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Marissa Koven April 6, 2015

Influences on Mindset: Exploring Personality Traits, Parenting Behaviors and Locus of Control

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An abstract of
a thesis submitted to the Faculty of Emory College of Arts and Sciences
of Emory University in partial fulfillment
of the requirements of the degree of
Bachelor of Arts with Honors

Department of Psychology

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Abstract

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Beliefs about the changeability of one's traits have major implications for psychological health, and thus it is incredibly important to examine what factors may influence the development of such beliefs. The present study examined the influences of personality traits, parental behaviors, and the role of locus of control (LOC) as a moderator. Past research has focused on the influence of mindset and ways to change beliefs, but influences on its development have been largely unexplored. A sample of 83 college students participated in this study; 38 participated in the control condition and 45 in the experimental condition. The experimental condition frustrated participants using a manipulation of the Ravