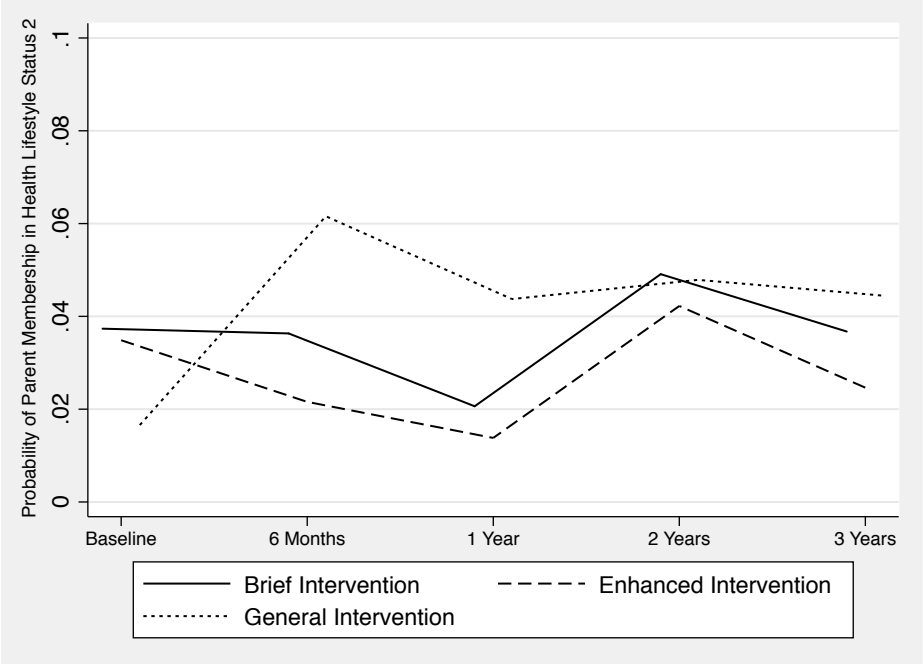


**Figure 8.12: Probability of Parent Membership in Health Lifestyle Status 3 by Intervention (Parents Matter! Data, 2001-2006)**

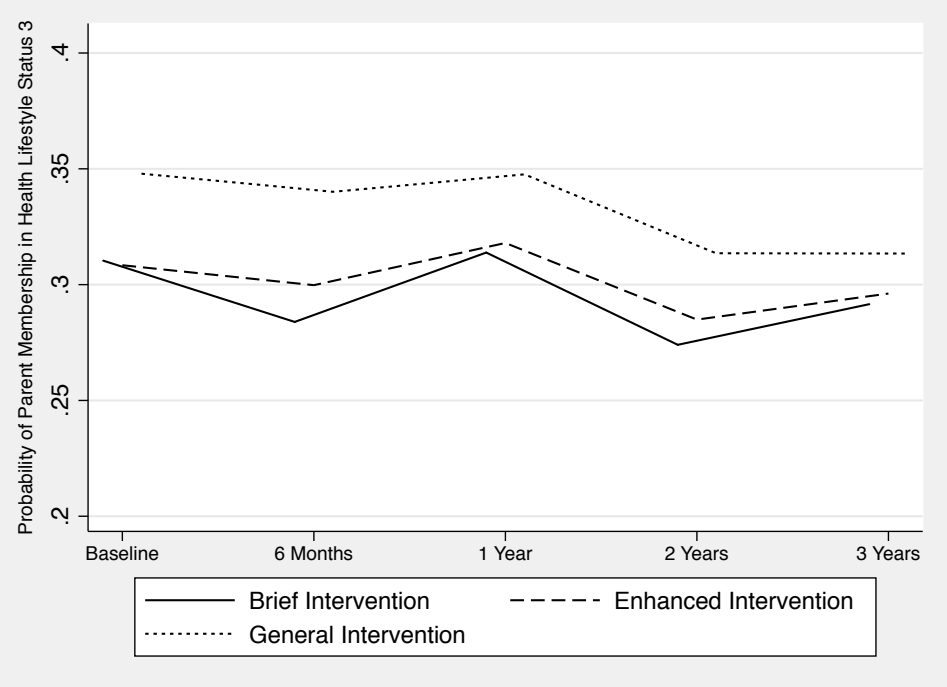
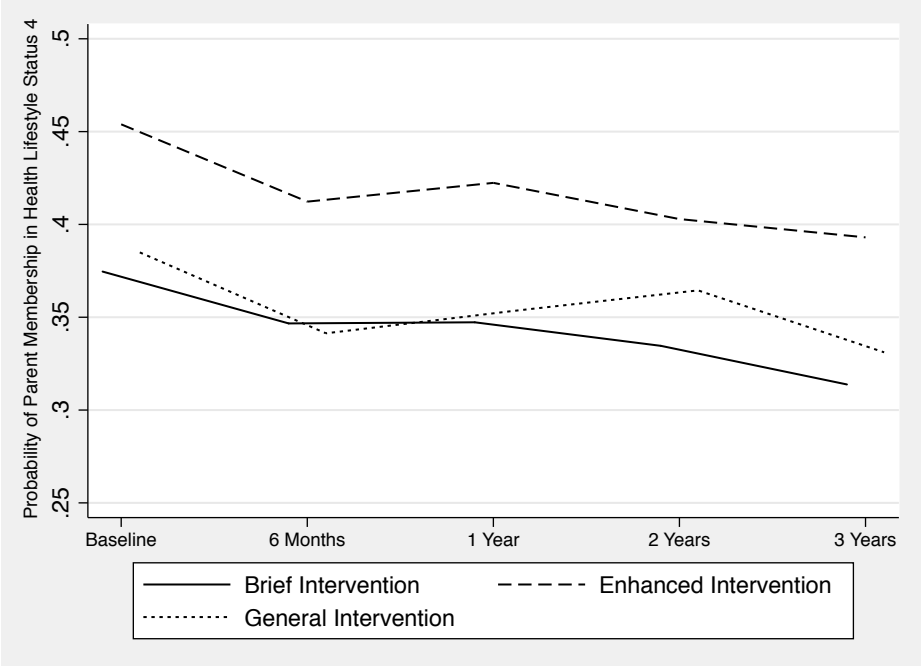



**Figure 8.13: Probability of Parent Membership in Health Lifestyle Status 4 by Intervention (Parents Matter! Data, 2001-2006)**



Parents in the Brief Intervention began Parents Matter! with a greater probability of belonging to Status 1 (Figure 8.10), a position they maintained over the duration of the study. Those in the General Intervention (Figure 8.11) experienced a spike in their probability of membership in Status 2 at the six-month follow-up, and they were also more likely to belong to Status 3 (Figure 8.12) at every time point. Parents in the Enhanced Intervention, on the other hand, had a greater probability of membership in Status 4 throughout the study (Figure 8.13). These graphs speak more to the need for measuring the differences in change in membership probability over time rather than absolute membership probability because of the fact that members of the three interventions began the study at noticeably different levels for Status 1, Status 3, and Status 4 (see Footnote 11 in Chapter 5 for an explanation of why this may have occurred).

**Question 9: Do parent-based interventions affect the intergenerational transmission of health lifestyles?**

The following tables contain the regression coefficients for the effect of two sets of interactions on children's (Table 8.5) and parents' (Table 8.6) health lifestyle status membership probabilities. The first set examines whether the interventions impacted a participant's status membership probabilities by changing the status membership probabilities of the other member of the dyad, since the other dyad member's status membership probabilities were sometimes significant in the unadjusted (see Tables A.9-10 in the Appendix) and fully adjusted (see Tables 7.7-8 in Chapter 7) analyses. The second set of interaction terms tested whether the interventions changed status membership probabilities by altering parenting practices. The tables below were fully adjusted for all

variables presented in Table 7.7 (for children) and Table 7.8 (for parents), but those variables were not displayed in Tables 8.5-6 to conserve space. See Tables A.19-20 in the Appendix for the full tables. As a reminder, these tables were not adjusted with a Bonferroni correction, despite the large number of variables included in the analysis. For this reason, variables that were significant only at the $p \leq .05$ level and perhaps even those at the $p < .01$ level may not be completely reliable.

**Table 8.5: The Effect of Interactions Between Intervention Type, Parenting Practices, and Parents' Health Lifestyles[1] on Children's Health Lifestyle Status[2] Membership Probabilities, Using a Random Effects Model with Maximum Likelihood Estimation[3] (Parents Matter! Data, 2001-2006)**

| | **Child Status 1** | | **Child Status 2** | | **Child Status 3** | | **Child Status 4** | |
|---|---|---|---|---|---|---|---|---|
| | *Healthy and low-risk* | | *Unhealthy and high-risk* | | *Unhealthy and low-risk* | | *Healthy and high-risk* | |
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Parent status 2 x Intervention | | | | | | | | |
| Brief | -.02 | (.08) | .01 | (.05) | -.02 | (.09) | .03 | (.07) |
| Enhanced | .06 | (.08) | -.02 | (.05) | -.05 | (.09) | .09 | (.07) |
| Parent status 3 x Intervention | | | | | | | | |
| Brief | .03 | (.06) | .02 | (.02) | -.03 | (.07) | .00 | (.05) |
| Enhanced | -.01 | (.06) | -.01 | (.02) | .10 | (.06) | -.07 | (.05) |
| Parent status 4 x Intervention | | | | | | | | |
| Brief | -.04 | (.06) | .05 | (.05) | -.01 | (.07) | .01 | (.05) |
| Enhanced | -.06 | (.06) | -.05 | (.05) | .07 | (.06) | .03 | (.05) |
| Monitoring: C x Intervention | | | | | | | | |
| Brief | .02 | (.02) | -.02 | (.02) | .01 | (.02) | -.01 | (.02) |
| Enhanced | -.01 | (.02) | -.01 | (.02) | .01 | (.02) | .00 | (.02) |
| Monitoring: P x Intervention | | | | | | | | |
| Brief | .03 | (.03) | .02 | (.02) | -.04 | (.03) | .00 | (.03) |
| Enhanced | .00 | (.03) | -.02 | (.02) | -.05 | (.03) | .07** | (.02) |
| Quality: C x Intervention | | | | | | | | |
| Brief | .06 | (.04) | .03 | (.04) | -.02 | (.05) | -.06 | (.04) |
| Enhanced | -.01 | (.04) | .05 | (.04) | .01 | (.05) | -.04 | (.04) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Quality: P x Intervention | | | | | | | | |
| Brief | -.01 | (.06) | .02 | (.05) | -.02 | (.07) | .03 | (.05) |
| Enhanced | -.01 | (.06) | .13* | (.05) | -.07 | (.07) | -.05 | (.05) |
| Communication: C x Intervention | | | | | | | | |
| Brief | .06 | (.03) | -.02 | (.03) | -.06 | (.04) | .01 | (.03) |
| Enhanced | .08* | (.03) | .00 | (.03) | -.08* | (.04) | -.01 | (.03) |
| Communication: P x Intervention | | | | | | | | |
| Brief | .01 | (.04) | -.01 | (.03) | -.03 | (.05) | .04 | (.03) |
| Enhanced | -.01 | (.04) | -.07* | (.03) | .03 | (.04) | .05 | (.03) |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | -.12* | (.05) | .11** | (.04) | .05 | (.05) | -.05 | (.04) |
| Enhanced | -.06 | (.05) | .06 | (.04) | .04 | (.05) | -.04 | (.04) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | -.01 | (.06) | -.03 | (.05) | .04 | (.07) | -.02 | (.06) |
| Enhanced | .05 | (.06) | .01 | (.05) | -.07 | (.07) | -.02 | (.05) |
| Constant | -.02 | (.18) | .98*** | (.15) | .16 | (.19) | -.08 | (.15) |
| Observations | 3477 | | 3477 | | 3477 | | 3477 | |
| Groups | 1001 | | 1001 | | 1001 | | 1001 | |
| Log-likelihood | -609.02 | | -46.38 | | -945.60 | | -97.51 | |
| Sigma_u | .27 | (.01) | .24 | (.01) | .30 | (.01) | .19 | (.01) |
| Sigma_e | .23 | (.00) | .19 | (.00) | .25 | (.00) | .21 | (.00) |
| Rho | .58 | (.02) | .61 | (.02) | .60 | (.02) | .46 | (.02) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[2] Children's health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex.
[3] Adjusted for all covariates in Table 7.7.

**Table 8.6: The Effect of Interactions Between Intervention Type, Parenting Practices, and Children's Health Lifestyles[1] on Parents' Health Lifestyle Status[2] Membership Probabilities, Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | **Parent Status 1** *Healthy, lower sexual risk, moderate stress* | | **Parent Status 2** *Somewhat healthy, high sexual risk, some stress* | | **Parent Status 3** *Unhealthy, some sexual risk, high stress* | | **Parent Status 4** *Unhealthy, lower sexual risk, low stress* | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Child status 2 x Intervention | | | | | | | | |
| Brief | -.01 | (.05) | .01 | (.03) | -.03 | (.05) | .03 | (.05) |
| Enhanced | .03 | (.05) | -.01 | (.03) | .00 | (.05) | -.03 | (.05) |
| Child status 3 x Intervention | | | | | | | | |
| Brief | .02 | (.03) | .00 | (.03) | -.02 | (.03) | -.03 | (.03) |
| Enhanced | -.01 | (.03) | -.03 | (.02) | .03 | (.03) | .00 | (.03) |
| Child status 4 x Intervention | | | | | | | | |
| Brief | .00 | (.05) | .02 | (.03) | .00 | (.05) | -.03 | (.05) |
| Enhanced | -.02 | (.05) | .02 | (.03) | -.03 | (.05) | -.02 | (.05) |
| Monitoring: C x Intervention | -.01 | (.01) | -.02 | (.01) | .01 | (.01) | | |
| Brief | -.01 | (.01) | .00 | (.01) | .00 | (.01) | .02 | (.01) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Enhanced | | | | | | | .01 | (.01) |
| Monitoring: P x Intervention | | | | | | | | |
| Brief | .01 | (.02) | .03 | (.02) | -.05* | (.02) | .00 | (.02) |
| Enhanced | -.01 | (.02) | .03 | (.02) | -.03 | (.02) | .02 | (.02) |
| Quality: C x Intervention | | | | | | | | |
| Brief | -.05 | (.03) | -.01 | (.03) | .02 | (.03) | .04 | (.03) |
| Enhanced | -.04 | (.03) | -.03 | (.02) | .04 | (.03) | .05 | (.03) |
| Quality: P x Intervention | | | | | | | | |
| Brief | .07 | (.04) | -.05 | (.03) | .11* | (.04) | -.17*** | (.05) |
| Enhanced | .07 | (.04) | -.01 | (.03) | -.03 | (.04) | -.03 | (.04) |
| Communication: C x Intervention | | | | | | | | |
| Brief | -.01 | (.02) | .03 | (.02) | .01 | (.02) | -.06* | (.03) |
| Enhanced | -.05* | (.02) | .01 | (.02) | .03 | (.02) | .00 | (.02) |
| Communication: P x Intervention | | | | | | | | |
| Brief | .01 | (.03) | .00 | (.02) | -.05 | (.03) | .04 | (.03) |
| Enhanced | .03 | (.03) | .00 | (.02) | -.05 | (.03) | .01 | (.03) |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | .02 | (.03) | -.02 | (.03) | -.02 | (.03) | .02 | (.03) |
| Enhanced | .05 | (.03) | .00 | (.03) | -.02 | (.03) | -.04 | (.03) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | -.13** | (.04) | -.02 | (.04) | .14** | (.04) | .00 | (.05) |
| Enhanced | .00 | (.04) | -.09** | (.04) | .07 | (.04) | .01 | (.05) |
| Constant | -.30 | (.16) | .06 | (.09) | 1.22*** | (.16) | -.03 | (.17) |
| Observations | 3386 | | 3386 | | 3386 | | 3386 | |
| Groups | 972 | | 972 | | 972 | | 972 | |
| Log-likelihood | -380.75 | (.01) | 1359.08 | (.00) | 412.91 | (.01) | 269.02 | (.01) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Sigma_u | .36 | (.00) | .10 | (.00) | .34 | (.00) | .36 | (.00) |
| Sigma_e | .14 | (.01) | .14 | (.02) | .14 | (.01) | .15 | (.01) |
| Rho | .86 | | .34 | | .85 | | .86 | |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Children's health lifestyles were determined by using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex. Child status 1 = Healthy and low-risk. Child status 2 = Unhealthy and high-risk. Child status 3 = Unhealthy and low-risk. Child status 4 = Healthy and high-risk.

[2] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[3] Adjusted for all covariates in Table 7.8.

The coefficients for the first set of interaction terms were not significant for either parents or children, which means that the probability of status membership was not altered by an intervention's affect on the status membership probabilities of the other member of the dyad (at least not as of the three-year follow-up). As for the second set of interactions (those that measured the impact of the interventions on parenting practices), it is apparent for both children and parents that parenting practices and interventions occasionally interacted and were significantly associated with status membership probabilities. However, the actual direction of the signs for some statuses is somewhat puzzling. For instance, as might be expected, children in the Enhanced Intervention who perceived high levels of parent-child communication were more likely to belong to Status 1 (.08), the healthy and low-risk lifestyle, as compared to children in the General Intervention. On the other hand, children in the Enhanced Intervention whose parents rated their relationship quality more highly were more likely to belong to Status 2 (.13), the unhealthy and high-risk lifestyle. Likewise, children whose parents were in the Enhanced Intervention and reported high levels of parental monitoring were more likely to belong to Status 4 (.07), the healthy and high-risk category.

Similarly for parents, sometimes the direction operated as expected. For instance, parents in the Enhanced Intervention who perceived they were more responsive were less likely to belong to Status 2 (-.09) and those with higher values of perceived parental monitoring were less likely to belong to Status 3 (-.05). At other times, the interaction terms indicated that members of the Brief Intervention or Enhanced Intervention with stronger parenting practices were less likely to belong to Status 1 as opposed to members of the General Intervention. To cite one example, the interaction term between the Enhanced

Intervention and children's perception of parent-child communication was -.05, and the interaction term between the Brief Intervention and parent perception of parental responsiveness was -.13. In another instance of unexpected results, parents in the Brief Intervention who reported a higher quality relationship with their children were more likely to belong to Status 3 (.11) and less likely to belong to Status 4 (-.17).

**Discussion**

The main conclusion that can be drawn from this chapter is that the Parents Matter! interventions were more effective at changing particular behaviors rather than entire lifestyles. While this finding may not map perfectly onto the hypotheses in this dissertation, it reflects the reality of the interventions: the Brief and Enhanced Interventions were solely designed to improve parenting practices and reduce sexual risk behaviors as preadolescents aged, and the General Intervention was simply intended to serve as a control that still provided some health benefits to parents and their children. As it stands, the fact that the interventions had any effect on health lifestyles and parent behaviors at all is noteworthy. Rather than stifling a discussion about intervening in health lifestyles, it points to the value of considering interventions that approach health behaviors holistically by trying to target underlying health lifestyles. An intervention specifically designed to influence health lifestyles would likely be much more effective at doing so.

Taking each question in this chapter in turn, in answer to Question 7, yes, parent-based interventions do impact the general and sexual health behaviors of children and their parents. However, while the Brief and Enhanced Interventions occasionally impacted nutrition and exercise behaviors, almost without exception the General Intervention did not

affect substance use, fighting, or sexual behaviors. A similar pattern in which the Brief and Enhanced Interventions could cross health domains in a way the General Intervention could not was also visible for parents.

To answer Question 8, yes, parent-based interventions can have some impact on child and parent health lifestyles and that impact may be felt for up to three years. In this study, however, only two statuses for children and two for parents were significantly influenced by any intervention, and when interventions were significant it was only for one or two time points. As mentioned previously, this modest finding may say more about the targeted nature of the Parents Matter! interventions in particular than about the possibility of health lifestyle interventions in general. However, preadolescence and early adolescence are such critical periods in the life course that influencing even one time point for these age groups is still worthwhile.

Analytical limitations make it difficult to answer Question 9 conclusively. Yes, it is apparent that interventions impact parenting practices, which in Chapter 7 were associated with the intergenerational transmission of health lifestyles. However, truly addressing this question would require using a structural equation model to test for mediating and moderating effects of parenting practices and the interventions on the relationship between parent and child health lifestyles. In the absence of that level of robust analysis, it is still possible to tentatively suggest that parenting practices facilitate the transmission of health lifestyles, and interventions can improve that transmission by strengthening those parenting practices and ultimately the parent-child relationship.

# Chapter 9: Conclusion

I began this dissertation by discussing the persistent health and socioeconomic disparities African Americans in the US face today. There are no simple solutions to these problems, as they stem from a history fraught with racial and economic inequality and addressing them will require a society-wide commitment to creating a future founded on justice for all rather than the few. Despite the daunting nature of the task, sociologists, social workers, public health professionals, health care professionals, and many others remain committed to reducing these disparities through initiatives like the "Healthy People 2020" program (Office of Disease Prevention and Health Promotion 2016). In line with these efforts, this dissertation embraces a social determinants of health perspective but recognizes that the most effective changes (i.e. those at the base of Frieden's Health Impact Pyramid [2010]) are unlikely to occur in the near future, while those that benefit individuals are easier but not as cost-effective as those that can reach larger populations. Mid-level interventions that focus on the places where the distal drivers of disparities are translated into obstacles or advantages allotted to individuals remain true to the social determinants paradigm while still permitting the development of programs that are immediately feasible and can lead to concrete change.

Parent-based interventions like Parents Matter! are ideal mid-level interventions that build on the existing strengths of communities and empower parents to be their children's best educator and advocate (Krauss and Miller 2012). Far from changing the life of one child at a time, the impact of these interventions can ripple out into the wider community: not just one, but all of the children in the family may benefit; friends of the

children may benefit both because of positive peer influences[15] and the presence of additional adults who can act as educators and advocates in their lives; parents may benefit by learning from the intervention and socializing with like-minded parents; and other adults in the community may benefit because of additional positive peer influences (Christakis and Fowler 2009). Over time, the very norms of the community can start to shift as changes become increasingly embedded in the social network. As these norms and social experiences change, the structures structuring the *habitus* begin to transform as well to the point where the explicit lessons of the intervention become internalized in the *habitus* and virtually automatic in everyday life. Interventions that can alter the *habitus* have the opportunity to affect a latent construct underlying multiple health behaviors rather than focusing on one health behavior at a time. Thus, parent-based interventions should be particularly well-suited to address multiple behaviors at once for both parents and children.

This study added to the empirical evidence demonstrating that health behaviors cohere into health lifestyles and proposed a bidimensional model of health lifestyles. It provided insight into the development of health lifestyles and the outcomes associated with them. It also offered provisional support for the intergenerational transmission of those lifestyles and the ability of parent-based interventions to improve a wide variety of health behaviors and tap into the mechanisms of intergenerational transmission. Yet, the study also faced several limitations, which I will discuss in the next section. I will then discuss the implications of the findings for sociology and public health, outline potential avenues for

[15] This potential benefit cannot be emphasized enough. Recall that perceived peer sexual activity was always strongly and significantly associated with high-risk classes and statuses, as well as with sexual behavior outcomes like a child's perceived odds of having sex within the next year and whether a child had touched another child's "private parts" or been touched (see Tables 6.9 and 6.11-12 in Chapter 6 and Table 7.7 in Chapter 7).

future research, and offer suggestions for how sociology and public health can benefit one another.

**Limitations**

Limitations occur at multiple stages in every study, and in this study four particular stages posed substantial limitations: conceptualizing health lifestyles, operationalizing health lifestyles and interventions, analyzing health lifestyles and interventions, and generalizing the findings. Conceptualizing health lifestyles was problematic in part due to the conflicting priorities of recognizing the development of health behaviors over the life course and desiring to arrive at a coherent set of health lifestyles to test. Health lifestyles are not static across individuals or lifetimes because behaviors are not static, so seeking to identify an underlying continuity uniting a series of behaviors whose relevance appears and disappears over the life course is complicated.

Problems operationalizing health lifestyles occurred because of issues with conceptualization and also because of the limitations of the data itself. In this study I made the decision to include attitudes toward behaviors and one-time behaviors in the operationalization of health lifestyles, in keeping with Abel (1991) but in direct opposition to Sobel (1981) and Elliott (1994). While I believe Abel's arguments are strong, certainly Sobel and Elliott would see my use of variables like children believing they will have sex within the next year or children using drugs just once as problematic, or even as measuring something other than health lifestyles. However, these decisions were driven in part by the limitations of the data. Because parents were not the focus of the intervention, fewer questions were asked about parents' behaviors than about children's behaviors, so parent behaviors

included questions about stress and attitudes toward teenagers using condoms and birth control before having sex, which may be too far removed from actual behaviors even for Abel.

Additionally, more symmetry between child and parent health behaviors would have been beneficial for assessing the intergenerational transmission of those lifestyles, but at the same time a symmetry of behaviors would not reflect a symmetry of the *meaning* of those behaviors for children and parents at their unique stages in life. However, at a minimum, it would have been ideal to draw behaviors from the same broad set of domains for children and parents rather than including delinquent behaviors for children and stress for parents. While this situation is not perfect, the data still offered a unique opportunity to study parent and child outcomes of the interventions. Indeed, the presence of a relationship between parent and child health lifestyles in the absence of matching health behaviors may have provided even more support for the intergenerational transmission of an underlying construct guiding behavioral choices. I also perhaps erred on the side of overemphasizing variables related to sexual behaviors. While this is defensible given my particular interest in how sexual behaviors "hang together" with other health behaviors to form health lifestyles, it may have biased the health lifestyle categories in some way.

The operationalization of the interventions was another key limitation, because despite the overall thoughtfulness of the Parents Matter! questionnaire and study, the interventions were not designed to address child and parent lifestyles but rather parenting practices and specific sexual behaviors and attitudes for preadolescents. Moreover, the General Intervention was intended to serve as a control arm in Parents Matter! but it could not serve as a control in this case, because of course an intervention promoting healthy

eating and exercise will affect health lifestyles. This limitation perhaps explains the lack of interesting findings in Question 8 and the lack of expected findings in Question 9. However, this operationalization of interventions still allowed for an insightful analysis of the ability of interventions to target behaviors in seemingly unrelated domains in Question 7. The answers to Question 7 may provide the rationale for developing interventions that target lifestyles, which would allow for a better assessment of the issues in Questions 8 and 9.

Actually analyzing the intergenerational transmission of these complicated health lifestyles as well as how interventions affected them posed a substantial methodological problem. Methodological limitations were most evident in Questions 5, 6, 8, and 9. The findings in this study provided evidence of associations between lifestyles, parenting practices, and interventions, but could not identify any causal relationship between them. Truly establishing the mechanisms governing the intergenerational transmission of health lifestyles and assessing the impact of interventions would require more sophisticated techniques like structural equation modeling and conditional process analysis (Hayes 2013).

An inability to widely generalize the findings is another limitation of the study. Currently, the findings can only be generalized to African American preadolescents (and perhaps their mothers, given the predominance of female "parents" and actual parents in the study) in the Southeast. Even this generalization is hampered by the convenience sample and snowball sample nature of some of the study recruitment procedures. The "limitation" of only being able to generalize to African American preadolescents is in fact a strength of the study, since African Americans and preadolescents are both under-researched demographics in health lifestyles research. As with most longitudinal studies, a longer follow-up time, larger sample size, and higher retention rate would have

strengthened the study, although the actual follow-up length, sample size, and retention rate were sufficient for this analysis.

**Impact for Sociology**

This dissertation has four main impacts for sociology. First, it expands on Cockerham's Health Lifestyles Theory (2013) to incorporate a bidimensional approach. It also provides further empirical evidence for a theory of health lifestyles, which in turn provides support for Bourdieu's *habitus* (1984) and a Bourdieusian-based theory of the reproduction of health inequalities that parallels Bourdieu's explanation of the reproduction of class inequalities (1990). Second, with the exception of Mollborn et al.'s research on preschool-age children (2014), this research represents one of the only sociological studies on health lifestyles conducted on individuals 12 years old or younger. Furthermore, it adds to the limited amount of health lifestyles and life course research on African Americans. Third, this study supplements the life course literature by examining the development of health lifestyles over time, as well as how health lifestyles at one time point can affect the trajectory of future health behaviors for years. In so doing it offers a potential mechanism for one way the "long arm of childhood" (Hayward and Gorman 2004) influences health behaviors and outcomes in adulthood. Fourth, social collectivities like religion and the family are under-researched areas in medical sociology, but they are crucial institutions in society that function, in part, to produce health (Idler 2014). This dissertation emphasizes the role of the family in the production of health and thereby seeks to promote research at the intersection of medical sociology, sociology of the family, and social stratification.

**Impact for Public Health**

In a review of the status of research on the social determinants of health, Braveman, Egerter, and Williams (2011) state that the influence of social factors on health has been definitively established. Rather than continuing to prove what has already been proven, they argue that researchers should instead seek to understand how upstream social factors influence downstream factors and use that knowledge to design and test interventions. This dissertation acts on the recommendations of Braveman, Egerter, and Williams and provides preliminary data on pathways and the efficacy of interventions. The authors also suggest that multidimensional interventions responding to several social factors at once may be more effective, and this dissertation uses Health Lifestyles Theory to provide a theoretical and empirical validation of that recommendation.

An additional impact of this dissertation on public health includes demonstrating that parent-based interventions targeted at children can directly benefit parents' health as well, which would allow public health officials to save time and money when conducting interventions. Also, the findings provide support for pre-risk prevention efforts due to evidence of different health trajectories for preadolescents based on their baseline health lifestyle. Finally, it opens up a new paradigm for public health interventions by thinking about them in terms of the upstream shaping of the *habitus* rather than focusing on downstream behavior change. If the *habitus* can be altered then health-harming behaviors may become less appealing and being healthy would be effortless. For example, the best dietary intervention would be one where the *habitus* is shaped so that people simply prefer the taste of vegetables over sugar rather than needing to fight a daily battle against the lure of sweets. The "intervention" already exists as a byproduct of the reproduction of class

(and consequently health), so if public health officials could harness the principles of that "intervention" to benefit the population then an incredible amount of good could result and we would be one step closer to dismantling some of the processes that otherwise result in persistent health disparities.

**Avenues for Future Research**

Several broad topics deserve more research focus in the future from both sociological and public health perspectives, such as the nature and development of health lifestyles over time in a wide variety of populations, how health lifestyles are transmitted in families, and how to develop interventions that promote the transmission of health-promoting and low-risk lifestyles. Additional research is needed to better understand how the family produces health, making a special effort to detect differences between the impact of the family of origin versus the family of procreation and across different family structures. Given the unexpected finding that socioeconomic status was much less significant than expected, resetting the reference level for income and education to test for a U-shaped curve in health lifestyles and behaviors may be beneficial. Most importantly, health behavior clusters for teenagers and young adults are often stratified by sex because girls and boys engage in risk behaviors at different rates (e.g. Zweig et al. 2002; Laska et al. 2009). That additional level of complexity could not be accommodated in this dissertation given the dual focus on children and parents, but stratifying the preadolescent data by sex to arrive at gender-distinct health lifestyles should be a top priority for future research.

**Connecting Sociology and Public Health**

A central takeaway from this dissertation is that sociologists and public health researchers and practitioners should be in conversation with one another, because each field offers a unique perspective that the other needs. For instance, a sociological perspective can remedy the tendency in epidemiology to focus on surface-level associations without considering latent, societal-level variables (Klinenberg 2002), since sociology highlights the importance of thinking about the many structures in which health, disease, behaviors, and attitudes are situated. The CDC has already embraced a social science-informed approach to public health research and practice to some extent (Holtzman et al. 2006), but this dialogue should be expanded and extended to all levels of public health.

While discussing the need to incorporate a sociological perspective into public health and medicine has become more common, little has been said about the need to incorporate public health in sociology. However, sociology can benefit from public health too. Taking public health seriously would force sociologists, especially medical sociologists, to rekindle the early debate in US sociology inspired by American pragmatists and sociologists like Jane Addams, George Herbert Mead, William James, and John Dewey: Is sociology an academic discipline, or is it an active one? Even if sociologists are mere mortals who cannot fix social problems in the community while also conducting research, teaching, and living, do medical sociologists in particular have a special obligation to translate their research in a way that is easily accessible for public health and medical researchers and practitioners? If so, then what steps must be taken to equip medical sociologists to speak the language of public health and medicine?

At its heart health lifestyles research reflects a truism often shared by sociology and public health—"individual" choices are typically anything but, both in why we make those decisions and in their consequences. Building on the solid foundation laid by Weber, Bourdieu, and Cockerham, research on health lifestyles shines a light on the social mechanisms that reproduce inequalities generation after generation. By providing some insight into the health lifestyles of African American preadolescents and their parents I hope this dissertation adds to the greater effort to reduce health disparities and expands our knowledge of our behaviors, ourselves, and our society.

# Appendix

## Figure A.1: Enhanced Interventions Goals and Content, Taken from Long (2004:51)

**Table I.** Enhanced Intervention: Session Goals and Content Covered

| Session | Goals | Content |
|---|---|---|
| 1 | 1. To provide group members with an understanding of the purpose and goals of the intervention.<br>2. To establish group cohesion and a desire to continue to participate in the program.<br>3. Introduce the concept of "Pyramid of Success."<br>4. To increase group members' knowledge of pre-teen and teen development.<br>5. To increase group members awareness that they influence their child's participation in health and safety behaviors. | a) Children and adolescents face many issues, such as early sexual activity, that can prevent them from being successful in life.<br>b) Children at this age are exposed to many messages about sex and are starting to form their own values about sex. Parents also must have their own message.<br>c) Because children are exposed to sexual issues at an early age, parents must start addressing these issues with children when they are in the 4th and 5th grade.<br>d) While many things influence children, parents can influence children and the decisions they make. Parents Matter! |
| 2 | 1. To teach group members general parenting practices which foster and reinforce risk-reduction. | a) The parent-child relationship may be strengthened through attention for positive behavior, encouragement, and spending time with your child.<br>b) Good parent-child communication involves listening, using open-ended questions, using "I" messages, and expressing an openness to other viewpoints.<br>c) It is important to supervise children closely as they increase in age by knowing where they are going, who they will be with, and when they will be home. |
| 3 | 1. To increase parents understanding of adolescent sexual behavior.<br>2. To make parents more aware of the need for parents to be sex educators.<br>3. To increase parents understanding of sexual issues and what it means to be sexually healthy. | a) Children are at risk for sexual health problems.<br>b) Parents are in the best position to be their child's most effective sex educator.<br>c) Parents can do many things to help their child become sexually healthy. |
| 4 | 1. To increase parents comfort/skill in discussing sex with their child. | a) Talking to children about sex is difficult but critical.<br>b) Parents need to be aware of their own sexual values and behaviors and how they are communicated to their children.<br>c) Five tools for talking to children about sex. |
| 5 | 1. To continue improving parents' comfort in discussing sex with their child.<br>2. To allow parents an opportunity to work on their communication skills with their child.<br>3. To help parents provide guidance to their children about peer pressure.<br>4. To review and summarize the major points in the intervention. | a) Good communication skills are essential.<br>b) Peer pressure becomes a greater issue as children get older.<br>c) 4-step parenting plan for peer pressure. |

**Figure A.2: Brief Intervention Goals and Content, Taken from Long (2004:58)**

**Table II.** Brief Intervention: Goals and Content

| Goals | Specific issues covered |
|---|---|
| 1. Helping parents understand children and adolescents and issues they face. | • Purpose and goals of the presentation.<br>• Issues pertaining to pre-adolescent and adolescent development.<br>• What parents can do to help their children confront these issues.<br>• Why this presentation focuses on children in the 4th and 5th grades |
| 2. Strengthening positive parenting skills. | • Effective parenting practices.<br>• Strengthening the parent-child relationship.<br>• Improving parent-child communication.<br>• Discussion of monitoring. |
| 3. Highlight parents' roles as sex educators. | • The realities of adolescent sexual behavior.<br>• Why should parents be sex educators?<br>• Sex education information.<br>• What parents can do to help their adolescent become sexually healthy. |
| 4. Improving parents' efficacy and skill in communicating about sex. | • The difficulties in discussing sexual issues.<br>• 7 tools for talking to your child about sex.<br>• Figuring out what to say.<br>• What to say when. |
| 5. Handling peer pressure. | • Peer pressure.<br>• 4-step parenting plan for peer pressure. |

**Figure A.3: General Intervention Goals and Content, Taken from Long (2004:60)**

**Table III.** General Health Intervention: Goals and Content

| Goals | Content |
|---|---|
| • Increase participants' awareness of the active role they can play in the promotion of their children's health and the prevention of disease.<br>• Educate group members regarding diseases, risk factors, and protective/preventive factors.<br>• Educate participants about benefits of physical activity/exercise and their role in promoting physical activity for their children.<br>• Educate participants about the basics of nutrition and healthy eating habits.<br>• Educate parents about the necessity of good preventative health care and strategies to locate and most effectively utilize preventative health care providers.<br>• Assist parents in learning how to foster lifelong healthy attitudes about the body, eating, and health. | • Purpose and goals of the intervention.<br>• The power of prevention—focusing on health now, not on disease later<br>• Learning the facts about cardiovascular disease, hypertension, diabetes, and asthma—what you don't know *can* hurt you!<br>• Reality of health behavior change—it's more than just good intentions<br>• Getting physical with kids—the role of fitness and exercise<br>• Meal planning<br>• Nutrition basics<br>• Preventative health care for kids<br>• Summary of program material |

**Figure A.4: Demographic Characteristics of Dyads Retained at Year 1 and Not Retained, Taken from Armistead et al (2004:78)**

**Table I.** Demographic Characteristics of Dyads Retained at Year 1 and Not Retained ($N = 460$)

| Variable | Retained at 1-year 345 | Not retained at 1-year 15 | $\chi^2$-value |
|---|---|---|---|
| Demographics | | | |
| Child Gender | | | .732 |
| % Female | 55% | 59% | |
| Child Grade | | | 1.26 |
| % in 4th grade | 43% | 48% | |
| Relationship of Caregiver to Child | | | 10.73 |
| Mother | 85% | 86% | |
| Father | 2% | 2% | |
| Grandmother | 7% | 7% | |
| Other | 6% | 5% | |
| Education | | | 7.66 |
| Never attended HS | 2% | 3% | |
| Some HS | 25% | 24% | |
| Finished HS or GED | 29% | 33% | |
| Some college | 22% | 17% | |
| 2-year college | 11% | 16% | |
| 4-year college | 6% | 4% | |
| Completed graduate or professional school | 5% | 3% | |
| Family income per month | | | 3.82 |
| $0–199 | 5% | 2% | |
| $200–499 | 16% | 16% | |
| $500–999 | 23% | 25% | |
| $1000–1999 | 27% | 29% | |
| $2000–2999 | 17% | 16% | |
| $3000–3999 | 6% | 6% | |
| $4000 + | 6% | 6% | |
| Caregiver Employment | | | 7.56 |
| Full-time | 49% | 48% | |
| Part-time | 10% | 8% | |
| Occasionally | 3% | 4% | |
| Stay at home parent | 17% | 14% | |
| Unemployed | 13% | 11% | |
| Student | 4% | 7% | |
| Other | 4% | 8% | |

## Figure A.5: Parent/Co-Parent Assessment Measures, Taken from Ball (2004:28)

**Table I.** Parent/Co-Parent Constructs Assessed

| Construct | Origin source of construct |
|---|---|
| 1. Demographic Information | Questions created by current investigative team |
| 2. Religiosity | Family Adolescent Risk Behavior and Communication Study (FARBCS) (Miller et al., 2000) |
| 3. Financial Strain | Conger (1992) |
| 4. Family Composition and Relationships | Questions created by current investigative team |
| 5. Target Child Academic Competence | Questions created by current investigative team |
| 6. Target Child Involvement in Activities | Questions created by current investigative team |
| 7. Stress Perception | Perceived Stress Scale (Cohen et al., 1983) |
| 8. Child Characteristics: | |
| Problem Behavior | Child Behavior Checklist (CBCL): Delinquent and Aggression subscales, (Achenbach, 1991) |
| Competence | "What I am Like" (Harter, 1982) |
| Mood | Faces Scale (Andrews & Withey, 1976) |
| Substance Use | Questions created by current investigative team |
| 9. Child Physical Development | Pubertal Development Scale (Petersen et al., 1988) |
| 10. Perception of Menstruation | Questions created by current investigative team |
| 11. Child Sexual Behavior | Questions created by current investigative team |
| 12. Parent Sexual Behavior | Questions created by current investigative team |
| 13. Sibling Sexual Behavior | Questions created by current investigative team |
| 14. Parent-Child Relationship Quality | Parent-Child Satisfaction Measure (Jaccard et al., 1996; Landesman & Jaccard, 1988) |
| 15. Parent Monitoring/Supervision | Questions based on measures from the Family Adolescent Risk Behavior and Communication Study (FARBCS) (Miller et al., 2000 & The Family Health Research Group, 1998) |
| 16. Monitoring by Other Adult | Questions based on measures from the Family Adolescent Risk Behavior and Communication Study (FARBCS) (Miller et al., 2000 & The Family Health Research Group, 1998) |
| 17. Positive Parenting | Alabama Parenting Scale: Positive Parenting Subscale (Shelton et al., 1996) |
| 18. Parent-Child General Communication | Questions derived from Barnes and Olson (1985) and based on measures from the Family Adolescent Risk Behavior and Communication Study (FARBCS) (Miller et al., 2000) |
| 19. Parenting Efficacy/Control | Parenting Locus of Control Scale (Campis et al., 1986) |
| 20. Communication about Sex Topics | Questions based on measures from the Family Adolescent Risk Behavior and Communication Study (FARBCS) (Miller et al., 2000) |
| 21. Responsiveness | Questions based on measures from the Family Adolescent Risk Behavior and Communication Study (FARBCS) (Miller et al., 2000 & The Family Health Research Group, 1998) |
| 22. Access to Information About Sex | Questions created by current investigative team |
| 23. Attitudes: | |
| People Having Sex (general) | Questions created by current investigative team |
| Teens, Dating, and Sex | Questions created by current investigative team |
| Knowledge and Teens Having Sex | Questions created by current investigative team |
| Own Child Dating and Having Sex | Questions created by current investigative team |
| Teaching Teens About Sex | Questions created by current investigative team |
| 24. Perceived Risk/Vulnerability | Questions created by current investigative team |
| 25. Gender Role Beliefs/Behavior | Office of Women's Health (Hall & Halberstadst, 1981; Hoffman & Kloska, 1985; Moore, 1985) |
| 26. Nutrition and Exercise Habits | Questions created by current investigative team and based on PMP General Intervention content |
| 27. Program Evaluation/Satisfaction | Questions created by current investigative team |

**Figure A.6: Child Assessment Measures, Taken from Ball (2004:29)**

**Table II.** Child Constructs Assessed

| Construct | Origin source of construct |
|---|---|
| 1. Demographic Information | Questions created by current investigative team |
| 2. Child Characteristics: | |
| Problem Behavior | Child Behavior Checklist (CBCL): Delinquency and Aggression subscales, (Achenbach, 1991) |
| Competence | "What I Am Like" (Harter, 1982) |
| Mood | Faces Scale (Andrews & Withey, 1976) |
| Substance Use | Questions created by current investigative team |
| 3. Parent-Child & CoParent-Child Relationship Quality | Parent-Child Satisfaction Measure (Jaccard et al., 1996; Landesman & Jaccard, 1988) |
| 4. Monitoring/Supervision (Parent & Co-Parent) | Questions based on measures from the Family Adolescent Risk Behavior and Communication Study (FARBCS) (Miller et al., 2000 & The Family Health Research Group, 1998) |
| 5. Positive Parenting (Parent & Co-Parent) | Alabama Parenting Scale: Positive Parenting Subscale (Shelton et al., 1996) |
| 6. Parent-Child & Coparent-Child General Communication | Questions derived from Barnes and Olson (1985) and based on measures from the Family Adolescent Risk Behavior and Communication Study (FARBCS) (Miller et al., 2000) |
| 7. Communication about Sex Topics (Parent & Co-Parent) | Questions based on measures from the Family Adolescent Risk Behavior and Communication Study (FARBCS) (Miller et al., 2000) |
| 8. Responsiveness (Parent & Co-Parent) | Questions based on measures from the Family Adolescent Risk Behavior and Communication Study (FARBCS) (Miller et al., 2000) |
| 9. Access to Information About Sex | Questions created by current investigative team |
| 10. Sexual Behavior | Some items based on Adolescent Sexual Activity Index (Hansen et al., 1999), but structure of scale and wording were generated for this project based on extensive pilot testing |
| 11. Sexual Intentions | Questions created by current investigative team |
| 12. Self-Efficacy for Risk Reduction | Questions created by current investigative team |
| 13. Attitudes: | |
| People Having Sex (general) | Questions created by current investigative team |
| Having Sex (personal) | Questions created by current investigative team |
| Birth Control, Condoms, and Responsibility | Questions created by current investigative team |
| 14. Peer Norms | Questions created by current investigative team |
| 15. Perceived Parent and Peer Attitudes | Questions created by current investigative team |
| 16. Perceived Risk | Questions created by current investigative team |
| 17. Gender Role Beliefs/Behavior | Office of Women's Health (Hall & Halberstadst, 1981; Hoffman & Kloska, 1985; Moore, 1985) |
| 18. Nutrition and Exercise Habits | Questions created by current investigative team and based on PMP General Intervention content |
| 19. Parent Support for Nutrition and Exercise | Questions created by current investigative team and based on PMP General Intervention content |

**Table A.1: ANOVA for Baseline Child[1] and Parent[2] Health Lifestyle Status Membership Probabilities with Follow-Up Pairwise Comparisons[3] for Significant Differences Between Intervention Groups (Parents Matter! Data, 2001-2006)**

| **Population and Interventions** | **Status 1** *F*- statistic | **Status 2** *F*- statistic | **Status 3** *F*- statistic | **Status 4** *F*- statistic |
|---|---|---|---|---|
| *Children* | .53 | 1.12 | 1.62 | 3.01* |
| Enhanced vs. General | n.s. | n.s. | n.s. | $\mu_F$: .07 $\mu_G$: .11 μ difference: .05* |
| Brief vs. General | n.s. | n.s. | n.s. | n.s. |
| Brief vs. Enhanced | n.s.[4] | n.s. | n.s. | n.s. |
| *Parents* | 4.08* | 1.82 | 1.09 | 4.62* |
| Enhanced vs. General | n.s. | n.s. | n.s. | $\mu_F$: .45 $\mu_G$: .39 μ difference: .07* |
| Brief vs. General | n.s. | n.s. | n.s. | n.s. |
| Brief vs. Enhanced | $\mu_B$: .28 $\mu_F$: .20 μ difference: .08* | n.s. | n.s. | $\mu_B$: .37 $\mu_F$: .45 μ difference: .08* |

* = $p \leq .05$

[1] Children's baseline health lifestyle status was determined using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex.

[2] Parents' baseline health lifestyle status was determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[3] Pairwise comparisons were run using Tukey's Honestly Significant Difference (HSD) test after ANOVA.

[4] Not significant.

**Figure A.7: Probability of Child Getting Physical Activity Daily Over Time by Child Latent Class at Baseline, Adjusted for All Child Covariates (Parents Matter! Data, 2001-2006)**

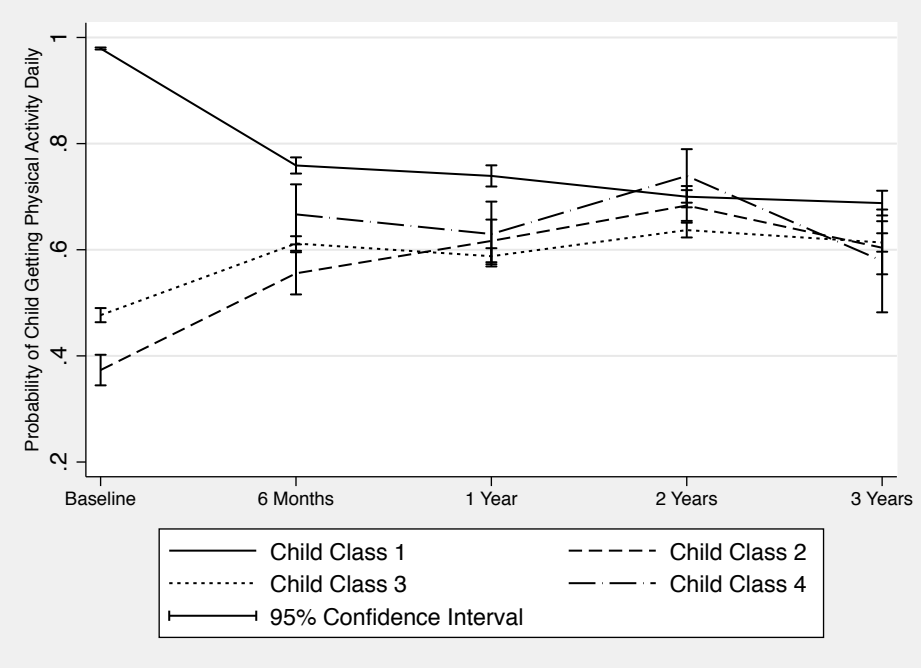



**Figure A.8: Probability of Child Drinking Alcohol Over Time by Child Latent Class at Baseline, Adjusted for All Child Covariates (Parents Matter! Data, 2001-2006)**

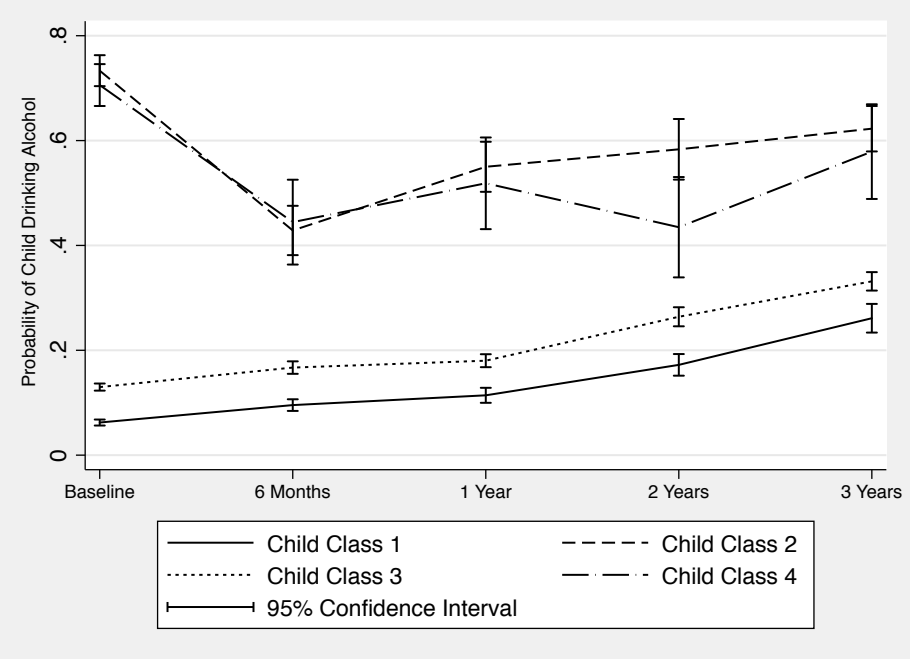


**Figure A.9: Probability of Child Using Drugs Over Time by Child Latent Class at Baseline, Adjusted for All Child Covariates (Parents Matter! Data, 2001-2006)**

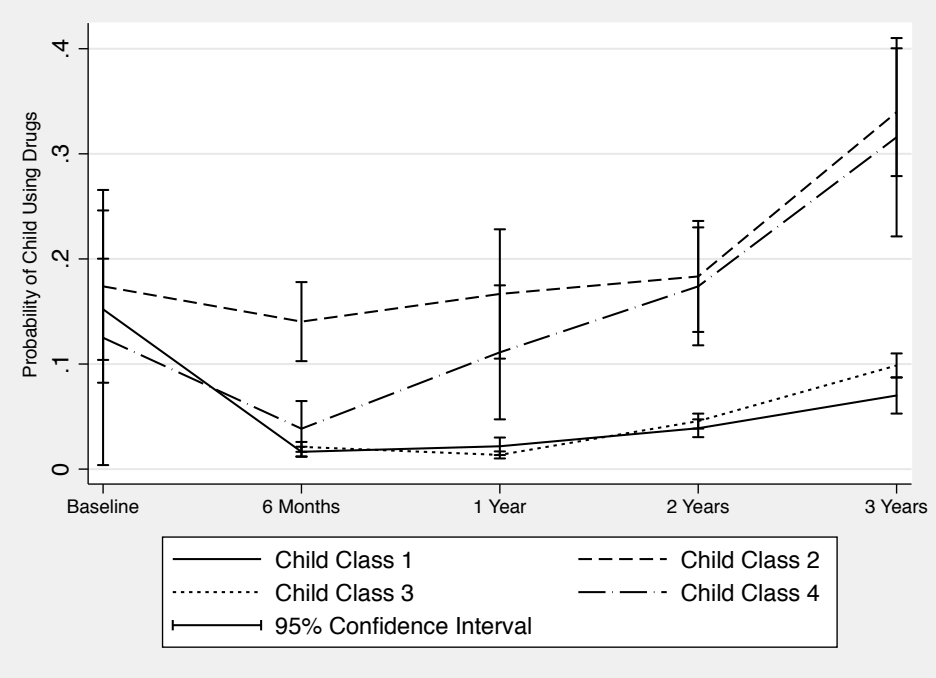



**Figure A.10: Probability of Child Touching Boyfriend/Girlfriend Under Clothing or Being Touched Over Time by Child Latent Class at Baseline, Adjusted for All Child Covariates (Parents Matter! Data, 2001-2006)**

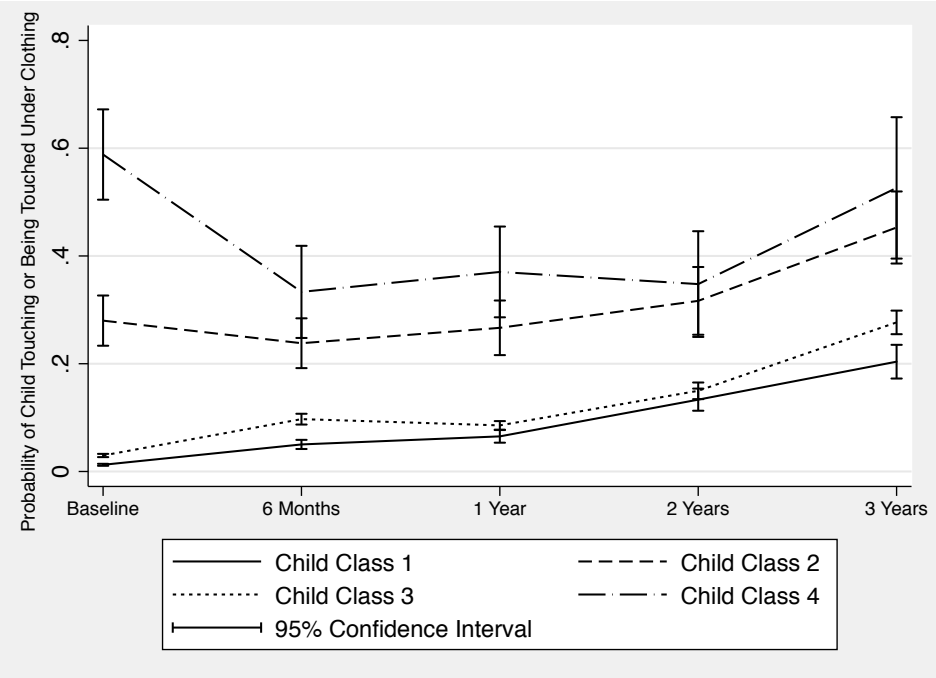


**Figure A.11: Probability of Parent Reading Nutrition Labels Over Time by Parent Latent Class at Baseline, Adjusted for All Parent Covariates (Parents Matter! Data, 2001-2006)**

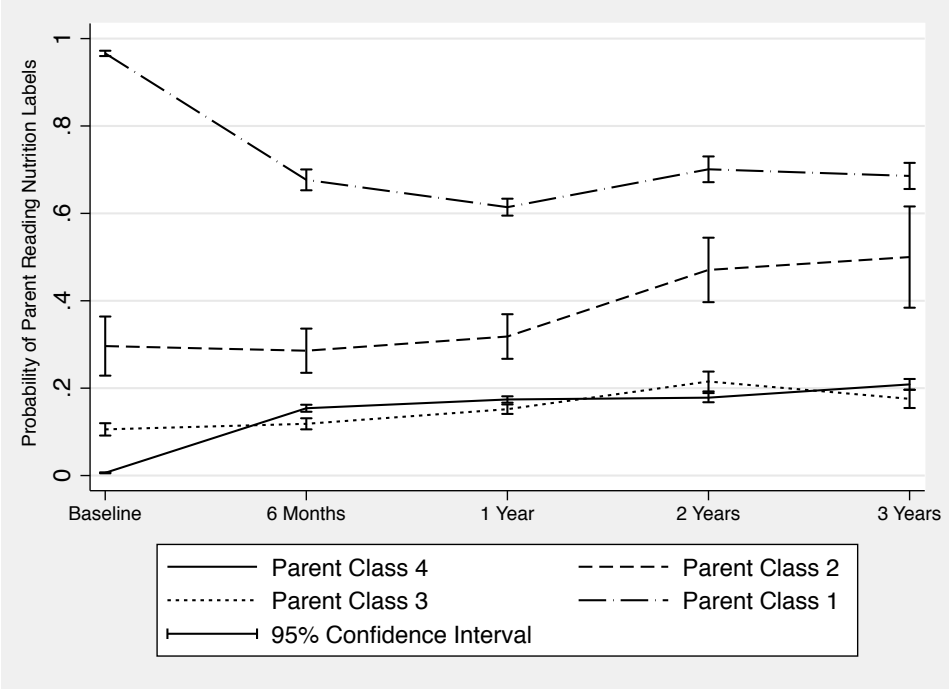



**Figure A.12: Probability of Parent Exercising for at Least 20 Minutes a Day Three Times a Week Over Time by Parent Latent Class at Baseline, Adjusted for All Parent Covariates (Parents Matter! Data, 2001-2006)**

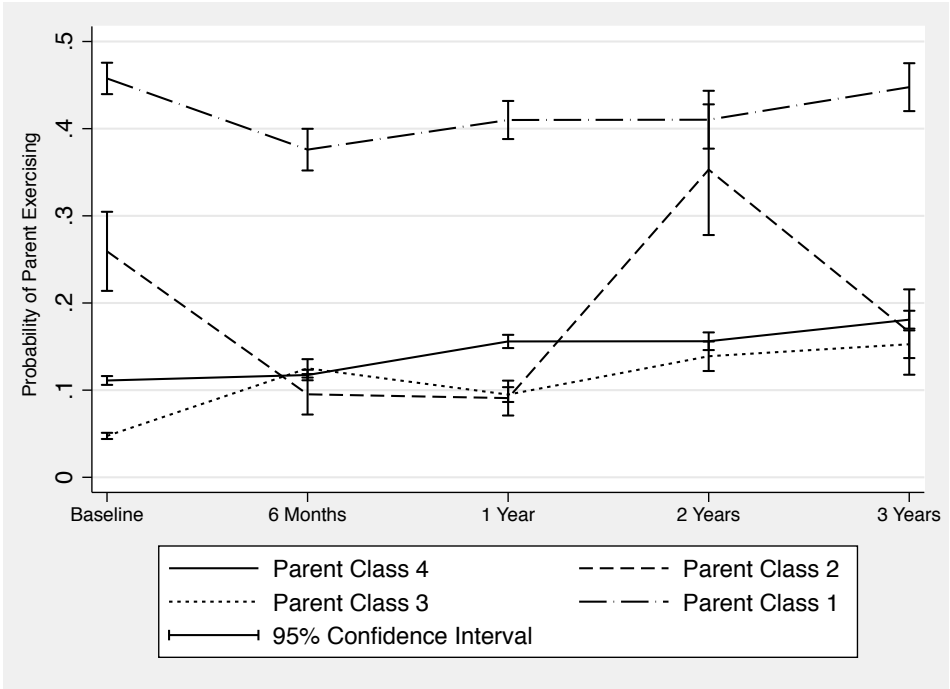


**Figure A.13: Probability of Parent Having Multiple Sexual Partners in the Past Six Months Over Time by Parent Latent Class at Baseline, Adjusted for All Parent Covariates (Parents Matter! Data, 2001-2006)**

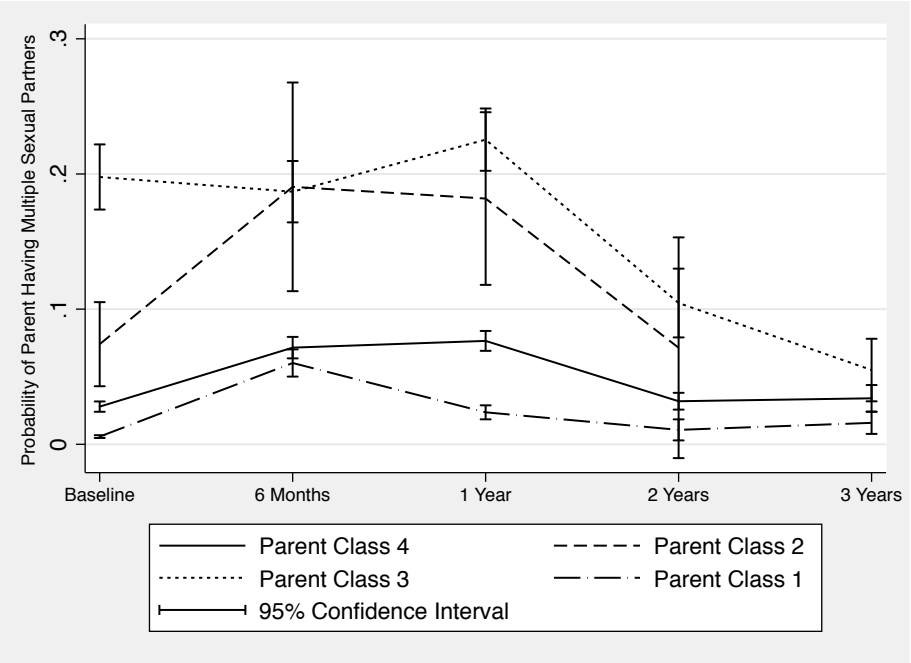



**Figure A.14: Probability of Parent Not Using Birth Control at Last Sex Over Time by Parent Latent Class at Baseline, Adjusted for All Parent Covariates (Parents Matter! Data, 2001-2006)**

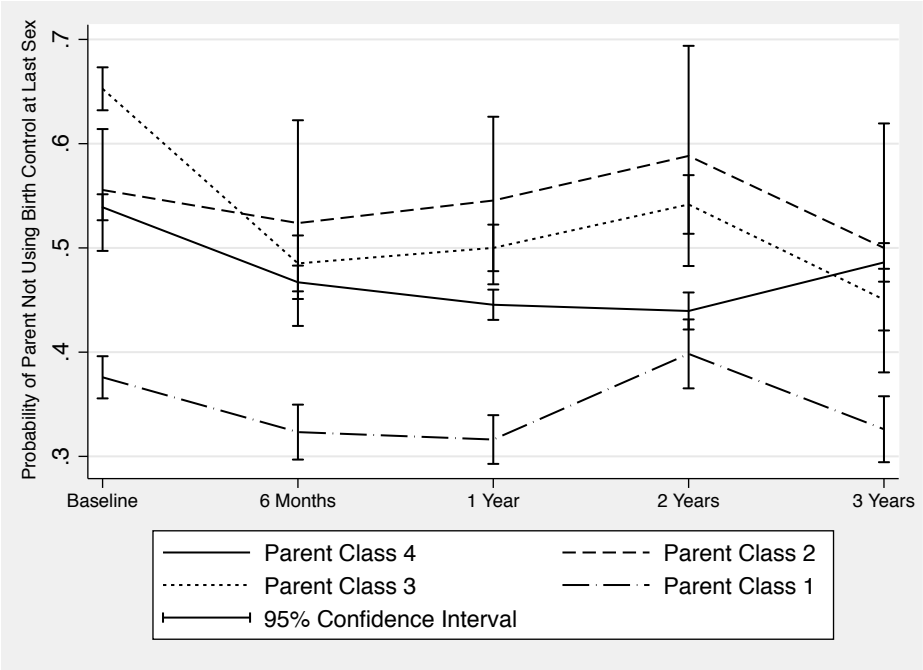


**Figure A.15: Probability of Parent Feeling Able to Handle Life Events Over Time by Parent Latent Class at Baseline, Adjusted for All Parent Covariates (Parents Matter! Data, 2001-2006)**

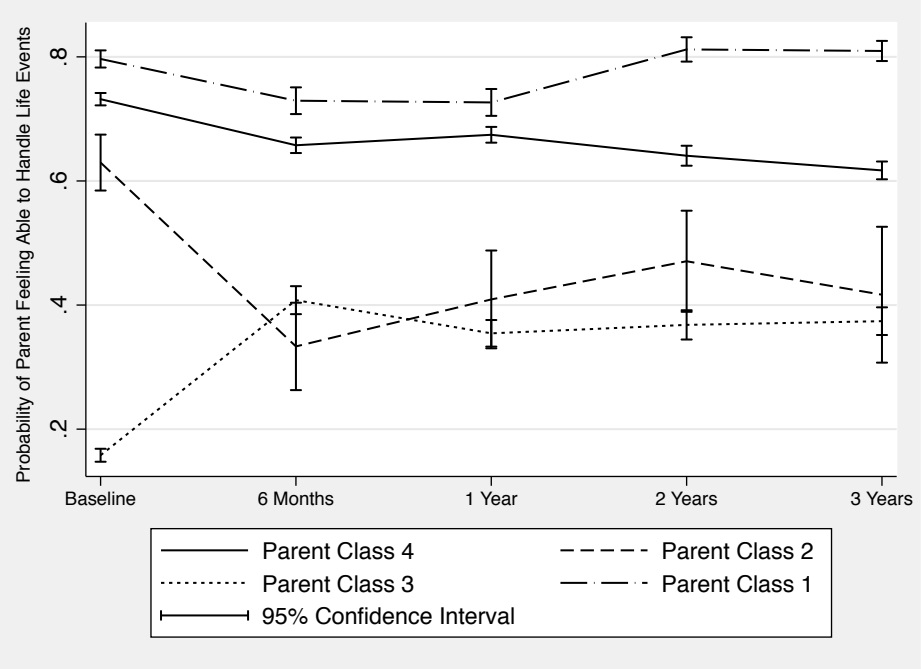


**Table A.2: Unadjusted Relative Risk Ratios (RRR) for Child Latent Class Membership at Baseline Using Multinomial Logistic Regression (Parents Matter! Data, 2001-2006, *N* = 890[1])**

| | Child Class 2[2] *Unhealthy and high-risk* | | Child Class 3[2] *Unhealthy and low-risk* | | Child Class 4[2] *Healthy and high-risk* | |
|---|---|---|---|---|---|---|
| **Variable** | **Unadjusted RRR** | **(95% CI)** | **Unadjusted RRR** | **(95% CI)** | **Unadjusted RRR** | **(95% CI)** |
| Female[3] | .76 | (.48, 1.2) | 1.06 | (.81, 1.40) | .33** | (.16, .66) |
| Child age | 1.40* | (1.05, 1.86) | 1.12 | (.95, 1.33) | 1.67* | (1.12, 2.48) |
| Grade[4] | 1.28 | (.81, 2.04) | 1.38* | (1.05, 1.82) | 2.09* | (1.05, 4.13) |
| Parent education[5] | | | | | | |
| High school diploma/GED | 1.71 | (.95, 3.10) | 1.47* | (1.03, 2.11) | .74 | (.30, 1.81) |
| Some college | 1.26 | (.59, 2.65) | 2.53*** | (1.67, 3.82) | 1.59 | (.65, 3.88) |
| AA/technical degree | 1.39 | (.60, 3.23) | 2.38*** | (1.47, 3.84) | .74 | (.20, 2.75) |
| College degree or higher | 1.39 | (.60, 3.23) | 2.09** | 1.29, 3.39) | 1.47 | (.52, 4.20) |
| Monthly family income[6] | | | | | | |
| $500-999 | 1.97 | (.94, 4.15) | 1.09 | (.72, 1.66) | 1.36 | (.51, 3.57) |
| $1000-1999 | 1.86 | (.89, 3.86) | 1.56* | (1.05, 2.31) | .86 | (.31, 2.42) |
| $2000+ | 2.02 | (.96, 4.23) | 1.82** | (1.22, 2.73) | 1.70 | (.67, 4.31) |
| Parent employment[7] | | | | | | |
| Part-time | 2.27* | (1.11, 4.65) | 1.57 | (.95, 2.57) | 2.31 | (.75, 7.10) |
| Full-time | 1.10 | (.66, 1.82) | 1.59** | (1.19, 2.12) | 2.20* | (1.06, 4.57) |
| Family structure[8] | | | | | | |
| Steady partner | 1.16 | (.51, 2.62) | .81 | (.51, 1.26) | .85 | (.26, 2.83) |
| Cohabiting | 1.19 | (.44, 3.19) | 1.20 | (.70, 2.06) | 1.45 | (.39, 5.43) |
| Married | 1.74 | (.81, 3.70) | 1.51 | (.99, 2.30) | 1.86 | (.65, 5.31) |
| Religious attendance[9] | | | | | | |
| Once or twice a month | 1.25 | (.65, 2.42) | .78 | (.52, 1.17) | 1.15 | (.48, 2.78) |
| Once a week or more | .95 | (.54, 1.67) | 1.07 | (.78, 1.48) | .75 | (.34, 1.62) |
| Does well on schoolwork | .45** | (.28, .73) | .50*** | (.38, .67) | .34** | (.17, .66) |
| Happy in the past month | .21*** | (.12, .39) | .48** | (.30, .77) | .27** | (.12, .61) |
| Peers who have had sex[10] | 2.31** | (1.32, 4.06) | 1.17 | (.83, 1.65) | 8.38*** | (3.09, 22.77) |
| Only a few | 3.79*** | (2.03, 7.07) | .96 | (.61, 1.51) | 22.08*** | (8.25, 59.14) |

| | | | | | | |
|---|---|---|---|---|---|---|
| About half or more | | | | | | |
| Believes parent think s/he should wait to have sex | .69 | (.38, 1.23) | 1.27 | (.87, 1.87) | .65 | (.29, 1.45) |
| Parent believes no sex before marriage[11] | | | | | | |
| A little true | 1.26 | (.63, 2.52) | 1.36 | (.92, 2.00) | .88 | (.37, 2.09) |
| Very true | 1.41 | (.74, 2.65) | 1.20 | (.84, 1.72) | .72 | (.32, 1.63) |
| Site[12] | | | | | | |
| Atlanta | .58 | (.31, 1.10) | .64* | (.45, .90) | 1.60 | (.62, 4.09) |
| Little Rock | 1.38 | (.79, 2.40) | 1.20 | (.85, 1.68) | 2.20 | (.88, 5.47) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] This is the total sample size for the adjusted analysis, but the exact sample size for the individual variables in the unadjusted analysis may differ.

[2] Class 1 (a healthy and low-risk lifestyle) is the reference category.

[3] Male is the reference category.

[4] 4th grade is the reference category, and 5th grade is the indicator value.

[5] Less than a high school diploma or GED is the reference category.

[6] $0-499 is the reference category.

[7] Other employment status (e.g. student, unemployed) is the reference category.

[8] No steady partner is the reference category.

[9] Never or a few times a year is the reference category.

[10] None is the reference category.

[11] Not at all true is the reference category.

[12] Athens is the reference category.

**Table A.3: Unadjusted Relative Risk Ratios (RRR) for Parent Latent Class Membership at Baseline Using Multinomial Logistic Regression (Parents Matter! Data, 2001-2006, *N* = 876[1])**

| | **Parent Class 2[2]** *Somewhat healthy, high sexual risk, some stress* | | **Parent Class 3[2]** *Unhealthy, some sexual risk, high stress* | | **Parent Class 4[2]** *Unhealthy, lower sexual risk, low stress* | |
|---|---|---|---|---|---|---|
| **Variable** | **Unadjusted RRR** | **(95% CI)** | **Unadjusted RRR** | **(95% CI)** | **Unadjusted RRR** | **(95% CI)** |
| Female[3] | 1.74 | (.22, 13.90) | 4.00* | (1.10, 14.54) | 1.68 | (.79, 3.59) |
| Parent age | 1.00 | (.96, 1.04) | .94*** | (.92, .97) | .98* | (.96, 1.00) |
| Education[4] | | | | | | |
| High school diploma/GED | | | | | | |
| Some college | .28* | (.08, .92) | .77 | (.46, 1.28) | 1.21 | (.77, 1.92) |
| AA/technical degree | .62 | (.24, 1.61) | .43** | (.25, .75) | .82 | (.52, 1.30) |
| College degree or higher | .44 | (.13, 1.50) | .39** | (.20, .74) | .84 | (.49, 1.42) |
| Monthly family income[5] | .50 | (.16, 1.54) | .23*** | (.11, .46) | .69 | (.41, 1.16) |
| $500-999 | .48 | (.13, 1.76) | .98 | (.55, 1.74) | .94 | (.56, 1.59) |
| $1000-1999 | 1.12 | (.40, 3.18) | .82 | (.46, 1.43) | 1.32 | (.81, 2.16) |
| $2000+ | .57 | (.20, 1.63) | .29*** | (.17, .52) | .70 | (.44, 1.11) |
| Employment[6] | | | | | | |
| Part-time | 2.28 | (.77, 6.76) | 1.06 | (.55, 2.07) | 1.51 | (.86, 2.65) |
| Full-time | 1.01 | (.46, 2.24) | .83 | (.56, 1.22) | 1.27 | (.92, 1.76) |
| Family structure[7] | | | | | | |
| Steady partner | .49 | (.13, 1.85) | .50* | (.27, .93) | .81 | (.47, 1.42) |
| Cohabiting | 1.36 | (.37, 5.09) | .72 | (.35, 1.49) | .96 | (.50, 1.86) |
| Married | .75 | (.25, 2.29) | .38** | (.21, .67) | .84 | (.50, 1.40) |
| Age of sexual debut[8] | | | | | | |
| 13-15 | .49 | (.15, 1.63) | 1.41 | (.59, 3.39) | 1.25 | (.59, 2.64) |
| 16-17 | .17** | (.04, .64) | .89 | (.37, 2.15) | 1.07 | (.51, 2.24) |
| 18+ | .33 | (.09, 1.19) | .65 | (.26, 1.61) | 1.00 | (.47, 2.14) |
| Birth control first sex | .34* | (.13, .85) | .64* | (.43, .95) | .91 | (.66, 1.25) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Condom use first sex | .55 | (.26, 1.19) | .66* | (.45, .97) | .91 | (.67, 1.24) |
| Believes it's his/her job to teach child about sex | .28* | (.11, .75) | .55 | (.28, 1.06) | .71 | (.39, 1.28) |
| Religious attendance[9] | | | | | | |
| Once or twice a month | 2.76 | (.88, 8.69) | 1.67 | (.95, 2.92) | 1.55 | (.93, 2.56) |
| Once a week or more | 1.53 | (.58, 4.00) | .64* | (.41, .98) | 1.05 | (.74, 1.51) |
| Believes religion is very important | 1.03 | (.29, 3.68) | .38** | (.22, .67) | .47** | (.29, .78) |
| Site[10] | | | | | | |
| Atlanta | .68 | (.26, 1.79) | .62 | (.38, 1.02) | .76 | (.51, 1.14) |
| Little Rock | .97 | (.41, 2.31) | 1.05 | (.67, 1.65) | .89 | (.61, 1.31) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] This is the total sample size for the adjusted analysis, but the exact sample size for the individual variables in the unadjusted analysis may differ.

[2] Class 4 (a healthy and low-risk lifestyle) is the reference category.

[3] Male is the reference category.

[4] Less than a high school diploma or GED is the reference category.

[5] $0-499 is the reference category.

[6] Other employment status (e.g. student, unemployed) is the reference category.

[7] No steady partner is the reference category.

[8] 12 or younger is the reference category.

[9] Never or a few times a year is the reference category.

[10] Athens is the reference category.

**Table A.4: Unadjusted Odds Ratios (OR) Using Logistic Regression of the Likelihood Children Will Have Sex Within the Next Year (Parents Matter! Data, 2001-2006)**

| | Baseline[1] (N = 887[2]) | | 1-Year Follow-Up[1] (N = 715[2]) | | 3-Year Follow-Up[1] (N = 594[2]) | |
|---|---|---|---|---|---|---|
| **Variable** | **Unadjusted OR** | **(95% CI)** | **Unadjusted OR** | **(95% CI)** | **Unadjusted OR** | **(95% CI)** |
| Child latent class at baseline[3] | | | | | | |
| 2 | 6.02*** | (2.87, 12.68) | 4.87*** | (2.19, 10.84) | 3.29*** | (1.75, 6.20) |
| 3 | .87 | (.44, 1.72) | 1.84 | (.98, 3.46) | 1.47 | (.96, 2.25) |
| 4 | 17.46*** | (7.61, 40.04) | 6.00*** | (2.29, 15.71) | 4.62** | (1.78, 12.00) |
| Intervention group[4] | | | | | | |
| Brief | .75 | (.44, 1.30) | .87 | (.51, 1.49) | 1.03 | (.66, 1.60) |
| Enhanced | .56 | (.31, 1.00) | .70 | (.41, 1.20) | 1.14 | (.75, 1.74) |
| Female[5] | .45** | (.27, .72) | .30*** | (.19, .48) | .34*** | (.24, .48) |
| Child age | 1.59** | (1.19, 2.10) | 1.95*** | (1.49, 2.54) | 1.91*** | (1.54, 2.36) |
| Grade[7] | 1.49 | (.92, 2.41) | 1.46** | (1.11, 1.91) | 1.78*** | (1.43, 2.22) |
| Parent education[8] | | | | | | |
| High school diploma/GED | .65 | (.36, 1.19) | .58 | (.32, 1.04) | .86 | (.54, 1.38) |
| Some college | .54 | (.27, 1.08) | .42 | (.21, .84) | .84 | (.51, 1.40) |
| AA/technical degree | .55 | (.24, 1.26) | .49 | (.22, 1.09) | .87 | (.48, 1.57) |
| College degree or higher | .59 | (.26, 1.34) | .94 | (.48, 1.84) | .68 | (.37, 1.26) |
| Monthly family income[9] | | | | | | |
| $500-999 | 1.56 | (.79, 3.11) | 1.22 | (.57, 2.60) | 1.06 | (.56, 2.03) |
| $1000-1999 | .95 | (.47, 1.92) | 1.17 | (.58, 2.36) | 1.08 | (.59, 1.97) |
| $2000+ | .71 | (.34, 1.48) | 1.33 | (.68, 2.62) | 1.09 | (.61, 1.96) |
| Parent employment[10] | | | | | | |
| Part-time | .54 | (.22, 1.31) | .81 | (.36, 1.82) | .84 | (.43, 1.63) |
| Full-time | .58* | (.35, .95) | .81 | (.51, 1.28) | 1.10 | (.75, 1.60) |
| Family structure[11] | | | | | | |
| Steady partner | 1.02 | (.45, 2.34) | .82 | (.41, 1.61) | 1.20 | (.73, 1.98) |
| Cohabiting | 1.17 | (.46, 2.98) | 1.37 | (.66, 2.86) | 2.01* | (1.08, 3.74) |
| Married | 1.02 | (.48, 2.15) | 1.33 | (.75, 2.36) | 1.13 | (.72, 1.79) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Religious attendance[12] | | | | | | |
| Once or twice a month | 2.11* | (1.04, 4.28) | 1.06 | (.54, 2.07) | 1.12 | (.66, 1.90) |
| Once a week or more | 1.45 | (.78, 2.70) | 1.09 | (.64, 1.87) | .94 | (.63, 1.42) |
| Does well on schoolwork | .51** | (.32, .82) | .48** | (.31, .74) | .50*** | (.35, .70) |
| Happy in the past month | .34*** | (.20, .56) | .70 | (.43, 1.15) | .55** | (.38, .79) |
| Peers who have had sex[13] | | | | | | |
| Only a few | 2.91** | (1.59, 5.32) | 3.36*** | (1.79, 6.29) | 6.57** | (1.96, 22.04) |
| About half or more | 7.68*** | (4.29, 13.74) | 7.33*** | (4.00, 13.42) | 19.06*** | (5.92, 61.43) |
| Believes parent think s/he should wait to have sex[14] | .51* | (.29, .89) | .38*** | (.23, .62) | .32*** | (.21, .48) |
| Parent believes no sex before marriage[15] | | | | | | |
| A little true | .53 | (.28, 1.00) | .82 | (.44, 1.55) | .57* | (.35, .93) |
| Very true | .59 | (.34, 1.04) | .97 | (.55, 1.72) | .56* | (.35, .89) |
| Site[16] | | | | | | |
| Atlanta | 1.22 | (.64, 2.33) | 1.40 | (.76, 2.58) | .98 | (.61, 1.58) |
| Little Rock | 1.39 | (.77, 2.50) | 1.38 | (.79, 2.41) | 1.16 | (.78, 1.73) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Time-varying covariates (i.e. all variables except for baseline latent class, gender, race, parent's education, and site) are matched with each time point. For instance, child's grade level at the one-year follow-up time point is used in that analysis rather than the child's grade level at baseline.

[2] This is the total sample size for the adjusted analysis, but the exact sample size for the individual variables in the unadjusted analysis may differ.

[3] Class 1 (a healthy and low-risk lifestyle) is the reference category.

[4] General Intervention is the reference category.

[5] Male is the reference category.

[6] Non-black is the reference category.

[7] 4th grade is the reference category, and 5th grade is the indicator value.

[8] Less than a high school diploma or GED is the reference category.

[9] $0-499 is the reference category.

[10] Other employment status (e.g. student, unemployed) is the reference category.

[11] No steady partner is the reference category.

[12] Never or a few times a year is the reference category.

[13] None is the reference category.

[14] Not at all or a little true is the reference category.
[15] Not at all true is the reference category.
[16] Athens is the reference category.

**Table A.5: Unadjusted Odds Ratios (OR) Using Logistic Regression of Whether Children Have Willingly Touched Boy/Girlfriend's "Private Parts" or Been Touched (Parents Matter! Data, 2001-2006)**

| | Baseline[1] (N = 889[2]) | | 1-Year Follow-Up[1] (N = 715[2]) | | 3-Year Follow-Up[1] (N = 594[2]) | |
|---|---|---|---|---|---|---|
| **Variable** | **Unadjusted OR** | **(95% CI)** | **Unadjusted OR** | **(95% CI)** | **Unadjusted OR** | **(95% CI)** |
| Child latent class at baseline[3] | | (3.21, 44.39) | | (1.15, 10.17) | | |
| 2 | 11.94*** | (.46, 6.06) | 3.42* | (.65, 3.60) | 4.35*** | (2.21, 8.57) |
| 3 | 1.68 | (6.15, | 1.53 | (4.60, | 1.30 | (.78, 2.15) |
| 4 | 24.32*** | 96.17) | 13.43*** | 39.16) | 5.05** | (1.89, 13.45) |
| Intervention group[4] | | | | | | |
| Brief | 1.79 | (.78, 4.11) | 1.06 | (.49, 2.27) | 1.14 | (.70, 1.88) |
| Enhanced | .75 | (.28, 2.04) | 1.18 | (.57, 2.42) | 1.17 | (.72, 1.90) |
| Female[5] | .41* | (.20, .86) | .55 | (.31, 1.00) | .38*** | (.25, .57) |
| Child age | 1.65* | (1.08, 2.51) | 1.92*** | (1.36, 2.71) | 2.33*** | (1.81, 2.98) |
| Grade[6] | 2.60* | (1.16, 5.85) | 1.62** | (1.14, 2.31) | 1.98*** | (1.55, 2.54) |
| Parent education[7] | | | | | | |
| High school diploma/GED | | | | | | |
| Some college | .72 | (.26, 2.02) | .66 | (.29, 1.48) | .74 | (.42, 1.29) |
| AA/technical degree | .56 | (.17, 1.89) | .79 | (.34, 1.86) | 1.11 | (.63, 1.95) |
| College degree or higher | 1.42 | (.48, 4.19) | 1.23 | (.50, 2.98) | .83 | (.41, 1.66) |
| Monthly family income[8] | 1.79 | (.64, 5.05) | .51 | (.16, 1.61) | .97 | (.49, 1.90) |
| | 2.38 | (.62, 9.09) | 2.72 | (.85, 8.68) | 1.20 | (.54, 2.64) |

| | | | | | | |
|---|---|---|---|---|---|---|
| $500-999 | 2.60 | (.72, 9.33) | 2.08 | (.67, 6.45) | 1.28 | (.66, 2.87) |
| $1000-1999 | 1.91 | (.51, 7.13) | 2.24 | (.74, 6.77) | 1.58 | (.78, 3.22) |
| $2000+ | | | | | | |
| Parent employment[9] | | | | | | |
| Part-time | 1.13 | (.31, 4.20) | 1.30 | (.45, 3.70) | 1.09 | (.50, 2.38) |
| Full-time | 1.54 | (.71, 3.35) | 1.24 | (.65, 2.36) | 1.60* | (1.01, 2.52) |
| Family structure[10] | | | | | | |
| Steady partner | 1.09 | (.35, 3.41) | .69 | (.29, 1.58) | 1.14 | (.64, 2.02) |
| Cohabiting | 1.02 | (.27, 3.86) | .38 | (.11, 1.37) | 1.12 | (.53, 2.38) |
| Married | .82 | (.28, 2.39) | .81 | (.39, 1.68) | 1.27 | (.76, 2.12) |
| Religious attendance[11] | | | | | | |
| Once or twice a month | .95 | (.33, 2.67) | .50 | (.19, 1.35) | 1.10 | (.58, 2.09) |
| Once a week or more | .91 | (.40, 2.07) | .85 | (.43, 1.65) | 1.29 | (.80, 2.09) |
| Does well on schoolwork | .50 | (.24, 1.02) | .49* | (.27, .88) | .62* | (.42, .91) |
| Happy in the past month | .50` | (.22, 1.14) | .79 | (.41, 1.53) | .59* | (.40, .89) |
| Peers who have had sex[12] | | (2.00, 14.95) | | (1.83, 12.14) | | (1.11-64.96) |
| Only a few | 5.47* | (4.86, | 4.71* | (4.08, | 8.48* | (5.06, |
| About half or more | 12.89*** | 34.16) | 10.13*** | 25.13) | 36.75*** | 267.08) |
| Believes parent think s/he should wait to have sex | .49 | (.21, 1.11) | .64 | (.32, 1.29) | .45** | (.28, .71) |
| Parent believes no sex before marriage[13] | | | | | | |
| A little true | .86 | (.27, 2.74) | .86 | (.40, 1.86) | .92 | (.51, 1.67) |
| Very true | 1.69 | (.62, 4.55) | .60 | (.28, 1.28) | 1.02 | (.58, 1.79) |
| Site[14] | | | | | | |
| Atlanta | .44 | (.15, 1.29) | 1.39 | (.62, 3.09) | 1.06 | (.62, 1.82) |
| Little Rock | .99 | (.45, 2.17) | 1.25 | (.60, 2.62) | 1.16 | (.74, 1.84) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Time-varying covariates (i.e. all variables except for baseline latent class, gender, race, parent's education, and site) are matched with each time point. For instance, child's grade level at the one-year follow-up time point is used in that analysis

rather than the child's grade level at baseline.
[2] This is the total sample size for the adjusted analysis, but the exact sample size for the individual variables in the unadjusted analysis may differ.
[3] Class 1 (a healthy and low-risk lifestyle) is the reference category.
[4] General Intervention is the reference category.
[5] Male is the reference category.
[6] 4th grade is the reference category, and 5th grade is the indicator value.
[7] Less than a high school diploma or GED is the reference category.
[8] $0-499 is the reference category.
[9] Other employment status (e.g. student, unemployed) is the reference category.
[10] No steady partner is the reference category.
[11] Never or a few times a year is the reference category.
[12] None is the reference category.
[13] Not at all true is the reference category.
[14] Athens is the reference category.

**Table A.6: Unadjusted Odds Ratios (OR) Using Logistic Regression of Whether Parents Have Had Multiple Sexual Partners in the Past Six Months[1] (Parents Matter! Data, 2001-2006)**

| | **Baseline[2]** (N = 849[3]) | | **1-Year Follow-Up[2]** (N = 685[3]) | | **3-Year Follow-Up[2]** (N = 367[3]) | |
|---|---|---|---|---|---|---|
| **Variable** | **Unadjusted OR** | **(95% CI)** | **Unadjusted OR** | **(95% CI)** | **Unadjusted OR** | **(95% CI)** |
| Parent latent class at baseline[4] | | | | | | |
| 2 | 14.07* | (1.24, 159.90) | 10.07** | (2.08, 48.69) | Empty | Empty |
| 3 | 51.55*** | (7.03, 378.14) | 12.46*** | (3.74, 41.44) | 7.83 | (.98, 62.67) |
| 4 | 5.88 | (.78, 44.62) | 3.54* | (1.06, 11.79) | 2.80 | (.35, 22.61) |
| Intervention group[5] | | | | | | |
| Brief | .77 | (.42, 1.44) | .82 | (.45, 1.52) | .38 | (.12, 1.26) |
| Enhanced | .75 | (.40, 1.39) | .85 | (.47, 1.51) | .41 | (.14, 1.26) |
| Female[6] | .90 | (.21, 3.88) | .72 | (.21, 2.48) | .57 | (.07, 4.49) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Parent age | .94** | (.90, .98) | .96* | (.93, .99) | .92* | (.85, 1.00) |
| Education[7] | | | | | | |
| High school diploma/GED | | | | | | |
| Some college | .49* | (.25, .94) | .60 | (.33, 1.09) | 1.00 | (.31, 3.21) |
| AA/technical degree | .55 | (.27, 1.10) | .40* | (.19, .84) | .18 | (.02, 1.60) |
| College degree or higher | .40 | (.16, 1.01) | .56 | (.25, 1.25) | .66 | (.13, 3.50) |
| Monthly family income[8] | .22* | (.06, .74) | .23** | (.08, .69) | .97 | (.23, 4.17) |
| $500-999 | .65 | (.34, 1.25) | .37** | (.18, .74) | 4.32 | (.52, 35.86) |
| $1000-1999 | .41** | (.22, .79) | .32*** | (.17, .60) | 1.54 | (.17, 14.05) |
| $2000+ | .07*** | (.02, .23) | .19*** | (.10, .39) | 1.51 | (.17, 13.14) |
| Employment[9] | | | | | | |
| Part-time | .75 | (.32, 1.76) | .45 | (.17, 1.19) | 1.52 | (.45, 5.12) |
| Full-time | .54* | (.31, .93) | .44* | (.26, .73) | .28* | (.09, .84) |
| Family structure[10] | | | | | | |
| Steady partner | .64 | (.31, 1.29) | 1.20 | (.66, 2.21) | 2.22 | (.65, 7.52) |
| Cohabiting | .62 | (.26, 1.43) | .63 | (.27, 1.46) | .62 | (.07, 5.67) |
| Married | .19*** | (.09, .44) | .40** | (.20, .79) | .49 | (.11, 2.24) |
| Age of sexual debut[11] | | | | | | |
| 13-15 | .57 | (.24, 1.38) | .43* | (.18, .99) | 1.18 | (.14, 9.66) |
| 16-17 | .29* | (.11, .74) | .24** | (.10, .58) | .46 | (.05, 4.25) |
| 18+ | .33* | (.12, .90) | .16*** | (.06, .44) | .56 | (.06, 5.57) |
| Birth control first sex | .60 | (.33, 1.07) | .44** | (.24, .80) | .57 | (.19, 1.75) |
| Condom use first sex | .53* | (.30, .92) | .52* | (.31, .90) | .98 | (.37, 2.55) |
| Believes it's his/her job to teach child about sex | .83 | (.37, 1.87) | .69 | (.34, 1.42) | .60 | (.17, 2.13) |
| Religious attendance[12] | | | | | | |
| Once or twice a month | 1.75 | (.86, 3.56) | .96 | (.50, 1.83) | .49 | (.10, 2.47) |
| Once a week or more | .89 | (.47, 1.69) | .50* | (.28, .88) | .63 | (.22, 1.79) |
| Believes religion is very important | .54* | (.30, .97) | .55 | (.30, 1.01) | .35 | (.12, 1.02) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Site[13] | | | | | | |
| Atlanta | .82 | (.44, 1.52) | 1.05 | (.56, 1.97) | .63 | (.15, 2.54) |
| Little Rock | .53* | (.28, 1.00) | .81 | (.45, 1.46) | .97 | (.34, 2.76) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Multiple sexual partners is defined as having two or more partners in the past six months.

[2] Time-varying covariates (i.e. all variables except for baseline latent class, gender, race, parent's education, and site) are matched with each time point. For instance, child's grade level at the one-year follow-up time point is used in that analysis rather than the child's grade level at baseline.

[3] This is the total sample size for the adjusted analysis, but the exact sample size for the individual variables in the unadjusted analysis may differ.

[4] Class 1 (a healthy and lower-risk lifestyle) is the reference category.

[5] General Intervention is the reference category.

[6] Male is the reference category.

[7] Less than a high school diploma or GED is the reference category.

[8] $0-499 is the reference category.

[9] Other employment status (e.g. student, unemployed) is the reference category.

[10] No steady partner is the reference category.

[11] Age 12 or younger is the reference category.

[12] Never or a few times a year is the reference category.

[13] Athens is the reference category.

**Table A.7: Unadjusted Odds Ratios (OR) Using Logistic Regression of Whether Parents Have Risky Birth Control Use[1] (Parents Matter! Data, 2001-2006)**

| | **Baseline[2]** (N = 870[3]) | | **1-Year Follow-Up[2]** (N = 691[3]) | | **3-Year Follow-Up[2]** (N = 568[3]) | |
|---|---|---|---|---|---|---|
| **Variable** | **Unadjusted OR** | **(95% CI)** | **Unadjusted OR** | **(95% CI)** | **Unadjusted OR** | **(95% CI)** |
| Parent latent class at baseline[4] | 2.45* | (1.16, 5.19) | 2.83* | (1.13, 1.05) | 1.62 | (.56, 4.66) |
| 2 | 2.49*** | (1.70, 3.65) | 2.33*** | (1.46, 3.73) | 1.86* | (1.13, 3.07) |
| 3 | 1.55** | (1.13, 2.12) | 1.87** | (1.24, 2.81) | 1.94** | (1.26, 3.00) |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | | | | | | |
| Intervention group[5] | | | | | | |
| Brief | .87 | (.65, 1.17) | 1.00 | (.69, 1.45) | .85 | (.57, 1.27) |
| Enhanced | .99 | (.74, 1.33) | 1.21 | (.85, 1.73) | 1.03 | (.70, 1.51) |
| Female[6] | .42* | (.20, .90) | .89 | (.39, 2.01) | .60 | (.25, 1.45) |
| Parent age | .97*** | (.95, .98) | .98 | (.97, 1.00) | .95*** | (.93, .98) |
| Education[7] | | | | | | |
| High school diploma/GED | | | | | | |
| Some college | .63** | (.45, .87) | 1.03 | (.67, 1.54) | 1.78* | (1.13, 2.80) |
| AA/technical degree | .88 | (.62, 1.26) | 1.25 | (.80, 1.94) | 2.16** | (1.33, 3.49) |
| College degree or higher | .56** | (.37, .85) | 1.28 | (.77, 2.12) | 2.22** | (1.26, 3.88) |
| Monthly family income[8] | .54** | (.35, .83) | .88 | (.52, 1.46) | 1.13 | (.64, 2.00) |
| $500-999 | 1.01 | (.69, 1.48) | 1.24 | (.75, 2.04) | 1.02 | (.56, 1.87) |
| $1000-1999 | 1.02 | (.71, 1.45) | 1.15 | (.73, 1.82) | 1.15 | (.66, 2.02) |
| $2000+ | 1.04 | (.73, 1.47) | 1.90** | (1.22, 2.95) | 2.33** | (1.36, 4.02) |
| Employment[9] | | | | | | |
| Part-time | 1.33 | (.88, 2.02) | 1.23 | (.72, 2.12) | .79 | (.43, 1.47) |
| Full-time | 1.13 | (.87, 1.45) | 1.38* | (1.01, 1.89) | 1.73** | (1.22, 2.46) |
| Family structure[10] | | | | | | |
| Steady partner | 1.94** | (1.27, 2.97) | 1.34 | (.86, 2.10) | 1.29 | (.80, 2.07) |
| Cohabiting | 2.93*** | (1.79, 4.80) | 2.35** | (1.40, 3.94) | 2.38** | (1.21, 4.33) |
| Married | 2.75*** | (1.87, 4.06) | 3.13*** | (2.09, 4.69) | 2.75*** | (1.79, 4.20) |
| Age of sexual debut[11] | | | | | | |
| 13-15 | .91 | (.52, 1.59) | 1.01 | (.49, 2.05) | .58 | (.26, 1.28) |
| 16-17 | .73 | (.42, 1.29) | 1.08 | (.53, 2.20) | .58 | (.26, 1.27) |
| 18+ | .79 | (.44, 1.42) | 1.01 | (.48, 2.10) | .73 | (.32, 1.65) |
| Birth control first sex | .83 | (.64, 1.06) | .76 | (.56, 1.04) | .95 | (.68, 1.34) |
| Condom use first sex | .75* | (.59, .95) | .77 | (.57, 1.03) | .95 | (.69, 1.31) |
| Believes it's his/her job to teach child about sex | .74 | (.49, 1.11) | .85 | (.53, 1.36) | 1.03 | (.63, 1.70) |
| Religious attendance[12] | .73 | (.51, 1.05) | .86 | (.55, 1.35) | .71 | (.43, 1.16) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Once or twice a month | .66** | (.50, .88) | 1.36 | (.96, 1.94) | .92 | (.63, 1.34) |
| Once a week or more | | | | | | |
| Believes religion is very important | .72* | (.52, .99) | 1.17 | (.76, 1.78) | .84 | (.53, 1.34) |
| Site[13] | | | | | | |
| Atlanta | .75 | (.55, 1.03) | .52** | (.35, .77) | .64* | (.42, .99) |
| Little Rock | .95 | (.71, 1.26) | .89 | (.62, 1.26) | 1.04 | (.72, 1.50) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] High-risk birth control use refers to individuals who are not using birth control (women aged 50 or older are coded as low-risk, due to menopause). There is information about whether respondents are trying to get pregnant in subsequent time points, but that information was not available at time 1.

[2] Time-varying covariates (i.e. all variables except for baseline latent class, gender, race, parent's education, and site) are matched with each time point. For instance, child's grade level at the one-year follow-up time point is used in that analysis rather than the child's grade level at baseline.

[3] This is the total sample size for the adjusted analysis, but the exact sample size for the individual variables in the unadjusted analysis may differ.

[4] Class 1 (a healthy and lower-risk lifestyle) is the reference category.

[5] General Intervention is the reference category.

[6] Male is the reference category.

[7] Less than a high school diploma or GED is the reference category.

[8] $0-499 is the reference category.

[9] Other employment status (e.g. student, unemployed) is the reference category.

[10] No steady partner is the reference category.

[11] Age 12 or younger is the reference category.

[12] Never or a few times a year is the reference category.

[13] Athens is the reference category.

**Table A.8: Latent Transition Analysis Model Fit Statistics (Parents Matter! Data, 2001-2006)**

| Fit Statistics[1] | 2 Statuses | 3 Statuses | 4 Statuses | 5 Statuses | 6 Statuses |
|---|---|---|---|---|---|
| Child LL[2] | -20431.15 | -19527.09 | -19248.43 | -19026.68 | -18843.53 |
| Parent LL[2] | -18891.56 | -18326.94 | -17893.48 | -17766.24 | -17567.25 |

[1] No additional fit statistics were available due to the number of response items.

[2] Log-likelihood

**Table A.9: Unadjusted Analysis of the Variables and Interactions Associated with Child Membership in Health Lifestyle Statuses[1], Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | Child Status 1 *Healthy and low-risk* | | Child Status 2 *Unhealthy and high-risk* | | Child Status 3 *Unhealthy and low-risk* | | Child Status 4 *Healthy and high-risk* | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Child class at baseline[2] | | | | | | | | |
| 2 | -.55*** | (.03) | .56*** | (.03) | -.07 | (.04) | .07** | (.03) |
| 3 | -.41*** | (.02) | .11*** | (.02) | .37*** | (.02) | -.05** | (.02) |
| 4 | -.55*** | (.04) | .29*** | (.04) | -.14** | (.05) | .40*** | (.04) |
| Intervention group[3] | | | | | | | | |
| Brief | -.01 | (.02) | .01 | (.02) | .01 | (.03) | -.01 | (.02) |
| Enhanced | .01 | (.02) | .00 | (.02) | .02 | (.03 | -.03 | (.02) |
| Site[4] | | | | | | | | |
| Atlanta | .05 | (.03) | .02 | (.02) | -.08** | (.03) | .02 | (.02) |
| Little Rock | -.03 | (.02) | .01 | (.02) | .00 | (.03) | .01 | (.02) |
| Parent class at baseline[5] | -.10 | (.06) | .09 | (.05) | -.02 | (.07) | .03 | (.05) |
| 2 | -.14*** | (.03) | .10*** | (.03) | -.03 | (.03) | .07** | (.02) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 3 | -.07** | (.03) | .04 | (.02) | -.02 | (.03) | .02 | (.02) |
| 4 | | | | | | | | |
| Parent status 2 | -.02 | (.03) | .04 | (.02) | -.02 | (.03) | .00 | (.03) |
| Parent status 3 | -.04* | (.02) | .04* | (.02) | -.01 | (.02) | .03 | (.02) |
| Parent status 4[6] | -.01 | (.02) | .01 | (.02) | .04* | (.02) | -.03* | (.02) |
| Female[7] | .04 | (.02) | -.09*** | (.02) | .15*** | (.02) | -.10*** | (.01) |
| Child age | -.02*** | (.00) | .00 | (.00) | -.02*** | (.00) | .04*** | (.00) |
| Grade[8] | -.02*** | (.00) | .00 | (.00) | -.01** | (.00) | .03*** | (.00) |
| Education[9] | | | | | | | | |
| High school diploma/GED | | | | | | | | |
| Some college | -.03 | (.03) | .02 | (.02) | .08* | (.03) | -.07** | (.02) |
| AA/technical degree | -.01 | (.03) | -.03 | (.03) | .12*** | (.03) | -.08** | (.02) |
| College degree or | -.05 | (.03) | -.01 | (.03) | .12** | (.04) | -.06* | (.03) |
| higher | -.05 | (.03) | -.01 | (.03) | .10* | (.04) | -.04 | (.03) |
| Monthly family income[10] | | | | | | | | |
| $500-999 | .00 | (.02) | .01 | (.01) | -.01 | (.02) | .01 | (.02) |
| $1000-1999 | -.01 | (.02) | -.01 | (.02) | .01 | (.02) | .00 | (.02) |
| $2000+ | -.03 | (.02) | -.03 | (.02) | .04* | (.02) | .01 | (.02) |
| Employment[11] | | | | | | | | |
| Part-time | .00 | (.03) | .02 | (.01) | -.01 | (.02) | -.01 | (.02) |
| Full-time | -.01 | (.01) | -.01 | (.01) | .01 | (.01) | .00 | (.01) |
| Family structure[12] | | | | | | | | |
| Steady partner | .00 | (.02) | .00 | (.01) | .01 | (.02) | -.01 | (.01) |
| Cohabiting | -.01 | (.02) | -.01 | (.02) | .01 | (.02) | .00 | (.02) |
| Married | -.02 | (.02) | .01 | (.02) | .06** | (.02) | -.05** | (.02) |
| Religious attendance[13] | | | | | | | | |
| Once or twice a month | | | | | | | | |
| Once a week or | .02 | (.01) | .02 | (.01) | -.02 | (.02) | -.01 | (.01) |
| more | .01 | (.01) | .00 | (.01) | .00 | (.02) | -.01 | (.01) |
| Does well on schoolwork | .07*** | (.01) | -.05*** | (.01) | -.02 | (.01) | .00 | (.01) |
| Happy in the past month | .03*** | (.01) | -.03*** | (.01) | -.05*** | (.01) | .05*** | (.01) |
| Peers who have had sex[14] | -.06*** | (.01) | .02* | (.01) | -.03** | (.01) | .07*** | (.01) |
| Only a few | -.07*** | (.01) | .02* | (.01) | -.09*** | (.01) | .14*** | (.01) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| About half or more | | | | | | | | |
| Believes parent think s/he should wait to have sex | .08*** | (.01) | -.08*** | (.01) | .03* | (.01) | -.04** | (.01) |
| Parent believes no sex before marriage[15] | | | | | | | | |
| A little true | .01 | (.01) | .00 | (.01) | .01 | (.02) | -.02 | (.01) |
| Very true | .02 | (.02) | .00 | (.01) | .00 | (.02) | -.02 | (.01) |
| Parent participating[16] | .01 | (.01) | -.02** | (.01) | -.06*** | (.01) | .08*** | (.01) |
| Has teen "parent"[17] | .01 | (.02) | .03 | (.02) | -.05 | (.03) | .01 | (.02) |
| Monitoring: C[18, 19] | .07*** | (.01) | -.06*** | (.01) | .01 | (.01) | -.01 | (.01) |
| Monitoring: P[20] | .02* | (.01) | -.03** | (.01) | .04*** | (.01) | -.04*** | (.01) |
| Quality: C[21] | .15*** | (.01) | -.13*** | (.01) | .01 | (.02) | -.04** | (.01) |
| Quality: P | .07*** | (.02) | -.08*** | (.02) | .03 | (.02) | -.03 | (.02) |
| Communication: C[22] | .08*** | (.01) | -.06*** | (.01) | -.08*** | (.01) | .05*** | (.01) |
| Communication: P | .01 | (.01) | -.03** | (.01) | -.04** | (.01) | .06*** | (.01) |
| Responsiveness: C[23] | .08*** | (.02) | -.09*** | (.01) | -.05** | (.02) | .06*** | (.01) |
| Responsiveness: P | .01 | (.02) | -.07*** | (.02) | -.04 | (.02) | .08*** | (.02) |
| Parent status 2 x Intervention | | | | | | | | |
| Brief | -.05 | (.07) | .01 | (.06) | -.01 | (.08) | .05 | (.06) |
| Enhanced | .00 | (.07) | -.05 | (.06) | -.06 | (.08) | .10 | (.06) |
| Parent status 3 x Intervention | | | | | | | | |
| Brief | .04 | (.05) | -.03 | (.04) | -.02 | (.05) | -.01 | (.04) |
| Enhanced | .03 | (.05) | -.03 | (.04) | .09 | (.05) | -.09* | (.04) |
| Parent status 4 x Intervention | | | | | | | | |
| Brief | -.04 | (.05) | .03 | (.04) | .00 | (.05) | .03 | (.04) |
| Enhanced | -.04 | (.05) | -.02 | (.04) | .03 | (.05) | .04 | (.04) |
| Monitoring: C x Intervention | .03 | (.02) | | | .00 | (.02) | -.02 | (.02) |
| Brief | .00 | (.02) | .00 | (.01) | -.01 | (.02) | .00 | (.01) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Enhanced | | | .00 | (.01) | | | | |
| Monitoring: P x Intervention | | | | | | | | |
| Brief | .03 | (.03) | .01 | (.02) | -.02 | (.03) | -.02 | (.02) |
| Enhanced | .00 | (.03) | .00 | (.02) | -.04 | (.03) | .04 | (.02) |
| Quality: C x Intervention | | | | | | | | |
| Brief | .05 | (.04) | .05 | (.03) | -.02 | (.04) | -.06 | (.03) |
| Enhanced | -.03 | (.04) | .08* | (.03) | -.01 | (.04) | -.04 | (.03) |
| Quality: P x Intervention | | | | | | | | |
| Brief | -.02 | (.05) | .00 | (.04) | .01 | (.06) | .01 | (.04) |
| Enhanced | -.01 | (.05) | .11** | (.04) | -.09 | (.06) | -.01 | (.04) |
| Communication: C x Intervention | | | | | | | | |
| Brief | .07* | (.03) | .00 | (.02) | -.07* | (.03) | .00 | (.02) |
| Enhanced | .08** | (.03) | .00 | (.02) | -.08* | (.03) | .00 | (.02) |
| Communication: P x Intervention | | | | | | | | |
| Brief | -.02 | (.03) | -.02 | (.03) | -.01 | (.04) | .04 | (.03) |
| Enhanced | .01 | (.03) | -.04 | (.03) | -.03 | (.03) | .06* | (.03) |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | -.05 | (.04) | .09* | (.04) | .01 | (.05) | -.05 | (.04) |
| Enhanced | .02 | (.04) | .06 | (.03) | -.04 | (.04) | -.04 | (.04) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | .02 | (.05) | -.02 | (.04) | -.01 | (.06) | .00 | (.04) |
| Enhanced | .08 | (.05) | .02 | (.04) | -.12* | (.06) | .02 | (.04) |
| Constant | | | | | | | | |
| Observations | | | | | | | | |
| Groups | | | | | | | | |
| Log-likelihood | | | | | | | | |

Sigma_u
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Rho

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* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Children's health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex.

[2] Children's best fitting class at baseline was determine using latent class analysis on the behaviors listed in Footnote 1. Class 1 is the reference category.

[3] The General Intervention is the reference category.

[4] Athens is the reference category.

[5] Parents' best fitting class at baseline was determined using latent class analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events. Class 1 is the reference category.

[6] Parents' health lifestyle statuses were determined using latent transition analysis on the behaviors listed in Footnote 5. Parent status 1 is the reference category. Parent status 1 = Healthy, lower sexual risk, moderate stress. Parent status 2 = Somewhat healthy, high sexual risk, some stress. Parent status 3 = Unhealthy, some sexual risk, high stress. Parent status 4 = Unhealthy, lower sexual risk, low stress.

[7] Male is the reference category.

[8] $4^{th}$ grade is the reference category at baseline, and $5^{th}$ grade is the indicator value.

[9] Less than a high school diploma or GED is the reference category.

[10] $0-499 is the reference category.

[11] Other employment status (e.g. student, unemployed) is the reference category.

[12] No steady partner is the reference category.

[13] Never or a few times a year is the reference category.

[14] None is the reference category.

[15] Not at all true is the reference category.

[16] "Parent" includes biological, adoptive, and step-parents.

[17] The parent or guardian participating in the program, not necessarily the child's biological parent, was a teen parent.

[18] "C" stands for the parenting practice from the child's perspective.

[19] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.

[20] "P" stands for the parenting practice from the parent's perspective.
[21] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.
[22] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.
[23] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

**Table A.10: Unadjusted Analysis of the Variables and Interactions Associated with Parent Membership in Health Lifestyle Statuses[1], Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | **Parent Status 1** *Healthy, lower sexual risk, moderate stress* | | **Parent Status 2** *Somewhat healthy, high sexual risk, some stress* | | **Parent Status 3** *Unhealthy, some sexual risk, high stress* | | **Parent Status 4** *Unhealthy, lower sexual risk, low stress* | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Parent class at baseline[2] | | | | | | | | |
| 2 | -.60*** | (.05) | .49*** | (.02) | .11 | (.06) | -.06 | (.06) |
| 3 | -.70*** | (.03) | .01 | (.01) | .69*** | (.03) | .00 | (.03) |
| 4 | -.68*** | (.02) | .01 | (.01) | .21*** | (.02) | .46*** | (.02) |
| Intervention group[3] | | | | | | | | |
| Brief | .02 | (.03) | .00 | (.01) | -.02 | (.03) | -.01 | (.03) |
| Enhanced | -.03 | (.03) | -.01 | (.01) | -.02 | (.03) | .06* | (.03) |
| Site[4] | | | | | | | | |
| Atlanta | .05 | (.03) | .01 | (.01) | -.04 | (.03) | -.02 | (.03) |
| Little Rock | .00 | (.03) | .01 | (.01) | .00 | (.03) | -.01 | (.03) |
| Child class at baseline[5] | -.08 | (.04) | .00 | (.02) | .06 | (.04) | .02 | (.05) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2 | -.06* | (.03) | .01 | (.01) | -.01 | (.03) | .05* | (.03) |
| 3 | -.25*** | (.06) | .03 | (.02) | .01 | (.06) | .22** | (.06) |
| 4 | | | | | | | | |
| Child status 2[6] | -.05*** | (.01) | .02 | (.01) | .02 | (.01) | .01 | (.01) |
| Child status 3 | -.01 | (.01) | -.01 | (.01) | .00 | (.01) | .02 | (.01) |
| Child status 4 | .03* | (.01) | .00 | (.01) | .00 | (.01) | -.02 | (.01) |
| Female[7] | -.06 | (.07) | -.01 | (.02) | .14* | (.07) | -.07 | (.07) |
| Parent age | .01*** | (.00) | .00** | (.00) | -.01*** | (.00) | .00 | (.00) |
| Education[8] | | | | | | | | |
| High school diploma/GED | | | | | | | | |
| Some college | .00 | (.03) | -.02 | (.01) | -.10** | (.03) | .12*** | (.03) |
| AA/technical degree | .04 | (.03) | -.01 | (.01) | -.19*** | (.03) | .16*** | (.03) |
| College degree or | .08* | (.04) | -.02 | (.01) | -.19*** | (.04) | .12** | (.04) |
| higher | .15*** | (.04) | -.01 | (.01) | -.26*** | (.04) | .13** | (.04) |
| Monthly family income[9] | | | | | | | | |
| $500-999 | .00 | (.01) | .00 | (.01) | -.01 | (.01) | .01 | (.01) |
| $1000-1999 | .01 | (.01) | .00 | (.01) | -.04** | (.01) | .02 | (.01) |
| $2000+ | .03* | (.01) | .00 | (.01) | -.06*** | (.01) | .02 | (.01) |
| Employment[10] | | | | | | | | |
| Part-time | -.02 | (.01) | .02 | (.01) | -.03* | (.01) | .02* | (.01) |
| Full-time | .00 | (.01) | .00 | (.01) | -.04*** | (.01) | .03** | (.01) |
| Family structure[11] | | | | | | | | |
| Steady partner | -.01 | (.01) | .00 | (.01) | .00 | (.01) | -.02 | (.01) |
| Cohabiting | -.03* | (.01) | .01 | (.01) | -.01 | (.01) | .02 | (.01) |
| Married | -.03* | (.01) | .01 | (.01) | -.01 | (.01) | .03 | (.01) |
| Age of sexual debut[12] | | | | | | | | |
| 13-15 | -.04 | (.05) | -.02 | (.02) | .01 | (.05) | .06 | (.05) |
| 16-17 | -.02 | (.05) | -.03 | (.02) | -.06 | (.05) | .12* | (.05) |
| 18+ | .04 | (.06) | -.02 | (.02) | -.10 | (.06) | .08 | (.06) |
| Birth control first sex | .07** | (.02) | -.01 | (.01) | -.09*** | (.02) | .04 | (.02) |
| Condom use first sex | .08** | (.02) | -.01 | (.01) | -.08*** | (.02) | .02 | (.02) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Believes it's his/her job to teach child about sex | .02 | (.01) | -.05*** | (.01) | .00 | (.01) | .02 | (.01) |
| Religious attendance[13] | | | | | | | | |
| Once or twice a month | | | | | | | | |
| Once a week or more | -.01 | (.01) | .00 | (.01) | .00 | (.01) | .01 | (.01) |
| | .00 | (.01) | .00 | (.01) | -.02 | (.01) | .01 | (.01) |
| Believes religion is very important | .03* | (.01) | -.01 | (.01) | -.02 | (.01) | .00 | (.01) |
| Child's parent[14] | .05*** | (.01) | .00 | (.00) | -.02*** | (.01) | -.04*** | (.01) |
| Was a teen parent | -.01 | (.03) | .00 | (.01) | .06* | (.03) | -.05* | (.03) |
| Monitoring: C[15, 16] | .00 | (.00) | .00 | (.00) | .00 | (.00) | .00 | (.00) |
| Monitoring: P[17] | .02* | (.01) | -.02*** | (.01) | -.01 | (.01) | .01 | (.01) |
| Quality: C[18] | -.02* | (.01) | -.01 | (.01) | .00 | (.01) | .04*** | (.01) |
| Quality: P | .07*** | (.02) | -.05*** | (.01) | -.10*** | (.02) | .08*** | (.02) |
| Communication: C[19] | .03*** | (.01) | .01 | (.01) | -.01 | (.01) | -.03*** | (.01) |
| Communication: P | .08*** | (.01) | -.01* | (.01) | -.04*** | (.01) | -.04*** | (.01) |
| Responsiveness: C[20] | .02* | (.01) | .00 | (.01) | -.02 | (.01) | .00 | (.01) |
| Responsiveness: P | .10*** | (.01) | -.06*** | (.01) | -.04** | (.01) | .00 | (.01) |
| Child status 2 x Intervention | | | | | | | | |
| Brief | .00 | (.03) | .02 | (.02) | -.02 | (.03) | .03 | (.03) |
| Enhanced | .02 | (.03) | -.01 | (.02) | .01 | (.03) | -.01 | (.03) |
| Child status 3 x Intervention | | | | | | | | |
| Brief | .02 | (.03) | -.01 | (.02) | -.02 | (.03) | -.01 | (.03) |
| Enhanced | -.02 | (.02) | -.02 | (.02) | .03 | (.02) | .00 | (.03) |
| Child status 4 x Intervention | | | | | | | | |
| Brief | -.01 | (.03) | .02 | (.02) | .02 | (.03) | -.03 | (.03) |
| Enhanced | .00 | (.03) | .04 | (.02) | -.04 | (.03) | .00 | (.03) |
| Monitoring: C x Intervention | -.02 | (.01) | -.02 | (.01) | .01 | (.01) | | |
| | | (.01) | .00 | (.01) | .00 | (.01) | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Brief | -.01 | | | | | | .02 | (.01) |
| Enhanced | | | | | | | .01 | (.01) |
| Monitoring: P x Intervention | | | | | | | | |
| Brief | .00 | (.02) | .01 | (.01) | -.01 | (.02) | -.01 | (.02) |
| Enhanced | .00 | (.02) | .01 | (.01) | -.03 | (.02) | .01 | (.02) |
| Quality: C x Intervention | | | | | | | | |
| Brief | -.06* | (.03) | -.01 | (.02) | .01 | (.03) | .05 | (.03) |
| Enhanced | -.06* | (.03) | -.01 | (.02) | .03 | (.02) | .06* | (.03) |
| Quality: P x Intervention | | | | | | | | |
| Brief | .00 | (.04) | -.03 | (.03) | .11** | (.04) | -.12** | (.04) |
| Enhanced | .02 | (.04) | .00 | (.03) | -.04 | (.04) | .01 | (.04) |
| Communication: C x Intervention | | | | | | | | |
| Brief | -.03 | (.02) | .01 | (.02) | .01 | (.02) | -.01 | (.02) |
| Enhanced | -.03 | (.02) | .00 | (.01) | .03 | (.02) | .00 | (.02) |
| Communication: P x Intervention | | | | | | | | |
| Brief | -.02 | (.02) | .00 | (.02) | .00 | (.02) | .01 | (.02) |
| Enhanced | .03 | (.02) | -.01 | (.02) | -.02 | (.02) | .00 | (.02) |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | -.01 | (.03) | -.01 | (.02) | -.03 | (.03) | .03 | (.03) |
| Enhanced | .01 | (.03) | .00 | (.02) | -.02 | (.03) | -.01 | (.03) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | -.09* | (.04) | -.01 | (.03) | .10** | (.04) | -.01 | (.04) |
| Enhanced | .03 | (.04) | -.04 | (.03) | .00 | (.04) | -.01 | (.04) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least

20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[2] Parents' best fitting class at baseline was determined using latent class analysis on the behaviors listed in Footnote 1. Class 1 is the reference category and the class titles are the same as the status titles.

[3] The General Intervention is the reference category.

[4] Athens is the reference category.

[5] Children's best fitting class at baseline was determined using latent class analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex. Class 1 is the reference category. Child class 1 = Healthy and low-risk. Child class 2 = Unhealthy and high-risk. Child class 3 = Unhealthy and low-risk. Child class 4 = Healthy and high-risk.

[6] Children's health lifestyle statuses were determined using latent transition analysis on the behaviors listed in Footnote 5. Child status 1 is the reference category. The class titles are the same as the status titles.

[7] Male is the reference category.

[8] Less than a high school diploma or GED is the reference category.

[9] $0-499 is the reference category.

[10] Other employment status (e.g. student, unemployed) is the reference category.

[11] No steady partner is the reference category.

[12] Age 12 or younger is the reference category.

[13] Never or a few times a year is the reference category.

[14] "Parent" includes biological, adoptive, and step-parents.

[15] "C" stands for the parenting practice from the child's perspective.

[16] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.

[17] "P" stands for the parenting practice from the parent's perspective.

[18] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.

[19] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.

[20] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

**Table A.11: Variables Associated with Probability of Child Membership in Health Lifestyle Status[1] 1 (Healthy and Low-Risk), Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | Model 1: Unadjusted | | Model 2: Q5 | | Model 3: Q6 | | Model 4: Q9 | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Child class at baseline[2] | | | | | | | | |
| 2 | -.55*** | (.03) | | | | | | |
| 3 | -.41*** | (.02) | | | | | | |
| 4 | -.55*** | (.04) | | | | | | |
| Intervention group[3] | | | | | | | | |
| Brief | -.01 | (.02) | -.02 | (.02) | -.01 | (.02) | -.24 | (.21) |
| Enhanced | .01 | (.02) | .01 | (.02) | .03 | (.02) | -.10 | (.21) |
| Site[4] | | | | | | | | |
| Atlanta | .05 | (.03) | .05 | (.03) | .04 | (.03) | .04 | (.03) |
| Little Rock | -.03 | (.02) | -.03 | (.02) | -.03 | (.02) | -.03 | (.02) |
| Parent class at baseline[5] | | | | | | | | |
| 2 | -.10 | (.06) | | | | | | |
| 3 | -.14*** | (.03) | | | | | | |
| 4 | -.07** | (.03) | | | | | | |
| Parent status 2[6] | -.02 | (.03) | -.07* | (.03) | -.08* | (.03) | -.10 | (.06) |
| Parent status 3 | -.04* | (.02) | -.08** | (.02) | -.07** | (.02) | -.08 | (.04) |
| Parent status 4 | -.01 | (.02) | -.05* | (.02) | -.08** | (.02) | -.04 | (.04) |
| Female[7] | .04 | (.02) | | | .01 | (.02) | .02 | (.02) |
| Child age | -.02*** | (.00) | | | -.01 | (.01) | -.01 | (.01) |
| Grade[8] | -.02*** | (.00) | | | -.01 | (.01) | -.01 | (.01) |
| Education[9] | -.03 | (.03) | | | .00 | (.03) | .00 | (.03) |
| High school diploma/GED | -.01 | (.03) | | | .03 | (.03) | .03 | (.03) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Some college | -.05 | (.03) | | -.02 | (.04) | -.03 | (.04) |
| AA/technical degree | -.05 | (.03) | | -.03 | (.04) | -.02 | (.04) |
| College degree or higher | | | | | | | |
| Monthly family income[10] | | | | | | | |
| $500-999 | .00 | (.02) | | .01 | (.02) | .01 | (.02) |
| $1000-1999 | -.01 | (.02) | | .01 | (.02) | .01 | (.02) |
| $2000+ | -.03 | (.02) | | -.01 | (.02) | -.01 | (.02) |
| Employment[11] | | | | | | | |
| Part-time | .00 | (.03) | | .00 | (.02) | .00 | (.02) |
| Full-time | -.01 | (.01) | | .00 | (.02) | .00 | (.01) |
| Family structure[12] | | | | | | | |
| Steady partner | .00 | (.02) | | .01 | (.02) | .01 | (.02) |
| Cohabiting | -.01 | (.02) | | -.01 | (.02) | -.01 | (.02) |
| Married | -.02 | (.02) | | -.01 | (.02) | .00 | (.02) |
| Religious attendance[13] | | | | | | | |
| Once or twice a month | | | | | | | |
| Once a week or more | .02 | (.01) | | .01 | (.02) | .01 | (.02) |
| | .01 | (.01) | | .01 | (.02) | .01 | (.02) |
| Does well on schoolwork | .07*** | (.01) | | .05*** | (.01) | .05*** | (.01) |
| Happy in the past month | .03*** | (.01) | | .02* | (.01) | .03* | (.01) |
| Peers who have had sex[14] | | | | | | | |
| Only a few | -.06*** | (.01) | | -.05*** | (.01) | -.04*** | (.01) |
| About half or more | -.07*** | (.01) | | -.03* | (.01) | -.03* | .01) |
| Believes parent think s/he should wait to have sex | .08*** | (.01) | | .06*** | (.01) | .06*** | (.01) |
| Parent believes no sex before marriage[15] | | | | | | | |
| A little true | .01 | (.01) | | .02 | (.01) | .02 | (.01) |
| Very true | .02 | (.02) | | .03 | (.02) | .03 | (.02) |
| Parent participating[16] | .01 | (.01) | | .03* | (.02) | .03* | (.02) |
| Has teen “parent”[17] | .01 | (.02) | | .00 | (.02) | .00 | (.02) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Monitoring: C[18, 19] | .07*** | (.01) | .04*** | (.01) | .03* | (.01) |
| Monitoring: P[20] | .02* | (.01) | .00 | (.01) | -.01 | (.02) |
| Quality: C[21] | .15*** | (.01) | .06** | (.02) | .04 | (.03) |
| Quality: P | .07*** | (.02) | .01 | (.02) | .02 | (.05) |
| Communication: C[22] | .08*** | (.01) | .05*** | (.01) | .00 | (.02) |
| Communication: P | .01 | (.01) | -.01 | (.02) | -.01 | (.03) |
| Responsiveness: C[23] | .08*** | (.02) | .02 | (.02) | .08* | (.04) |
| Responsiveness: P | .01 | (.02) | -.02 | (.03) | -.03 | (.05) |
| Parent status 2 x Intervention | | | | | | |
| Brief | -.05 | (.07) | | | -.02 | (.08) |
| Enhanced | .00 | (.07) | | | .06 | (.08) |
| Parent status 3 x Intervention | | | | | | |
| Brief | .04 | (.05) | | | .03 | (.06) |
| Enhanced | .03 | (.05) | | | -.01 | (.06) |
| Parent status 4 x Intervention | | | | | | |
| Brief | -.04 | (.05) | | | -.04 | (.06) |
| Enhanced | -.04 | (.05) | | | -.06 | (.06) |
| Monitoring: C x Intervention | | | | | | |
| Brief | .03 | (.02) | | | .02 | (.02) |
| Enhanced | .00 | (.02) | | | -.01 | (.02) |
| Monitoring: P x Intervention | | | | | | |
| Brief | .03 | (.03) | | | .03 | (.03) |
| Enhanced | .00 | (.03) | | | .00 | (.03) |
| Quality: C x Intervention | | | | | | |
| Brief | .05 | (.04) | | | .06 | (.04) |
| Enhanced | -.03 | (.04) | | | -.01 | (.04) |
| Quality: P x | -.02 | (.05) | | | -.01 | (.06) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Intervention | -.01 | (.05) | | | | | -.01 | (.06) |
| Brief | | | | | | | | |
| Enhanced | | | | | | | | |
| Communication: C x Intervention | | | | | | | | |
| Brief | .07* | (.03) | | | | | .06 | (.03) |
| Enhanced | .08** | (.03) | | | | | .08* | (.03) |
| Communication: P x Intervention | | | | | | | | |
| Brief | -.02 | (.03) | | | | | .01 | (.04) |
| Enhanced | .01 | (.03) | | | | | -.01 | (.04) |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | -.05 | (.04) | | | | | -.12* | (.05) |
| Enhanced | .02 | (.04) | | | | | -.06 | (.05) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | .02 | (.05) | | | | | -.01 | (.06) |
| Enhanced | .08 | (.05) | | | | | .05 | (.06) |
| Constant | | | .31*** | (.03) | -.13 | (.12) | -.02 | (.18) |
| Observations | | | 3956 | | 3477 | | 3477 | |
| Groups | | | 1104 | | 1001 | | 1001 | |
| Log-likelihood | | | -820.42 | | -621.76 | | -609.02 | |
| Sigma_u | | | .29 | (.01) | .27 | (.01) | .27 | (.01) |
| Sigma_e | | | .23 | (.00) | .23 | (.00) | .23 | (.00) |
| Rho | | | .61 | (.01) | .58 | (.02) | .58 | (.02) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Children's health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex.

[2] Children's best fitting class at baseline was determined using latent class analysis on the behaviors listed in Footnote 1. Class 1 is the reference category.

[3] The General Intervention is the reference category.
[4] Athens is the reference category.
[5] Parents' best fitting class at baseline was determined using latent class analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events. Class 1 is the reference category.
[6] Parents' health lifestyle statuses were determined using latent transition analysis on the behaviors listed in Footnote 5. Parent status 1 is the reference category. Parent status 1 = Healthy, lower sexual risk, moderate stress. Parent status 2 = Somewhat healthy, high sexual risk, some stress. Parent status 3 = Unhealthy, some sexual risk, high stress. Parent status 4 = Unhealthy, lower sexual risk, low stress.
[7] Male is the reference category.
[8] 4$^{th}$ grade is the reference category at baseline, and 5$^{th}$ grade is the indicator value.
[9] Less than a high school diploma or GED is the reference category.
[10] $0-499 is the reference category.
[11] Other employment status (e.g. student, unemployed) is the reference category.
[12] No steady partner is the reference category.
[13] Never or a few times a year is the reference category.
[14] None is the reference category.
[15] Not at all true is the reference category.
[16] "Parent" includes biological, adoptive, and step-parents.
[17] The parent or guardian participating in the program, not necessarily the child's biological parent, was a teen parent.
[18] "C" stands for the parenting practice from the child's perspective.
[19] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.
[20] "P" stands for the parenting practice from the parent's perspective.
[21] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.
[22] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.
[23] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

**Table A.12: Variables Associated with Probability of Child Membership in Health Lifestyle Status[1] 2 (Unhealthy and High-Risk), Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | Model 1: Unadjusted | | Model 2: Q5 | | Model 3: Q6 | | Model 4: Q9 | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Child class at baseline[2] | | | | | | | | |
| 2 | .56*** | (.03) | | | | | | |
| 3 | .11*** | (.02) | | | | | | |
| 4 | .29*** | (.04) | | | | | | |
| Intervention group[3] | | | | | | | | |
| Brief | .01 | (.02) | .02 | (.02) | .01 | (.02) | -.17 | (.18) |
| Enhanced | .00 | (.02) | .00 | (.02) | .00 | (.02) | -.27 | (.18) |
| Site[4] | | | | | | | | |
| Atlanta | .02 | (.02) | .02 | (.02) | .01 | (.02) | .01 | (.02) |
| Little Rock | .01 | (.02) | .01 | (.02) | .01 | (.02) | .00 | (.02) |
| Parent class at baseline[5] | | | | | | | | |
| 2 | .09 | (.05) | | | | | | |
| 3 | .10*** | (.03) | | | | | | |
| 4 | .04 | (.02) | | | | | | |
| Parent status 2[6] | .04 | (.02) | .09** | (.03) | .07* | (.03) | .11* | (.05) |
| Parent status 3 | .04* | (.02) | .08*** | (.02) | .04 | (.02) | .04 | (.04) |
| Parent status 4 | .01 | (.02) | .05* | (.02) | .05* | (.02) | .05 | (.04) |
| Female[7] | -.09*** | (.02) | | | -.08*** | (.02) | -.08*** | (.02) |
| Child age | .00 | (.00) | | | .00 | (.01) | .00 | (.01) |
| Grade[8] | .00 | (.00) | | | -.01 | (.01) | -.01 | (.01) |
| Education[9] | | | | | | | | |
| High school diploma/GED | .02 | (.02) | | | .02 | (.02) | .02 | (.02) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Some college | -.03 | (.03) | | -.02 | (.03) | -.02 | (.03) |
| AA/technical degree | -.01 | (.03) | | .00 | (.03) | .00 | (.03) |
| College degree or higher | -.01 | (.03) | | .02 | (.03) | .02 | (.03) |
| Monthly family income[10] | | | | | | | |
| $500-999 | .01 | (.01) | | .00 | (.02) | .01 | (.02) |
| $1000-1999 | -.01 | (.02) | | .00 | (.02) | -.01 | (.02) |
| $2000+ | -.03 | (.02) | | -.02 | (.02) | .02 | (.02) |
| Employment[11] | | | | | | | |
| Part-time | .02 | (.01) | | .02 | (.02) | .03 | (.02) |
| Full-time | -.01 | (.01) | | .00 | (.01) | .01 | (.01) |
| Family structure[12] | | | | | | | |
| Steady partner | .00 | (.01) | | -.01 | (.01) | -.01 | (.01) |
| Cohabiting | -.01 | (.02) | | -.01 | (.02) | -.02 | (.02) |
| Married | .01 | (.02) | | .01 | (.02) | .00 | (.02) |
| Religious attendance[13] | | | | | | | |
| Once or twice a month | | | | | | | |
| Once a week or more | .02 | (.01) | | .02 | (.01) | .02 | (.01) |
| | .00 | (.01) | | .01 | (.01) | .01 | (.01) |
| Does well on schoolwork | -.05*** | (.01) | | -.03** | (.01) | -.03** | (.01) |
| Happy in the past month | -.03*** | (.01) | | -.01 | (.01) | -.02 | (.01) |
| Peers who have had sex[14] | | | | | | | |
| Only a few | .02* | (.01) | | .03** | (.01) | .03** | (.01) |
| About half or more | .02* | (.01) | | .03* | (.01) | .03* | (.01) |
| Believes parent think s/he should wait to have sex | -.08*** | (.01) | | -.06*** | (.01) | -.06*** | (.01) |
| Parent believes no sex before marriage[15] | | | | | | | |
| A little true | .00 | (.01) | | .00 | (.01) | .00 | (.12) |
| Very true | .00 | (.01) | | .00 | (.01) | .00 | (.01) |
| Parent participating[16] | -.02** | (.01) | | -.01 | (.01) | -.01 | (.01) |
| Has teen "parent"[17] | .03 | (.02) | | .03 | (.02) | .03 | (.02) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Monitoring: C[18, 19] | -.06*** | (.01) | | -.04*** | (.01) | -.03** | (.01) |
| Monitoring: P[20] | -.03** | (.01) | | -.01 | (.01) | .00 | (.02) |
| Quality: C[21] | -.13*** | (.01) | | -.07*** | (.02) | -.10*** | (.03) |
| Quality: P | -.08*** | (.02) | | -.03 | (.02) | -.08* | (.04) |
| Communication: C[22] | -.06*** | (.01) | | -.02 | (.01) | -.01 | (.02) |
| Communication: P | -.03** | (.01) | | .01 | (.01) | .04 | (.03) |
| Responsiveness: C[23] | -.09*** | (.01) | | -.03 | (.02) | -.09** | (.03) |
| Responsiveness: P | -.07*** | (.02) | | -.02 | (.02) | -.02 | (.04) |
| Parent status 2 x Intervention | | | | | | | |
| Brief | .01 | (.06) | | | | .01 | (.05) |
| Enhanced | -.05 | (.06) | | | | -.02 | (.05) |
| Parent status 3 x Intervention | | | | | | | |
| Brief | -.03 | (.04) | | | | .02 | (.02) |
| Enhanced | -.03 | (.04) | | | | -.01 | (.02) |
| Parent status 4 x Intervention | | | | | | | |
| Brief | .03 | (.04) | | | | .05 | (.05) |
| Enhanced | -.02 | (.04) | | | | -.05 | (.05) |
| Monitoring: C x Intervention | | | | | | | |
| Brief | .00 | (.01) | | | | -.02 | (.02) |
| Enhanced | .00 | (.01) | | | | -.01 | (.02) |
| Monitoring: P x Intervention | | | | | | | |
| Brief | .01 | (.02) | | | | .02 | (.02) |
| Enhanced | .00 | (.02) | | | | -.02 | (.02) |
| Quality: C x Intervention | | | | | | | |
| Brief | .05 | (.03) | | | | .03 | (.04) |
| Enhanced | .08* | (.03) | | | | .05 | (.04) |
| Quality: P x | .00 | (.04) | | | | .02 | (.05) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Intervention | .11** | (.04) | | | | | .13* | (.05) |
| Brief | | | | | | | | |
| Enhanced | | | | | | | | |
| Communication: C x Intervention | | | | | | | | |
| Brief | .00 | (.02) | | | | | -.02 | (.03) |
| Enhanced | .00 | (.02) | | | | | .00 | (.03) |
| Communication: P x Intervention | | | | | | | | |
| Brief | -.02 | (.03) | | | | | -.01 | (.03) |
| Enhanced | -.04 | (.03) | | | | | -.07* | (.03) |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | .09* | (.04) | | | | | .11** | (.04) |
| Enhanced | .06 | (.03) | | | | | .06 | (.04) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | -.02 | (.04) | | | | | -.03 | (.05) |
| Enhanced | .02 | (.04) | | | | | .01 | (.05) |
| Constant | | | .13*** | (.02) | .79*** | (.10) | .98*** | (.15) |
| Observations | | | 3956 | | 3477 | | 3477 | |
| Groups | | | 1104 | | 1001 | | 1001 | |
| Log-likelihood | | | -202.90 | | -64.44 | | -46.38 | |
| Sigma_u | | | .26 | (.01) | .24 | (.01) | .24 | (.01) |
| Sigma_e | | | .20 | (.00) | .19 | (.00) | .19 | (.00) |
| Rho | | | .65 | (.01) | .61 | (.02) | .61 | (.02) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Children's health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex.

[2] Children's best fitting class at baseline was determined using latent class analysis on the behaviors listed in Footnote 1. Class 1 is the reference category.

[3] The General Intervention is the reference category.
[4] Athens is the reference category.
[5] Parents' best fitting class at baseline was determined using latent class analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events. Class 1 is the reference category.
[6] Parents' health lifestyle statuses were determined using latent transition analysis on the behaviors listed in Footnote 5. Parent status 1 is the reference category. Parent status 1 = Healthy, lower sexual risk, moderate stress. Parent status 2 = Somewhat healthy, high sexual risk, some stress. Parent status 3 = Unhealthy, some sexual risk, high stress. Parent status 4 = Unhealthy, lower sexual risk, low stress.
[7] Male is the reference category.
[8] 4$^{th}$ grade is the reference category at baseline, and 5$^{th}$ grade is the indicator value.
[9] Less than a high school diploma or GED is the reference category.
[10] $0-499 is the reference category.
[11] Other employment status (e.g. student, unemployed) is the reference category.
[12] No steady partner is the reference category.
[13] Never or a few times a year is the reference category.
[14] None is the reference category.
[15] Not at all true is the reference category.
[16] "Parent" includes biological, adoptive, and step-parents.
[17] The parent or guardian participating in the program, not necessarily the child's biological parent, was a teen parent.
[18] "C" stands for the parenting practice from the child's perspective.
[19] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.
[20] "P" stands for the parenting practice from the parent's perspective.
[21] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.
[22] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.
[23] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

**Table A.13: Variables Associated with Probability of Child Membership in Health Lifestyle Status[1] 3 (Unhealthy and Low-Risk), Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | Model 1: Unadjusted | | Model 2: Q5 | | Model 3: Q6 | | Model 4: Q9 | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Child class at baseline[2] | | | | | | | | |
| 2 | -.07 | (.04) | | | | | | |
| 3 | .37*** | (.02) | | | | | | |
| 4 | -.14** | (.05) | | | | | | |
| Intervention group[3] | | | | | | | | |
| Brief | .01 | (.03) | .01 | (.03) | .02 | (.03) | .27 | (.27) |
| Enhanced | .02 | (.03 | .02 | (.03) | .02 | (.03) | .48* | (.48) |
| Site[4] | | | | | | | | |
| Atlanta | -.08** | (.03) | -.08** | (.03) | -.06 | (.03) | -.06 | (.03) |
| Little Rock | .00 | (.03) | .01 | (.03) | .01 | (.03) | .01 | (.03) |
| Parent class at baseline[5] | | | | | | | | |
| 2 | -.02 | (.07) | | | | | | |
| 3 | -.03 | (.03) | | | | | | |
| 4 | -.02 | (.03) | | | | | | |
| Parent status 2[6] | -.02 | (.03) | -.01 | (.04) | .01 | (.04) | .04 | (.07) |
| Parent status 3 | -.01 | (.02) | .00 | (.03) | .00 | (.03) | -.03 | (.05) |
| Parent status 4 | .04* | (.02) | .04 | (.02) | .02 | (.03) | .00 | (.05) |
| Female[7] | .15*** | (.02) | | | .17*** | (.02) | .17*** | (.02) |
| Child age | -.02*** | (.00) | | | -.01 | (.01) | -.01 | (.01) |
| Grade[8] | -.01** | (.00) | | | .03*** | (.01) | .03*** | (.01) |
| Education[9] | .08* | (.03) | | | .04 | (.03) | .04 | (.03) |
| High school diploma/GED | .12*** | (.03) | | | .07* | (.04) | .07 | (.04) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Some college | .12** | (.04) | .07 | (.04) | .07 | (.04) |
| AA/technical degree | .10* | (.04) | .05 | (.04) | .05 | (.04) |
| College degree or higher | | | | | | |
| Monthly family income[10] | | | | | | |
| $500-999 | -.01 | (.02) | -.01 | (.02) | -.01 | (.02) |
| $1000-1999 | .01 | (.02) | -.01 | (.02) | -.01 | (.02) |
| $2000+ | .04* | (.02) | .02 | (.02) | .01 | (.02) |
| Employment[11] | | | | | | |
| Part-time | -.01 | (.02) | -.01 | (.02) | -.01 | (.02) |
| Full-time | .01 | (.01) | .00 | (.02) | .00 | (.02) |
| Family structure[12] | | | | | | |
| Steady partner | .01 | (.02) | .01 | (.02) | .02 | (.02) |
| Cohabiting | .01 | (.02) | .02 | (.02) | .02 | (.02) |
| Married | .06** | (.02) | .02 | (.02) | .02 | (.02) |
| Religious attendance[13] | | | | | | |
| Once or twice a month | | | | | | |
| Once a week or more | -.02 | (.02) | -.02 | (.02) | -.02 | (.02) |
| | .00 | (.02) | -.01 | (.02) | -.01 | (.02) |
| Does well on schoolwork | -.02 | (.01) | -.02 | (.01) | -.02 | (.01) |
| Happy in the past month | -.05*** | (.01) | -.01 | (.01) | -.01 | (.01) |
| Peers who have had sex[14] | | | | | | |
| Only a few | -.03** | (.01) | -.03* | (.01) | -.03* | (.01) |
| About half or more | -.09*** | (.01) | -.10*** | (.02) | -.09*** | (.02) |
| Believes parent think s/he should wait to have sex | .03* | (.01) | .02 | (.02) | .02 | (.02) |
| Parent believes no sex before marriage[15] | | | | | | |
| A little true | .01 | (.02) | .00 | (.02) | .00 | (.02) |
| Very true | .00 | (.02) | -.02 | (.02) | -.02 | (.02) |
| Parent participating[16] | -.06*** | (.01) | -.07*** | (.02) | -.07*** | (.02) |
| Has teen "parent"[17] | -.05 | (.03) | -.02 | (.03) | -.02 | (.03) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Monitoring: C[18, 19] | .01 | (.01) | | .00 | (.01) | .00 | (.02) |
| Monitoring: P[20] | .04*** | (.01) | | .03* | (.01) | .06** | (.02) |
| Quality: C[21] | .01 | (.02) | | .01 | (.02) | .01 | (.04) |
| Quality: P | .03 | (.02) | | .01 | (.03) | .05 | (.05) |
| Communication: C[22] | -.08*** | (.01) | | -.06*** | (.02) | -.01 | (.03) |
| Communication: P | -.04** | (.01) | | .01 | (.02) | .01 | (.03) |
| Responsiveness: C[23] | -.05** | (.02) | | -.02 | (.02) | -.05 | (.04) |
| Responsiveness: P | -.04 | (.02) | | -.02 | (.03) | -.01 | (.06) |
| Parent status 2 x Intervention | | | | | | | |
| Brief | -.01 | (.08) | | | | -.02 | (.09) |
| Enhanced | -.06 | (.08) | | | | -.05 | (.09) |
| Parent status 3 x Intervention | | | | | | | |
| Brief | -.02 | (.05) | | | | -.03 | (.07) |
| Enhanced | .09 | (.05) | | | | .10 | (.06) |
| Parent status 4 x Intervention | | | | | | | |
| Brief | .00 | (.05) | | | | -.01 | (.07) |
| Enhanced | .03 | (.05) | | | | .07 | (.06) |
| Monitoring: C x Intervention | | | | | | | |
| Brief | .00 | (.02) | | | | .01 | (.02) |
| Enhanced | -.01 | (.02) | | | | .01 | (.02) |
| Monitoring: P x Intervention | | | | | | | |
| Brief | -.02 | (.03) | | | | -.04 | (.03) |
| Enhanced | -.04 | (.03) | | | | -.05 | (.03) |
| Quality: C x Intervention | | | | | | | |
| Brief | -.02 | (.04) | | | | -.02 | (.05) |
| Enhanced | -.01 | (.04) | | | | .01 | (.05) |
| Quality: P x | .01 | (.06) | | | | -.02 | (.07) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Intervention | -.09 | (.06) | | | | | -.07 | (.07) |
| Brief | | | | | | | | |
| Enhanced | | | | | | | | |
| Communication: C x Intervention | | | | | | | | |
| Brief | -.07* | (.03) | | | | | -.06 | (.04) |
| Enhanced | -.08* | (.03) | | | | | -.08* | (.04) |
| Communication: P x Intervention | | | | | | | | |
| Brief | -.01 | (.04) | | | | | -.03 | (.05) |
| Enhanced | -.03 | (.03) | | | | | .03 | (.04) |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | .01 | (.05) | | | | | .05 | (.05) |
| Enhanced | -.04 | (.04) | | | | | .04 | (.05) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | -.01 | (.06) | | | | | .04 | (.07) |
| Enhanced | -.12* | (.06) | | | | | -.07 | (.07) |
| Constant | | | .41*** | (.03) | .41** | (.13) | .16 | (.19) |
| Observations | | | 3956 | | 3477 | | 3477 | |
| Groups | | | 1104 | | 1001 | | 1001 | |
| Log-likelihood | | | -1143.84 | | -958.25 | | -945.60 | |
| Sigma_u | | | .33 | (.01) | .31 | (.01) | .30 | (.01) |
| Sigma_e | | | .25 | (.00) | .25 | (.00) | .25 | (.00) |
| Rho | | | .63 | (.01) | .60 | (.02) | .60 | (.02) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Children's health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex.

[2] Children's best fitting class at baseline was determined using latent class analysis on the behaviors listed in Footnote 1. Class 1 is the reference category.

[3] The General Intervention is the reference category.
[4] Athens is the reference category.
[5] Parents' best fitting class at baseline was determined using latent class analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events. Class 1 is the reference category.
[6] Parents' health lifestyle statuses were determined using latent transition analysis on the behaviors listed in Footnote 5. Parent status 1 is the reference category. Parent status 1 = Healthy, lower sexual risk, moderate stress. Parent status 2 = Somewhat healthy, high sexual risk, some stress. Parent status 3 = Unhealthy, some sexual risk, high stress. Parent status 4 = Unhealthy, lower sexual risk, low stress.
[7] Male is the reference category.
[8] 4$^{th}$ grade is the reference category at baseline, and 5$^{th}$ grade is the indicator value.
[9] Less than a high school diploma or GED is the reference category.
[10] $0-499 is the reference category.
[11] Other employment status (e.g. student, unemployed) is the reference category.
[12] No steady partner is the reference category.
[13] Never or a few times a year is the reference category.
[14] None is the reference category.
[15] Not at all true is the reference category.
[16] "Parent" includes biological, adoptive, and step-parents.
[17] The parent or guardian participating in the program, not necessarily the child's biological parent, was a teen parent.
[18] "C" stands for the parenting practice from the child's perspective.
[19] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.
[20] "P" stands for the parenting practice from the parent's perspective.
[21] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.
[22] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.
[23] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

**Table A.14: Variables Associated with Probability of Child Membership in Health Lifestyle Status[1] 4 (Healthy and High-Risk), Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | Model 1: Unadjusted | | Model 2: Q5 | | Model 3: Q6 | | Model 4: Q9 | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Child class at baseline[2] | | | | | | | | |
| 2 | .07** | (.03) | | | | | | |
| 3 | -.05** | (.02) | | | | | | |
| 4 | .40*** | (.04) | | | | | | |
| Intervention group[3] | | | | | | | | |
| Brief | -.01 | (.02) | -.01 | (.02) | -.02 | (.02) | .11 | (.18) |
| Enhanced | -.03 | (.02) | -.03 | (.02) | -.05* | (.02) | -.04 | (.18) |
| Site[4] | | | | | | | | |
| Atlanta | .02 | (.02) | .02 | (.02) | .00 | (.02) | .00 | (.02) |
| Little Rock | .01 | (.02) | .01 | (.02) | .01 | (.02) | .02 | (.02) |
| Parent class at baseline[5] | | | | | | | | |
| 2 | .03 | (.05) | | | | | | |
| 3 | .07** | (.02) | | | | | | |
| 4 | .02 | (.02) | | | | | | |
| Parent status 2[6] | .00 | (.03) | .00 | (.03) | .01 | (.03) | -.03 | (.05) |
| Parent status 3 | .03 | (.02) | .02 | (.02) | .04* | (.02) | .07* | (.03) |
| Parent status 4 | -.03* | (.02) | -.02 | (.02) | .01 | (.02) | -.01 | (.03) |
| Female[7] | -.10*** | (.01) | | | -.11*** | (.02) | -.11*** | (.02) |
| Child age | .04*** | (.00) | | | .02** | (.01) | .02* | (.01) |
| Grade[8] | .03*** | (.00) | | | -.01 | (.01) | -.01 | (.01) |
| Education[9] | | | | | | | | |
| High school diploma/GED | | | | | | | | |
| Some college | -.07** | (.02) | | | -.06** | (.02) | -.06** | (.02) |
| AA/technical degree | -.08** | (.02) | | | -.07** | (.02) | -.07** | (.02) |
| College degree or | -.06* | (.03) | | | -.05 | (.03) | -.05 | (.03) |
| higher | -.04 | (.03) | | | -.03 | (.03) | -.03 | (.03) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Monthly family income[10] | | | | | | |
| $500-999 | .01 | (.02) | -.01 | (.02) | -.01 | (.02) |
| $1000-1999 | .00 | (.02) | .01 | (.02) | .01 | (.02) |
| $2000+ | .01 | (.02) | .01 | (.02) | .01 | (.02) |
| Employment[11] | | | | | | |
| Part-time | -.01 | (.02) | -.01 | (.02) | -.01 | (.02) |
| Full-time | .00 | (.01) | .00 | (.01) | .00 | (.01) |
| Family structure[12] | | | | | | |
| Steady partner | -.01 | (.01) | -.01 | (.01) | -.01 | (.01) |
| Cohabiting | .00 | (.02) | .00 | (.02) | .01 | (.02) |
| Married | -.05** | (.02) | -.02 | (.02) | -.02 | (.02) |
| Religious attendance[13] | | | | | | |
| Once or twice a month | | | | | | |
| Once a week or | -.01 | (.01) | -.01 | (.01) | -.01 | (.01) |
| more | -.01 | (.01) | -.01 | (.01) | -.01 | (.01) |
| Does well on schoolwork | .00 | (.01) | -.01 | (.01) | -.01 | (.01) |
| Happy in the past month | .05*** | (.01) | .00 | (.01) | .00 | (.01) |
| Peers who have had sex[14] | | | | | | |
| Only a few | .07*** | (.01) | .05*** | (.01) | .05*** | (.01) |
| About half or more | .14*** | (.01) | .10*** | (.01) | .10*** | (.01) |
| Believes parent think s/he should wait to have sex | -.04** | (.01) | -.02 | (.01) | -.02 | (.01) |
| Parent believes no sex before marriage[15] | | | | | | |
| A little true | -.02 | (.01) | -.02 | (.01) | -.02 | (.01) |
| Very true | -.02 | (.01) | -.01 | (.01) | -.01 | (.01) |
| Parent participating[16] | .08*** | (.01) | .04** | (.01) | .04** | (.01) |
| Has teen "parent"[17] | .01 | (.02) | -.01 | (.02) | -.01 | (.02) |
| Monitoring: C[18, 19] | -.01 | (.01) | .00 | (.01) | .00 | (.01) |
| Monitoring: P[20] | -.04*** | (.01) | -.03** | (.01) | -.06** | (.02) |
| Quality: C[21] | -.04** | (.01) | .00 | (.02) | .03 | (.03) |
| Quality: P | -.03 | (.02) | .01 | (.02) | .01 | (.04) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Communication: C[22] | .05*** | (.01) | .03* | (.01) | .03 | (.02) |
| Communication: P | .06*** | (.01) | -.01 | (.01) | -.04 | (.02) |
| Responsiveness: C[23] | .06*** | (.01) | .02 | (.02) | .05 | (.03) |
| Responsiveness: P | .08*** | (.02) | .05* | (.02) | .07 | (.04) |
| Parent status 2 x Intervention | | | | | | |
| Brief | .05 | (.06) | | | .03 | (.07) |
| Enhanced | .10 | (.06) | | | .09 | (.07) |
| Parent status 3 x Intervention | | | | | | |
| Brief | -.01 | (.04) | | | .00 | (.05) |
| Enhanced | -.09* | (.04) | | | -.07 | (.05) |
| Parent status 4 x Intervention | | | | | | |
| Brief | .03 | (.04) | | | .01 | (.05) |
| Enhanced | .04 | (.04) | | | .03 | (.05) |
| Monitoring: C x Intervention | | | | | | |
| Brief | -.02 | (.02) | | | -.01 | (.02) |
| Enhanced | .00 | (.01) | | | .00 | (.02) |
| Monitoring: P x Intervention | | | | | | |
| Brief | -.02 | (.02) | | | .00 | (.03) |
| Enhanced | .04 | (.02) | | | .07** | (.02) |
| Quality: C x Intervention | | | | | | |
| Brief | -.06 | (.03) | | | -.06 | (.04) |
| Enhanced | -.04 | (.03) | | | -.04 | (.04) |
| Quality: P x Intervention | | | | | | |
| Brief | .01 | (.04) | | | .03 | (.05) |
| Enhanced | -.01 | (.04) | | | -.05 | (.05) |
| Communication: C x | .00 | (.02) | | | .01 | (.03) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Intervention | .00 | (.02) | | | | | -.01 | (.03) |
| Brief | | | | | | | | |
| Enhanced | | | | | | | | |
| Communication: P x Intervention | | | | | | | | |
| Brief | .04 | (.03) | | | | | .04 | (.03) |
| Enhanced | .06* | (.03) | | | | | .05 | (.03) |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | -.05 | (.04) | | | | | -.05 | (.04) |
| Enhanced | -.04 | (.04) | | | | | -.04 | (.04) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | .00 | (.04) | | | | | -.02 | (.06) |
| Enhanced | .02 | (.04) | | | | | -.02 | (.05) |
| Constant | | | .15*** | (.02) | -.03 | (.10) | -.08 | (.15) |
| Observations | | | 3956 | | 3477 | | 3477 | |
| Groups | | | 1104 | | 1001 | | 1001 | |
| Log-likelihood | | | -287.45 | | -113.50 | | -97.51 | |
| Sigma_u | | | .21 | (.01) | .19 | (.01) | .19 | (.01) |
| Sigma_e | | | .21 | (.00) | .21 | (.00) | .21 | (.00) |
| Rho | | | .48 | (.02) | .46 | (.02) | .46 | (.02) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Children's health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex.

[2] Children's best fitting class at baseline was determined using latent class analysis on the behaviors listed in Footnote 1. Class 1 is the reference category.

[3] The General Intervention is the reference category.

[4] Athens is the reference category.

[5] Parents' best fitting class at baseline was determined using latent class analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk

condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events. Class 1 is the reference category.

[6] Parents' health lifestyle statuses were determined using latent transition analysis on the behaviors listed in Footnote 5. Parent status 1 is the reference category. Parent status 1 = Healthy, lower sexual risk, moderate stress. Parent status 2 = Somewhat healthy, high sexual risk, some stress. Parent status 3 = Unhealthy, some sexual risk, high stress. Parent status 4 = Unhealthy, lower sexual risk, low stress.

[7] Male is the reference category.

[8] 4th grade is the reference category at baseline, and 5th grade is the indicator value.

[9] Less than a high school diploma or GED is the reference category.

[10] $0-499 is the reference category.

[11] Other employment status (e.g. student, unemployed) is the reference category.

[12] No steady partner is the reference category.

[13] Never or a few times a year is the reference category.

[14] None is the reference category.

[15] Not at all true is the reference category.

[16] "Parent" includes biological, adoptive, and step-parents.

[17] The parent or guardian participating in the program, not necessarily the child's biological parent, was a teen parent.

[18] "C" stands for the parenting practice from the child's perspective.

[19] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.

[20] "P" stands for the parenting practice from the parent's perspective.

[21] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.

[22] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.

[23] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

**Table A.15: Variables Associated with Probability of Parent Membership in Health Lifestyle Status[1] 1 (Healthy, Lower Sexual Risk, Positive Attitude Toward Sex, Moderate Stress), Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | Model 1: Unadjusted | | Model 2: Q5 | | Model 3: Q6 | | Model 4: Q9 | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Parent class at baseline[2] | | | | | | | | |
| 2 | -.60*** | (.05) | | | | | | |
| 3 | -.70*** | (.03) | | | | | | |
| 4 | -.68*** | (.02) | | | | | | |
| Intervention group[3] | | | | | | | | |
| Brief | .02 | (.03) | .03 | (.03) | .03 | (.03) | .25 | (.17) |
| Enhanced | -.03 | (.03) | -.03 | (.03) | -.05 | (.03) | -.10 | (.16) |
| Site[4] | | | | | | | | |
| Atlanta | .05 | (.03) | .04 | (.03) | .03 | (.03) | .03 | (.03) |
| Little Rock | .00 | (.03) | .00 | (.03) | -.03 | (.03) | -.03 | (.03) |
| Child class at baseline[5] | | | | | | | | |
| 2 | -.08 | (.04) | | | | | | |
| 3 | -.06* | (.03) | | | | | | |
| 4 | -.25*** | (.06) | | | | | | |
| Child status 2[6] | -.05*** | (.01) | -.07*** | (.02) | -.07*** | (.02) | -.08* | (.04) |
| Child status 3 | -.01 | (.01) | -.02* | (.01) | -.02 | (.01) | -.02 | (.02) |
| Child status 4 | .03* | (.01) | -.02 | (.02) | -.05** | (.02) | -.04 | (.03) |
| Female[7] | -.06 | (.07) | | | -.07 | (.07) | -.08 | (.07) |
| Parent age | .01*** | (.00) | | | .00**[21] | (.00) | .00**[21] | (.00) |
| Education[8] | | | | | | | | |
| High school diploma/GED | | | | | | | | |
| Some college | .00 | (.03) | | | .02 | (.03) | .03 | (.03) |
| AA/technical degree | .04 | (.03) | | | .05 | (.04) | .06 | (.04) |
| College degree or | .08* | (.04) | | | .11** | (.04) | .12** | (.04) |
| higher | .15*** | (.04) | | | .16** | (.05) | .16*** | (.05) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Monthly family income[9] | | | | | | |
| $500-999 | .00 | (.01) | -.01 | (.01) | .00 | (.01) |
| $1000-1999 | .01 | (.01) | .01 | (.01) | .01 | (.01) |
| $2000+ | .03* | (.01) | .01 | (.02) | .01 | (.02) |
| Employment[10] | | | | | | |
| Part-time | -.02 | (.01) | -.02 | (.01) | -.02 | (.01) |
| Full-time | .00 | (.01) | -.01 | (.01) | -.01 | (.01) |
| Family structure[11] | | | | | | |
| Steady partner | -.01 | (.01) | .00 | (.01) | -.01 | (.01) |
| Cohabiting | -.03* | (.01) | -.03* | (.01) | -.03* | (.01) |
| Married | -.03* | (.01) | -.02 | (.02) | -.03 | (.02) |
| Age of sexual debut[12] | | | | | | |
| 13-15 | -.04 | (.05) | -.04 | (.05) | -.03 | (.05) |
| 16-17 | -.02 | (.05) | -.04 | (.06) | -.03 | (.06) |
| 18+ | .04 | (.06) | -.01 | (.06) | .00 | (.06) |
| Birth control first sex | .07** | (.02) | .02 | (.03) | .02 | (.03) |
| Condom use first sex | .08** | (.02) | .07* | (.03) | .07* | (.03) |
| Believes it's his/her job to teach child about sex | .02 | (.01) | .01 | (.01) | .01 | (.01) |
| Religious attendance[13] | | | | | | |
| Once or twice a month | | | | | | |
| Once a week or more | -.01<br>.00 | (.01)<br>(.01) | -.02<br>-.01 | (.01)<br>(.01) | -.02<br>-.01 | (.01)<br>(.01) |
| Believes religion is very important | .03* | (.01) | .03* | (.01) | .02* | (.01) |
| Child's parent[14] | .05*** | (.01) | .03*** | (.01) | .03*** | (.01) |
| Was a teen parent | -.01 | (.03) | .06 | (.03) | .06 | (.03) |
| Monitoring: C[15, 16] | .00 | (.00) | .00 | (.01) | .00 | (.01) |
| Monitoring: P[17] | .02* | (.01) | .01 | (.01) | .02 | (.02) |
| Quality: C[18] | -.02* | (.01) | -.02 | (.01) | .01 | (.02) |
| Quality: P | .07*** | (.02) | .05** | (.02) | .00 | (.03) |
| Communication: C[19] | .03*** | (.01) | .01 | (.01) | .04* | (.02) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Communication: P | .08*** | (.01) | .03* | (.01) | .01 | (.02) |
| Responsiveness: C[20] | .02* | (.01) | -.01 | (.01) | -.04 | (.02) |
| Responsiveness: P | .10*** | (.01) | .04* | (.02) | .08* | (.03) |
| Child status 2 x Intervention | | | | | | |
| Brief | .00 | (.03) | | | -.01 | (.05) |
| Enhanced | .02 | (.03) | | | .03 | (.05) |
| Child status 3 x Intervention | | | | | | |
| Brief | .02 | (.03) | | | .02 | (.03) |
| Enhanced | -.02 | (.02) | | | -.01 | (.03) |
| Child status 4 x Intervention | | | | | | |
| Brief | -.01 | (.03) | | | .00 | (.05) |
| Enhanced | .00 | (.03) | | | -.02 | (.05) |
| Monitoring: C x Intervention | | | | | | |
| Brief | -.02 | (.01) | | | -.01 | (.01) |
| Enhanced | -.01 | (.01) | | | -.01 | (.01) |
| Monitoring: P x Intervention | | | | | | |
| Brief | .00 | (.02) | | | .01 | (.02) |
| Enhanced | .00 | (.02) | | | -.01 | (.02) |
| Quality: C x Intervention | | | | | | |
| Brief | -.06* | (.03) | | | -.05 | (.03) |
| Enhanced | -.06* | (.03) | | | -.04 | (.03) |
| Quality: P x Intervention | | | | | | |
| Brief | .00 | (.04) | | | .07 | (.04) |
| Enhanced | .02 | (.04) | | | .07 | (.04) |
| Communication: C x | -.03 | (.02) | | | -.01 | (.02) |
| Intervention | -.03 | (.02) | | | -.05* | (.02) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Brief | | | | | | | | |
| Enhanced | | | | | | | | |
| Communication: P x Intervention | | | | | | | | |
| Brief | -.02 | (.02) | | | | | .01 | (.03) |
| Enhanced | .03 | (.02) | | | | | .03 | (.03) |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | -.01 | (.03) | | | | | .02 | (.03) |
| Enhanced | .01 | (.03) | | | | | .05 | (.03) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | -.09* | (.04) | | | | | -.13** | (.04) |
| Enhanced | .03 | (.04) | | | | | .00 | (.04) |
| Constant | | | .29*** | (.03) | -.25* | (.13) | -.30 | (.16) |
| Observations | | | 3956 | | 3386 | | 3386 | |
| Groups | | | 1104 | | 972 | | 972 | |
| Log-likelihood | | | 369.53 | | 363.78 | | -380.75 | |
| Sigma_u | | | .37 | (.01) | .36 | (.01) | .36 | (.01) |
| Sigma_e | | | .14 | (.00) | .14 | (.00) | .14 | (.00) |
| Rho | | | .86 | (.01) | .86 | (.01) | .86 | (.01) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[2] Parents' best fitting class at baseline was determined using latent class analysis on the behaviors listed in Footnote 1. Class 1 is the reference category and the class titles are the same as the status titles.

[3] The General Intervention is the reference category.

[4] Athens is the reference category.

[5] Children's best fitting class at baseline was determined using latent class analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched

under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex. Class 1 is the reference category. Child class 1 = Healthy and low-risk. Child class 2 = Unhealthy and high-risk. Child class 3 = Unhealthy and low-risk. Child class 4 = Healthy and high-risk.

[6] Children's health lifestyle statuses were determined using latent transition analysis on the behaviors listed in Footnote 5. Child status 1 is the reference category. The class titles are the same as the status titles.

[7] Male is the reference category.

[8] Less than a high school diploma or GED is the reference category.

[9] $0-499 is the reference category.

[10] Other employment status (e.g. student, unemployed) is the reference category.

[11] No steady partner is the reference category.

[12] Age 12 or younger is the reference category.

[13] Never or a few times a year is the reference category.

[14] "Parent" includes biological, adoptive, and step-parents.

[15] "C" stands for the parenting practice from the child's perspective.

[16] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.

[17] "P" stands for the parenting practice from the parent's perspective.

[18] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.

[19] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.

[20] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

[21] Age is positively associated with membership in health lifestyle status 4, but the number is to small to be captured when rounding to the hundredth decimal place.

**Table A.16: Variables Associated with Probability of Parent Membership in Health Lifestyle Status[1] 2 (Somewhat Healthy, High Condom and Birth Control Risk, Unhealthy Attitude Toward Sex, Moderate Stress), Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | Model 1: Unadjusted | | Model 2: Q5 | | Model 3: Q6 | | Model 4: Q9 | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Parent class at baseline[2] | | | | | | | | |
| 2 | .49*** | (.02) | | | | | | |
| 3 | .01 | (.01) | | | | | | |
| 4 | .01 | (.01) | | | | | | |
| Intervention group[3] | | | | | | | | |
| Brief | .00 | (.01) | .00 | (.01) | .00 | (.01) | .09 | (.12) |
| Enhanced | -.01 | (.01) | -.01 | (.01) | -.01 | (.01) | .21 | (.11) |
| Site[4] | | | | | | | | |
| Atlanta | .01 | (.01) | .01 | (.01) | .01 | (.01) | .01 | (.01) |
| Little Rock | .01 | (.01) | .01 | (.01) | .01 | (.01) | .01 | (.01) |
| Child class at baseline[5] | | | | | | | | |
| 2 | .00 | (.02) | | | | | | |
| 3 | .01 | (.01) | | | | | | |
| 4 | .03 | (.02) | | | | | | |
| Child status 2[6] | .02 | (.01) | .02 | (.01) | .02 | (.01) | .02 | (.02) |
| Child status 3 | -.01 | (.01) | .00 | (.01) | .01 | (.01) | .02 | (.02) |
| Child status 4 | .00 | (.01) | .01 | (.01) | .01 | (.01) | .00 | (.02) |
| Female[7] | -.01 | (.02) | | | .00 | (.03) | .00 | (.03) |
| Parent age | .00** | (.00) | | | .00* | (.00) | .00* | (.00) |
| Education[8] | | | | | | | | |
| High school diploma/GED | | | | | | | | |
| Some college | -.02 | (.01) | | | -.01 | (.01) | -.01 | (.01) |
| AA/technical degree | -.01 | (.01) | | | .00 | (.01) | .00 | (.01) |
| College degree or | -.02 | (.01) | | | .00 | (.02) | .00 | (.02) |
| higher | -.01 | (.01) | | | .00 | (.02) | -.01 | (.02) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Monthly family income[9] | | | | | | |
| $500-999 | .00 | (.01) | -.01 | (.01) | -.01 | (.01) |
| $1000-1999 | .00 | (.01) | .00 | (.01) | .00 | (.01) |
| $2000+ | .00 | (.01) | .00 | (.01) | .00 | (.01) |
| Employment[10] | | | | | | |
| Part-time | .02 | (.01) | .02 | (.01) | .02 | (.01) |
| Full-time | .00 | (.01) | .00 | (.01) | .00 | (.01) |
| Family structure[11] | | | | | | |
| Steady partner | .00 | (.01) | .02 | (.01) | .01 | (.01) |
| Cohabiting | .01 | (.01) | .02 | (.01) | .02 | (.01) |
| Married | .01 | (.01) | .02 | (.01) | .02 | (.01) |
| Age of sexual debut[12] | | | | | | |
| 13-15 | -.02 | (.02) | -.03 | (.02) | -.03 | (.02) |
| 16-17 | -.03 | (.02) | -.03 | (.02) | -.03 | (.02) |
| 18+ | -.02 | (.02) | -.02 | (.02) | -.02 | (.02) |
| Birth control first sex | -.01 | (.01) | -.01 | (.01) | -.01 | (.01) |
| Condom use first sex | -.01 | (.01) | .00 | (.01) | .01 | (.01) |
| Believes it's his/her job to teach child about sex | -.05*** | (.01) | -.05*** | (.01) | -.04*** | (.01) |
| Religious attendance[13] | | | | | | |
| Once or twice a month | | | | | | |
| Once a week or more | .00 | (.01) | .00 | (.01) | .00 | (.01) |
| | .00 | (.01) | .01 | (.01) | .01 | (.01) |
| Believes religion is very important | -.01 | (.01) | -.01 | (.01) | -.01 | (.01) |
| Child's parent[14] | .00 | (.00) | .00 | (.01) | .00 | (.01) |
| Was a teen parent | .00 | (.01) | .00 | (.01) | .00 | (.01) |
| Monitoring: C[15, 16] | .00 | (.00) | .01 | (.00) | .01 | (.01) |
| Monitoring: P[17] | -.02*** | (.01) | -.01 | (.01) | -.03** | (.01) |
| Quality: C[18] | -.01 | (.01) | .00 | (.01) | .01 | (.02) |
| Quality: P | -.05*** | (.01) | -.03* | (.01) | .00 | (.02) |
| Communication: C[19] | .01 | (.01) | .02[21] | (.01) | .00 | (.01) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Communication: P | -.01* | (.01) | .00 | (.01) | .00 | (.02) |
| Responsiveness: C[20] | .00 | (.01) | .00 | (.01) | .01 | (.02) |
| Responsiveness: P | -.06*** | (.01) | -.03 | (.01) | .01 | (.03) |
| Child status 2 x Intervention | | | | | | |
| Brief | .02 | (.02) | | | .01 | (.03) |
| Enhanced | -.01 | (.02) | | | -.01 | (.03) |
| Child status 3 x Intervention | | | | | | |
| Brief | -.01 | (.02) | | | .00 | (.03) |
| Enhanced | -.02 | (.02) | | | -.03 | (.02) |
| Child status 4 x Intervention | | | | | | |
| Brief | .02 | (.02) | | | .02 | (.03) |
| Enhanced | .04 | (.02) | | | .02 | (.03) |
| Monitoring: C x Intervention | | | | | | |
| Brief | -.02 | (.01) | | | -.02 | (.01) |
| Enhanced | .00 | (.01) | | | .00 | (.01) |
| Monitoring: P x Intervention | | | | | | |
| Brief | .01 | (.01) | | | .03 | (.02) |
| Enhanced | .01 | (.01) | | | .03 | (.02) |
| Quality: C x Intervention | | | | | | |
| Brief | -.01 | (.02) | | | -.01 | (.03) |
| Enhanced | -.01 | (.02) | | | -.03 | (.02) |
| Quality: P x Intervention | | | | | | |
| Brief | -.03 | (.03) | | | -.05 | (.03) |
| Enhanced | .00 | (.03) | | | -.01 | (.03) |
| Communication: C x Intervention | .01 | (.02) | | | .03 | (.02) |
| | .00 | (.01) | | | .01 | (.02) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Brief | | | | | | | | |
| Enhanced | | | | | | | | |
| Communication: P x Intervention | | | | | | | | |
| Brief | .00 | (.02) | | | | | .00 | (.02) |
| Enhanced | -.01 | (.02) | | | | | .00 | (.02) |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | -.01 | (.02) | | | | | -.02 | (.03) |
| Enhanced | .00 | (.02) | | | | | .00 | (.03) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | -.01 | (.03) | | | | | -.02 | (.04) |
| Enhanced | -.04 | (.03) | | | | | -.09** | (.04) |
| Constant | | | .02* | (.01) | .16* | (.06) | .06 | (.09) |
| Observations | | | 3956 | | 3386 | | 3386 | |
| Groups | | | 1104 | | 972 | | 972 | |
| Log-likelihood | | | 1571.80 | | 1345.69 | | 1359.08 | |
| Sigma_u | | | .10 | (.00) | .10 | (.00) | .10 | (.00) |
| Sigma_e | | | .14 | (.00) | .14 | (.00) | .14 | (.00) |
| Rho | | | .36 | (.02) | .34 | (.02) | .34 | (.02) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[2] Parents' best fitting class at baseline was determined using latent class analysis on the behaviors listed in Footnote 1. Class 1 is the reference category and the class titles are the same as the status titles.

[3] The General Intervention is the reference category.

[4] Athens is the reference category.

[5] Children's best fitting class at baseline was determined using latent class analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched

under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex. Class 1 is the reference category. Child class 1 = Healthy and low-risk. Child class 2 = Unhealthy and high-risk. Child class 3 = Unhealthy and low-risk. Child class 4 = Healthy and high-risk.

[6] Children's health lifestyle statuses were determined using latent transition analysis on the behaviors listed in Footnote 5. Child status 1 is the reference category. The class titles are the same as the status titles.

[7] Male is the reference category.

[8] Less than a high school diploma or GED is the reference category.

[9] $0-499 is the reference category.

[10] Other employment status (e.g. student, unemployed) is the reference category.

[11] No steady partner is the reference category.

[12] Age 12 or younger is the reference category.

[13] Never or a few times a year is the reference category.

[14] "Parent" includes biological, adoptive, and step-parents.

[15] "C" stands for the parenting practice from the child's perspective.

[16] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.

[17] "P" stands for the parenting practice from the parent's perspective.

[18] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.

[19] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.

[20] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

[21] Child perception of communication is close to significance at $p = .051$.

**Table A.17: Variables Associated with Probability of Parent Membership in Health Lifestyle Status[1] 3 (Unhealthy, Multiple Partners and High Birth Control Risk, Positive Attitude Toward Sex, High Stress), Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | Model 1: Unadjusted | | Model 2: Q5 | | Model 3: Q6 | | Model 4: Q9 | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Parent class at baseline[2] | | | | | | | | |
| 2 | .11 | (.06) | | | | | | |
| 3 | .69*** | (.03) | | | | | | |
| 4 | .21*** | (.02) | | | | | | |
| Intervention group[3] | | | | | | | | |
| Brief | -.02 | (.03) | -.02 | (.03) | -.03 | (.03) | -.40* | (.17) |
| Enhanced | -.02 | (.03) | -.02 | (.03) | -.02 | (.03) | -.02 | (.16) |
| Site[4] | | | | | | | | |
| Atlanta | -.04 | (.03) | -.04 | (.03) | -.07* | (.03) | -.07* | (.03) |
| Little Rock | .00 | (.03) | .00 | (.03) | .02 | (.03) | .02 | (.03) |
| Child class at baseline[5] | | | | | | | | |
| 2 | .06 | (.04) | | | | | | |
| 3 | -.01 | (.03) | | | | | | |
| 4 | .01 | (.06) | | | | | | |
| Child status 2[6] | .02 | (.01) | .04* | (.02) | .02 | (.02) | .03 | (.04) |
| Child status 3 | .00 | (.01) | .01 | (.01) | .00 | (.01) | -.01 | (.02) |
| Child status 4 | .00 | (.01) | .02 | (.02) | .02 | (.02) | .03 | (.03) |
| Female[7] | .14* | (.07) | | | .13* | (.07) | .13* | (.07) |
| Parent age | -.01*** | (.00) | | | -.01*** | (.00) | -.01*** | (.00) |
| Education[8] | | | | | | | | |
| High school diploma/GED | | | | | | | | |
| Some college | -.10** | (.03) | | | -.10** | (.03) | -.10** | (.03) |
| AA/technical degree | -.19*** | (.03) | | | -.20*** | (.04) | -.20*** | (.04) |
| College degree or higher | -.19*** | (.04) | | | -.20*** | (.04) | -.20*** | (.04) |
| | -.26*** | (.04) | | | -.23*** | (.04) | -.23*** | (.04) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Monthly family income[9] | | | | | | |
| $500-999 | -.01 | (.01) | .01 | (.01) | .01 | (.01) |
| $1000-1999 | -.04** | (.01) | -.02 | (.01) | -.02 | (.01) |
| $2000+ | -.06*** | (.01) | -.02 | (.02) | -.02 | (.02) |
| Employment[10] | | | | | | |
| Part-time | -.03* | (.01) | -.02 | (.01) | -.02 | (.01) |
| Full-time | -.04*** | (.01) | -.03* | (.01) | -.02* | (.01) |
| Family structure[11] | | | | | | |
| Steady partner | .00 | (.01) | -.01 | (.01) | .00 | (.01) |
| Cohabiting | -.01 | (.01) | -.03 | (.01) | -.02 | (.01) |
| Married | -.01 | (.01) | -.01 | (.02) | -.01 | (.02) |
| Age of sexual debut[12] | | | | | | |
| 13-15 | .01 | (.05) | .00 | (.05) | .00 | (.05) |
| 16-17 | -.06 | (.05) | .00 | (.05) | -.01 | (.05) |
| 18+ | -.10 | (.06) | .00 | (.06) | -.01 | (.06) |
| Birth control first sex | -.09*** | (.02) | -.05 | (.03) | -.05 | (.03) |
| Condom use first sex | -.08*** | (.02) | -.06* | (.03) | -.06* | (.03) |
| Believes it's his/her job to teach child about sex | .00 | (.01) | .01 | (.01) | .01 | (.01) |
| Religious attendance[13] | | | | | | |
| Once or twice a month | | | | | | |
| Once a week or more | .00<br>-.02 | (.01)<br>(.01) | .01<br>.00 | (.01)<br>(.01) | .01<br>.00 | (.01)<br>(.01) |
| Believes religion is very important | -.02 | (.01) | -.02 | (.01) | -.02 | (.01) |
| Child's parent[14] | -.02*** | (.01) | .00 | (.01) | .00 | (.01) |
| Was a teen parent | .06* | (.03) | -.05 | (.03) | -.05 | (.03) |
| Monitoring: C[15, 16] | .00 | (.00) | .00 | (.01) | .00 | (.01) |
| Monitoring: P[17] | -.01 | (.01) | .00 | (.01) | .03 | (.02) |
| Quality: C[18] | .00 | (.01) | -.01 | (.01) | -.03 | (.02) |
| Quality: P | -.10*** | (.02) | -.10*** | (.01) | -.12*** | (.02) |
| Communication: C[19] | -.01 | (.01) | .00 | (.01) | -.02 | (.02) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Communication: P | -.04*** | (.01) | -.02 | (.01) | .02 | (.02) |
| Responsiveness: C[20] | -.02 | (.01) | .00 | (.01) | .02 | (.02) |
| Responsiveness: P | -.04** | (.01) | .00 | (.02) | -.08* | (.03) |
| Child status 2 x Intervention | | | | | | |
| Brief | -.02 | (.03) | | | -.03 | (.05) |
| Enhanced | .01 | (.03) | | | .00 | (.05) |
| Child status 3 x Intervention | | | | | | |
| Brief | -.02 | (.03) | | | -.02 | (.03) |
| Enhanced | .03 | (.02) | | | .03 | (.03) |
| Child status 4 x Intervention | | | | | | |
| Brief | .02 | (.03) | | | .00 | (.05) |
| Enhanced | -.04 | (.03) | | | -.03 | (.05) |
| Monitoring: C x Intervention | | | | | | |
| Brief | .01 | (.01) | | | .01 | (.01) |
| Enhanced | .00 | (.01) | | | .00 | (.01) |
| Monitoring: P x Intervention | | | | | | |
| Brief | -.01 | (.02) | | | -.05* | (.02) |
| Enhanced | -.03 | (.02) | | | -.03 | (.02) |
| Quality: C x Intervention | | | | | | |
| Brief | .01 | (.03) | | | .02 | (.03) |
| Enhanced | .03 | (.02) | | | .04 | (.03) |
| Quality: P x Intervention | | | | | | |
| Brief | .11** | (.04) | | | .11* | (.04) |
| Enhanced | -.04 | (.04) | | | -.03 | (.04) |
| Communication: C x Intervention | .01<br>.03 | (.02)<br>(.02) | | | .01<br>.03 | (.02)<br>(.02) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Brief | | | | | | | | |
| Enhanced | | | | | | | | |
| Communication: P x Intervention | | | | | | | | |
| Brief | .00 | (.02) | | | | | -.05 | (.03) |
| Enhanced | -.02 | (.02) | | | | | -.05 | (.03) |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | -.03 | (.03) | | | | | -.02 | (.03) |
| Enhanced | -.02 | (.03) | | | | | -.02 | (.03) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | .10** | (.04) | | | | | .14** | (.04) |
| Enhanced | .00 | (.04) | | | | | .07 | (.04) |
| Constant | | | .32*** | (.03) | 1.12*** | (.13) | 1.22*** | (.16) |
| Observations | | | 3956 | | 3386 | | 3386 | |
| Groups | | | 1104 | | 972 | | 972 | |
| Log-likelihood | | | 387.89 | | 388.79 | | 412.91 | |
| Sigma_u | | | .37 | (.01) | .34 | (.01) | .34 | (.01) |
| Sigma_e | | | .14 | (.00) | .14 | (.00) | .14 | (.00) |
| Rho | | | .87 | (.01) | .85 | (.01) | .85 | (.01) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[2] Parents' best fitting class at baseline was determined using latent class analysis on the behaviors listed in Footnote 1. Class 1 is the reference category and the class titles are the same as the status titles.

[3] The General Intervention is the reference category.

[4] Athens is the reference category.

[5] Children's best fitting class at baseline was determined using latent class analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched

under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex. Class 1 is the reference category. Child class 1 = Healthy and low-risk. Child class 2 = Unhealthy and high-risk. Child class 3 = Unhealthy and low-risk. Child class 4 = Healthy and high-risk.

[6] Children's health lifestyle statuses were determined using latent transition analysis on the behaviors listed in Footnote 5. Child status 1 is the reference category. The class titles are the same as the status titles.

[7] Male is the reference category.

[8] Less than a high school diploma or GED is the reference category.

[9] $0-499 is the reference category.

[10] Other employment status (e.g. student, unemployed) is the reference category.

[11] No steady partner is the reference category.

[12] Age 12 or younger is the reference category.

[13] Never or a few times a year is the reference category.

[14] "Parent" includes biological, adoptive, and step-parents.

[15] "C" stands for the parenting practice from the child's perspective.

[16] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.

[17] "P" stands for the parenting practice from the parent's perspective.

[18] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.

[19] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.

[20] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

**Table A.18: Variables Associated with Probability of Parent Membership in Health Lifestyle Status[1] 4 (Unhealthy, Low Sexual Risk Except for Birth Control, with a Positive Attitude Toward Sex and Low Stress), Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | Model 1: Unadjusted | | Model 2: Q5 | | Model 3: Q6 | | Model 4: Q9 | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Parent class at baseline[2] | | | | | | | | |
| 2 | -.06 | (.06) | | | | | | |
| 3 | .00 | (.03) | | | | | | |
| 4 | .46*** | (.02) | | | | | | |
| Intervention group[3] | | | | | | | | |
| Brief | -.01 | (.03) | -.01 | (.03) | .00 | (.03) | .23 | (.17) |
| Enhanced | .06* | (.03) | .06* | (.03) | .07* | (.03) | -.02 | (.16) |
| Site[4] | | | | | | | | |
| Atlanta | -.02 | (.03) | -.02 | (.03) | .03 | (.03) | .03 | (.03) |
| Little Rock | -.01 | (.03) | -.01 | (.03) | .01 | (.03) | .01 | (.03) |
| Child class at baseline[5] | | | | | | | | |
| 2 | .02 | (.05) | | | | | | |
| 3 | .05* | (.03) | | | | | | |
| 4 | .22** | (.06) | | | | | | |
| Child status 2[6] | .01 | (.01) | .00 | (.02) | .02 | (.02) | .02 | (.04) |
| Child status 3 | .02 | (.01) | .01 | (.01) | 01 | (.01) | .02 | (.02) |
| Child status 4 | -.02 | (.01) | -.02 | (.02) | .01 | (.02) | .02 | (.04) |
| Female[7] | -.07 | (.07) | | | -.07 | (.07) | -.07 | (.07) |
| Parent age | .00 | (.00) | | | .00 | (.00) | .00 | (.00) |
| Education[8] | | | | | | | | |
| High school diploma/GED | | | | | | | | |
| Some college | .12*** | (.03) | | | .08* | (.03) | .08* | (.03) |
| AA/technical degree | .16*** | (.03) | | | .14*** | (.04) | .14*** | (.04) |
| College degree or | .12** | (.04) | | | .09* | (.04) | .08 | (.04) |
| higher | .13** | (.04) | | | .08 | (.05) | .07 | (.05) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Monthly family income[9] | | | | | | |
| $500-999 | .01 | (.01) | .00 | (.01) | .00 | (.01) |
| $1000-1999 | .02 | (.01) | .01 | (.01) | .00 | (.01) |
| $2000+ | .02 | (.01) | .00 | (.02) | .00 | (.02) |
| Employment[10] | | | | | | |
| Part-time | .02* | (.01) | .02 | (.01) | .03* | (.01) |
| Full-time | .03** | (.01) | .03* | (.01) | .03** | (.01) |
| Family structure[11] | | | | | | |
| Steady partner | -.02 | (.01) | -.01 | (.01) | -.02 | (.01) |
| Cohabiting | .02 | (.01) | .02 | (.01) | .02 | (.01) |
| Married | .03 | (.01) | .01 | (.02) | .01 | (.02) |
| Age of sexual debut[12] | | | | | | |
| 13-15 | .06 | (.05) | .07 | (.06) | .07 | (.06) |
| 16-17 | .12* | (.05) | .09 | (.06) | .09 | (.06) |
| 18+ | .08 | (.06) | .04 | (.06) | .04 | (.06) |
| Birth control first sex | .04 | (.02) | .04 | (.03) | .04 | (.03) |
| Condom use first sex | .02 | (.02) | -.02 | (.03) | -.02 | (.03) |
| Believes it's his/her job to teach child about sex | .02 | (.01) | .01 | (.01) | .01 | (.01) |
| Religious attendance[13] | | | | | | |
| Once or twice a month | | | | | | |
| Once a week or more | .01 | (.01) | .00 | (.01) | .00 | (.01) |
| | .01 | (.01) | .01 | (.01) | .01 | (.01) |
| Believes religion is very important | .00 | (.01) | .00 | (.01) | .01 | (.01) |
| Child's parent[14] | -.04*** | (.01) | -.03*** | (.01) | -.03*** | (.01) |
| Was a teen parent | -.05* | (.03) | -.01 | (.03) | -.01 | (.03) |
| Monitoring: C[15, 16] | .00 | (.00) | .00 | (.01) | -.02 | (.01) |
| Monitoring: P[17] | .01 | (.01) | .00 | (.01) | -.01 | (.02) |
| Quality: C[18] | .04*** | (.01) | .03** | (.01) | .00 | (.02) |
| Quality: P | .08*** | (.02) | .08*** | (.02) | .14*** | (.03) |
| Communication: C[19] | -.03*** | (.01) | -.02 | (.01) | .00 | (.02) |

| | | | | | | |
|---|---|---|---|---|---|---|
| Communication: P | -.04*** | (.01) | -.02 | (.01) | -.04 | (.02) |
| Responsiveness: C[20] | .00 | (.01) | .02 | (.01) | .03 | (.03) |
| Responsiveness: P | .00 | (.01) | .00 | (.02) | .00 | (.03) |
| Child status 2 x Intervention | | | | | | |
| Brief | .03 | (.03) | | | .03 | (.05) |
| Enhanced | -.01 | (.03) | | | -.03 | (.05) |
| Child status 3 x Intervention | | | | | | |
| Brief | -.01 | (.03) | | | -.03 | (.03) |
| Enhanced | .00 | (.03) | | | .00 | (.03) |
| Child status 4 x Intervention | | | | | | |
| Brief | -.03 | (.03) | | | -.03 | (.05) |
| Enhanced | .00 | (.03) | | | -.02 | (.05) |
| Monitoring: C x Intervention | | | | | | |
| Brief | .02 | (.01) | | | .02 | (.01) |
| Enhanced | .01 | (.01) | | | .01 | (.01) |
| Monitoring: P x Intervention | | | | | | |
| Brief | -.01 | (.02) | | | .00 | (.02) |
| Enhanced | .01 | (.02) | | | .02 | (.02) |
| Quality: C x Intervention | | | | | | |
| Brief | .05 | (.03) | | | .04 | (.03) |
| Enhanced | .06* | (.03) | | | .05 | (.03) |
| Quality: P x Intervention | | | | | | |
| Brief | -.12** | (.04) | | | -.17*** | (.05) |
| Enhanced | .01 | (.04) | | | -.03 | (.04) |
| Communication: C x Intervention | -.01 | (.02) | | | -.06* | (.03) |
| | .00 | (.02) | | | .00 | (.02) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Brief | | | | | | | | |
| Enhanced | | | | | | | | |
| Communication: P x Intervention | | | | | | | | |
| Brief | .01 | (.02) | | | | | .04 | (.03) |
| Enhanced | .00 | (.02) | | | | | .01 | (.03) |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | .03 | (.03) | | | | | .02 | (.03) |
| Enhanced | -.01 | (.03) | | | | | -.04 | (.03) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | -.01 | (.04) | | | | | .00 | (.05) |
| Enhanced | -.01 | (.04) | | | | | .01 | (.05) |
| Constant | | | .37*** | (.03) | .00 | (.13) | -.03 | (.17) |
| Observations | | | 3965 | | 3386 | | 3386 | |
| Groups | | | 1104 | | 972 | | 972 | |
| Log-likelihood | | | 287.18 | | 250.53 | | 269.02 | |
| Sigma_u | | | .37 | (.01) | .36 | (.01) | .36 | (.01) |
| Sigma_e | | | .15 | (.00) | .15 | (.00) | .15 | (.00) |
| Rho | | | .86 | (.01) | .86 | (.01) | .86 | (.01) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[2] Parents' best fitting class at baseline was determined using latent class analysis on the behaviors listed in Footnote 1. Class 1 is the reference category and the class titles are the same as the status titles.

[3] The General Intervention is the reference category.

[4] Athens is the reference category.

[5] Children's best fitting class at baseline was determined using latent class analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched

under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex. Class 1 is the reference category. Child class 1 = Healthy and low-risk. Child class 2 = Unhealthy and high-risk. Child class 3 = Unhealthy and low-risk. Child class 4 = Healthy and high-risk.

[6] Children's health lifestyle statuses were determined using latent transition analysis on the behaviors listed in Footnote 5. Child status 1 is the reference category. The class titles are the same as the status titles.

[7] Male is the reference category.

[8] Less than a high school diploma or GED is the reference category.

[9] $0-499 is the reference category.

[10] Other employment status (e.g. student, unemployed) is the reference category.

[11] No steady partner is the reference category.

[12] Age 12 or younger is the reference category.

[13] Never or a few times a year is the reference category.

[14] "Parent" includes biological, adoptive, and step-parents.

[15] "C" stands for the parenting practice from the child's perspective.

[16] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.

[17] "P" stands for the parenting practice from the parent's perspective.

[18] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.

[19] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.

[20] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

**Table A.19: The Effect of Interactions Between Intervention Type, Parenting Practices, and Parents' Health Lifestyles[1] on Children's Health Lifestyle Status[2] Membership Probabilities, Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | **Child Status 1** | | **Child Status 2** | | **Child Status 3** | | **Child Status 4** | |
|---|---|---|---|---|---|---|---|---|
| | *Healthy and low-risk* | | *Unhealthy and high-risk* | | *Unhealthy and low-risk* | | *Healthy and high-risk* | |
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Intervention group[3] | | | | | | | | |
| Brief | -.24 | (.21) | -.17 | (.18) | .27 | (.27) | .11 | (.18) |
| Enhanced | -.10 | (.21) | -.27 | (.18) | .48* | (.48) | -.04 | (.18) |
| Site[4] | | | | | | | | |
| Atlanta | .04 | (.03) | .01 | (.02) | -.06 | (.03) | .00 | (.02) |
| Little Rock | -.03 | (.02) | .00 | (.02) | .01 | (.03) | .02 | (.02) |
| Parent status 2[5] | -.10 | (.06) | .11* | (.05) | .04 | (.07) | -.03 | (.05) |
| Parent status 3 | -.08 | (.04) | .04 | (.04) | -.03 | (.05) | .07* | (.03) |
| Parent status 4 | -.04 | (.04) | .05 | (.04) | .00 | (.05) | -.01 | (.03) |
| Female[6] | .02 | (.02) | -.08*** | (.02) | .17*** | (.02) | -.11*** | (.02) |
| Child age | -.01 | (.01) | .00 | (.01) | -.01 | (.01) | .02* | (.01) |
| Grade[7] | -.01 | (.01) | -.01 | (.01) | .03*** | (.01) | -.01 | (.01) |
| Education[8] | | | | | | | | |
| High school diploma/GED | | | | | | | | |
| Some college | .00 | (.03) | .02 | (.02) | .04 | (.03) | -.06** | (.02) |
| AA/technical degree | .03 | (.03) | -.02 | (.03) | .07 | (.04) | -.07** | (.02) |
| College degree or higher | -.03 | (.04) | .00 | (.03) | .07 | (.04) | -.05 | (.03) |
| | -.02 | (.04) | .02 | (.03) | .05 | (.04) | -.03 | (.03) |
| Monthly family income[9] | | | | | | | | |
| $500-999 | .01 | (.02) | .01 | (.02) | -.01 | (.02) | -.01 | (.02) |
| $1000-1999 | .01 | (.02) | -.01 | (.02) | -.01 | (.02) | .01 | (.02) |
| $2000+ | -.01 | (.02) | .02 | (.02) | .01 | (.02) | .01 | (.02) |
| Employment[10] | .00 | (.02) | .03 | (.02) | -.01 | (.02) | -.01 | (.02) |
| Part-time | .00 | (.01) | .01 | (.01) | .00 | (.02) | .00 | (.01) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Full-time | | | | | | | | |
| Family structure[11] | | | | | | | | |
| Steady partner | .01 | (.02) | -.01 | (.01) | .02 | (.02) | -.01 | (.01) |
| Cohabiting | -.01 | (.02) | -.02 | (.02) | .02 | (.02) | .01 | (.02) |
| Married | .00 | (.02) | .00 | (.02) | .02 | (.02) | -.02 | (.02) |
| Religious attendance[12] | | | | | | | | |
| Once or twice a month | | | | | | | | |
| Once a week or | .01 | (.02) | .02 | (.01) | -.02 | (.02) | -.01 | (.01) |
| more | .01 | (.02) | .01 | (.01) | -.01 | (.02) | -.01 | (.01) |
| Does well on schoolwork | .05*** | (.01) | -.03** | (.01) | -.02 | (.01) | -.01 | (.01) |
| Happy in the past month | .03* | (.01) | -.02 | (.01) | -.01 | (.01) | .00 | (.01) |
| Peers who have had sex[13] | | | | | | | | |
| Only a few | -.04*** | (.01) | .03** | (.01) | -.03* | (.01) | .05*** | (.01) |
| About half or more | -.03* | .01) | .03* | (.01) | -.09*** | (.02) | .10*** | (.01) |
| Believes parent think s/he should wait to have sex | .06*** | (.01) | -.06*** | (.01) | .02 | (.02) | -.02 | (.01) |
| Parent believes no sex before marriage[14] | | | | | | | | |
| A little true | .02 | (.01) | .00 | (.12) | .00 | (.02) | -.02 | (.01) |
| Very true | .03 | (.02) | .00 | (.01) | -.02 | (.02) | -.01 | (.01) |
| Parent participating[15] | .03* | (.02) | -.01 | (.01) | -.07*** | (.02) | .04** | (.01) |
| Has teen "parent"[16] | .00 | (.02) | .03 | (.02) | -.02 | (.03) | -.01 | (.02) |
| Monitoring: C[17] | .03* | (.01) | -.03** | (.01) | .00 | (.02) | .00 | (.01) |
| Monitoring: P | -.01 | (.02) | .00 | (.02) | .06** | (.02) | -.06** | (.02) |
| Quality: C[18] | .04 | (.03) | -.10*** | (.03) | .01 | (.04) | .03 | (.03) |
| Quality: P | .02 | (.05) | -.08* | (.04) | .05 | (.05) | .01 | (.04) |
| Communication: C[19] | .00 | (.02) | -.01 | (.02) | -.01 | (.03) | .03 | (.02) |
| Communication: P | -.01 | (.03) | .04 | (.03) | .01 | (.03) | -.04 | (.02) |
| Responsiveness: C[20] | .08* | (.04) | -.09** | (.03) | -.05 | (.04) | .05 | (.03) |
| Responsiveness: P | -.03 | (.05) | -.02 | (.04) | -.01 | (.06) | .07 | (.04) |
| Parent status 2 x Intervention | -.02 | (.08) | .01 | (.05) | -.02 | (.09) | .03 | (.07) |
| | .06 | (.08) | -.02 | (.05) | -.05 | (.09) | .09 | (.07) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Brief | | | | | | | | |
| Enhanced | | | | | | | | |
| Parent status 3 x Intervention | | | | | | | | |
| Brief | .03 | (.06) | .02 | (.02) | -.03 | (.07) | .00 | (.05) |
| Enhanced | -.01 | (.06) | -.01 | (.02) | .10 | (.06) | -.07 | (.05) |
| Parent status 4 x Intervention | | | | | | | | |
| Brief | -.04 | (.06) | .05 | (.05) | -.01 | (.07) | .01 | (.05) |
| Enhanced | -.06 | (.06) | -.05 | (.05) | .07 | (.06) | .03 | (.05) |
| Monitoring: C x Intervention | | | | | | | | |
| Brief | .02 | (.02) | -.02 | (.02) | .01 | (.02) | -.01 | (.02) |
| Enhanced | -.01 | (.02) | -.01 | (.02) | .01 | (.02) | .00 | (.02) |
| Monitoring: P x Intervention | | | | | | | | |
| Brief | .03 | (.03) | .02 | (.02) | -.04 | (.03) | .00 | (.03) |
| Enhanced | .00 | (.03) | -.02 | (.02) | -.05 | (.03) | .07** | (.02) |
| Quality: C x Intervention | | | | | | | | |
| Brief | .06 | (.04) | .03 | (.04) | -.02 | (.05) | -.06 | (.04) |
| Enhanced | -.01 | (.04) | .05 | (.04) | .01 | (.05) | -.04 | (.04) |
| Quality: P x Intervention | | | | | | | | |
| Brief | -.01 | (.06) | .02 | (.05) | -.02 | (.07) | .03 | (.05) |
| Enhanced | -.01 | (.06) | .13* | (.05) | -.07 | (.07) | -.05 | (.05) |
| Communication: C x Intervention | | | | | | | | |
| Brief | .06 | (.03) | -.02 | (.03) | -.06 | (.04) | .01 | (.03) |
| Enhanced | .08* | (.03) | .00 | (.03) | -.08* | (.04) | -.01 | (.03) |
| Communication: P x Intervention | .01 | (.04) | -.01 | (.03) | -.03 | (.05) | .04 | (.03) |
| Brief | -.01 | (.04) | -.07* | (.03) | .03 | (.04) | .05 | (.03) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Enhanced | | | | | | | | |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | -.12* | (.05) | .11** | (.04) | .05 | (.05) | -.05 | (.04) |
| Enhanced | -.06 | (.05) | .06 | (.04) | .04 | (.05) | -.04 | (.04) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | -.01 | (.06) | -.03 | (.05) | .04 | (.07) | -.02 | (.06) |
| Enhanced | .05 | (.06) | .01 | (.05) | -.07 | (.07) | -.02 | (.05) |
| Constant | -.02 | (.18) | .98*** | (.15) | .16 | (.19) | -.08 | (.15) |
| Observations | 3477 | | 3477 | | 3477 | | 3477 | |
| Groups | 1001 | | 1001 | | 1001 | | 1001 | |
| Log-likelihood | -609.02 | | -46.38 | | -945.60 | | -97.51 | |
| Sigma_u | .27 | (.01) | .24 | (.01) | .30 | (.01) | .19 | (.01) |
| Sigma_e | .23 | (.00) | .19 | (.00) | .25 | (.00) | .21 | (.00) |
| Rho | .58 | (.02) | .61 | (.02) | .60 | (.02) | .46 | (.02) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[2] Children's health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex.

[3] The General Intervention is the reference category.

[4] Athens is the reference category.

[5] Parent status 1 is the reference category. Parent status 1 = Healthy, lower sexual risk, moderate stress. Parent status 2 = Somewhat healthy, high sexual risk, some stress. Parent status 3 = Unhealthy, some sexual risk, high stress. Parent status 4 = Unhealthy, lower sexual risk, low stress.

[6] Male is the reference category.

[7] $4^{th}$ grade is the reference category at baseline, and $5^{th}$ grade is the indicator value.

[8] Less than a high school diploma or GED is the reference category.

[9] $0-499 is the reference category.
[10] Other employment status (e.g. student, unemployed) is the reference category.
[11] No steady partner is the reference category.
[12] Never or a few times a year is the reference category.
[13] None is the reference category.
[14] Not at all true is the reference category.
[15] "Parent" includes biological, adoptive, and step-parents.
[16] The parent or guardian participating in the program, not necessarily the child's biological parent, was a teen parent.
[17] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.
[18] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.
[19] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.
[20] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.

**Table A.20: The Effect of Interactions Between Intervention Type, Parenting Practices, and Children's Health Lifestyles[1] on Parents' Health Lifestyle Status[2] Membership Probabilities, Using a Random Effects Model with Maximum Likelihood Estimation (Parents Matter! Data, 2001-2006)**

| | **Parent Status 4** *Healthy, lower sexual risk, moderate stress* | | **Parent Status 2** *Somewhat healthy, high sexual risk, some stress* | | **Parent Status 3** *Unhealthy, some sexual risk, high stress* | | **Parent Status 1** *Unhealthy, lower sexual risk, low stress* | |
|---|---|---|---|---|---|---|---|---|
| **Variable** | Mean | (SD) | Mean | (SD) | Mean | (SD) | Mean | (SD) |
| Intervention group[3] | | | | | | | | |
| Brief | .25 | (.17) | .09 | (.12) | -.40* | (.17) | .23 | (.17) |
| Enhanced | -.10 | (.16) | .21 | (.11) | -.02 | (.16) | -.02 | (.16) |
| Site[4] | | | | | | | | |
| Atlanta | .03 | (.03) | .01 | (.01) | -.07* | (.03) | .03 | (.03) |
| Little Rock | -.03 | (.03) | .01 | (.01) | .02 | (.03) | .01 | (.03) |
| Child status 2[5] | -.08* | (.04) | .02 | (.02) | .03 | (.04) | .02 | (.04) |
| Child status 3 | -.02 | (.02) | .02 | (.02) | -.01 | (.02) | .02 | (.02) |
| Child status 4 | -.04 | (.03) | .00 | (.02) | .03 | (.03) | .02 | (.04) |
| Female[6] | -.08 | (.07) | .00 | (.03) | .13* | (.07) | -.07 | (.07) |
| Parent age | .00** | (.00) | .00*[20] | (.00) | -.01*** | (.00) | .00 | (.00) |
| Education[7] | | | | | | | | |
| High school diploma/GED | | | | | | | | |
| Some college | .03 | (.03) | -.01 | (.01) | -.10** | (.03) | .08* | (.03) |
| AA/technical degree | .06 | (.04) | .00 | (.01) | -.20*** | (.04) | .14*** | (.04) |
| College degree or | .12** | (.04) | .00 | (.02) | -.20*** | (.04) | .08 | (.04) |
| higher | .16*** | (.05) | -.01 | (.02) | -.23*** | (.04) | .07 | (.05) |
| Monthly family income[8] | | | | | | | | |
| $500-999 | .00 | (.01) | -.01 | (.01) | .01 | (.01) | .00 | (.01) |
| $1000-1999 | .01 | (.01) | .00 | (.01) | -.02 | (.01) | .00 | (.01) |
| $2000+ | .01 | (.02) | .00 | (.01) | -.02 | (.02) | .00 | (.02) |
| Employment[9] | -.02 | (.01) | .02 | (.01) | -.02 | (.01) | .03* | (.01) |
| Part-time | -.01 | (.01) | .00 | (.01) | -.02* | (.01) | .03** | (.01) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Full-time | | | | | | | | |
| Family structure[10] | | | | | | | | |
| Steady partner | -.01 | (.01) | .01 | (.01) | .00 | (.01) | -.02 | (.01) |
| Cohabiting | -.03* | (.01) | .02 | (.01) | -.02 | (.01) | .02 | (.01) |
| Married | -.03 | (.02) | .02 | (.01) | -.01 | (.02) | .01 | (.02) |
| Age of sexual debut[11] | | | | | | | | |
| 13-15 | -.03 | (.05) | -.03 | (.02) | .00 | (.05) | .07 | (.06) |
| 16-17 | -.03 | (.06) | -.03 | (.02) | -.01 | (.05) | .09 | (.06) |
| 18+ | .00 | (.06) | -.02 | (.02) | -.01 | (.06) | .04 | (.06) |
| Birth control first sex | .02 | (.03) | -.01 | (.01) | -.05 | (.03) | .04 | (.03) |
| Condom use first sex | .07* | (.03) | .01 | (.01) | -.06* | (.03) | -.02 | (.03) |
| Believes it's his/her job to teach child about sex | .01 | (.01) | -.04*** | (.01) | .01 | (.01) | .01 | (.01) |
| Religious attendance[12] | | | | | | | | |
| Once or twice a month | -.02 | (.01) | .00 | (.01) | .01 | (.01) | .00 | (.01) |
| Once a week or more | -.01 | (.01) | .01 | (.01) | .00 | (.01) | .01 | (.01) |
| Believes religion is very important | .02* | (.01) | -.01 | (.01) | -.02 | (.01) | .01 | (.01) |
| Child's parent[13] | .03*** | (.01) | .00 | (.01) | .00 | (.01) | -.03*** | (.01) |
| Was a teen parent | .06 | (.03) | .00 | (.01) | -.05 | (.03) | -.01 | (.03) |
| Monitoring: C[14, 15] | .00 | (.01) | .01 | (.01) | .00 | (.01) | -.02 | (.01) |
| Monitoring: P[16] | .02 | (.02) | -.03** | (.01) | .03 | (.02) | -.01 | (.02) |
| Quality: C[17] | .01 | (.02) | .01 | (.02) | -.03 | (.02) | .00 | (.02) |
| Quality: P | .00 | (.03) | .00 | (.02) | -.12*** | (.02) | .14*** | (.03) |
| Communication: C[18] | .04* | (.02) | .00 | (.01) | -.02 | (.02) | .00 | (.02) |
| Communication: P | .01 | (.02) | .00 | (.02) | .02 | (.02) | -.04 | (.02) |
| Responsiveness: C[19] | -.04 | (.02) | .01 | (.02) | .02 | (.02) | .03 | (.03) |
| Responsiveness: P | .08* | (.03) | .01 | (.03) | -.08* | (.03) | .00 | (.03) |
| Child status 2 x | -.01 | (.05) | .01 | (.03) | -.03 | (.05) | .03 | (.05) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Intervention | .03 | (.05) | -.01 | (.03) | .00 | (.05) | -.03 | (.05) |
| Brief | | | | | | | | |
| Enhanced | | | | | | | | |
| Child status 3 x Intervention | | | | | | | | |
| Brief | .02 | (.03) | .00 | (.03) | -.02 | (.03) | -.03 | (.03) |
| Enhanced | -.01 | (.03) | -.03 | (.02) | .03 | (.03) | .00 | (.03) |
| Child status 4 x Intervention | | | | | | | | |
| Brief | .00 | (.05) | .02 | (.03) | .00 | (.05) | -.03 | (.05) |
| Enhanced | -.02 | (.05) | .02 | (.03) | -.03 | (.05) | -.02 | (.05) |
| Monitoring: C x Intervention | | | | | | | | |
| Brief | -.01 | (.01) | -.02 | (.01) | .01 | (.01) | .02 | (.01) |
| Enhanced | -.01 | (.01) | .00 | (.01) | .00 | (.01) | .01 | (.01) |
| Monitoring: P x Intervention | | | | | | | | |
| Brief | .01 | (.02) | .03 | (.02) | -.05* | (.02) | .00 | (.02) |
| Enhanced | -.01 | (.02) | .03 | (.02) | -.03 | (.02) | .02 | (.02) |
| Quality: C x Intervention | | | | | | | | |
| Brief | -.05 | (.03) | -.01 | (.03) | .02 | (.03) | .04 | (.03) |
| Enhanced | -.04 | (.03) | -.03 | (.02) | .04 | (.03) | .05 | (.03) |
| Quality: P x Intervention | | | | | | | | |
| Brief | .07 | (.04) | -.05 | (.03) | .11* | (.04) | -.17*** | (.05) |
| Enhanced | .07 | (.04) | -.01 | (.03) | -.03 | (.04) | -.03 | (.04) |
| Communication: C x Intervention | | | | | | | | |
| Brief | -.01 | (.02) | .03 | (.02) | .01 | (.02) | -.06* | (.03) |
| Enhanced | -.05* | (.02) | .01 | (.02) | .03 | (.02) | .00 | (.02) |
| Communication: P x | .01 | (.03) | .00 | (.02) | -.05 | (.03) | .04 | (.03) |
| Intervention | .03 | (.03) | .00 | (.02) | -.05 | (.03) | .01 | (.03) |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Brief | | | | | | | | |
| Enhanced | | | | | | | | |
| Responsiveness: C x Intervention | | | | | | | | |
| Brief | .02 | (.03) | -.02 | (.03) | -.02 | (.03) | .02 | (.03) |
| Enhanced | .05 | (.03) | .00 | (.03) | -.02 | (.03) | -.04 | (.03) |
| Responsiveness: P x Intervention | | | | | | | | |
| Brief | -.13** | (.04) | -.02 | (.04) | .14** | (.04) | .00 | (.05) |
| Enhanced | .00 | (.04) | -.09** | (.04) | .07 | (.04) | .01 | (.05) |
| Constant | -.30 | (.16) | .06 | (.09) | 1.22*** | (.16) | -.03 | (.17) |
| Observations | 3386 | | 3386 | | 3386 | | 3386 | |
| Groups | 972 | | 972 | | 972 | | 972 | |
| Log-likelihood | -380.75 | | 1359.08 | | 412.91 | | 269.02 | |
| Sigma_u | .36 | (.01) | .10 | (.00) | .34 | (.01) | .36 | (.01) |
| Sigma_e | .14 | (.00) | .14 | (.00) | .14 | (.00) | .15 | (.00) |
| Rho | .86 | (.01) | .34 | (.02) | .85 | (.01) | .86 | (.01) |

* = $p \leq .05$, ** = $p < .01$ , and *** = $p < .000$

[1] Children's health lifestyles were determined by using latent transition analysis on the following health behaviors: eating fruits and vegetables daily, consuming dairy products daily, eating breakfast daily, getting physical activity daily, drinking alcohol, using tobacco, using drugs, fighting, getting into trouble with the police, having willingly touched or been touched under clothing by a boyfriend or girlfriend, and believing he/she should wait until he/she is older to have sex. Child status 1 = Healthy and low-risk. Child status 2 = Unhealthy and high-risk. Child status 3 = Unhealthy and low-risk. Child status 4 = Healthy and high-risk.

[2] Parents' health lifestyle statuses were determined using latent transition analysis on the following health behaviors: eating at least five fruits and vegetables a day; reading nutrition labels; baking, broiling, or grilling instead of frying; exercising for at least 20 minutes a day three times a week; having two or more sexual partners in the past six months; high-risk birth control use; high-risk condom use; believing teens should know how to use birth control before having sex; believing teens should know how to use condoms before having sex; feeling nervous or stressed; and feeling able to handle life events.

[3] The General Intervention is the reference category.

[4] Athens is the reference category.

[5] Child status 1 is the reference category.

[6] Male is the reference category.

[7] Less than a high school diploma or GED is the reference category.

[8] $0-499 is the reference category.
[9] Other employment status (e.g. student, unemployed) is the reference category.
[10] No steady partner is the reference category.
[11] Age 12 or younger is the reference category.
[12] Never or a few times a year is the reference category.
[13] "Parent" includes biological, adoptive, and step-parents.
[14] "C" stands for the parenting practice from the child's perspective.
[15] Parental monitoring, ranging from 1-4, includes knowing where the target child goes when he/she is not home, what he/she is doing, when he/she will return, and the company he/she is keeping when away from home.
[16] "P" stands for the parenting practice from the parent's perspective.
[17] The exact questions for relationship quality, ranging from 1-3, for parents and children differ somewhat, but generally speaking they cover topics such as feeling understood, feeling loved, trusting the other person, having fun with the other person, and feeling comfortable talking with the other person.
[18] Parent-child communication, ranging from 1-3, examines the actual content of parent-child communication. It includes questions about general health topics (eating right, exercising), delinquency behaviors (drinking, doing drugs), relationships (dating), sexual development (puberty, menstruation), the definition of sex, abstinence, reproduction, birth control, peer pressure, condoms, and HIV.
[19] Parental responsiveness, ranging from 1-2, measures parents' comfort level speaking with their children about sex, including how prepared they feel to talk about sex and the emotions they would feel while speaking about sex with their children.
[20] Age is positively associated with membership in health lifestyle status 4, but the number is to small to be captured when rounding to the hundredth decimal place.

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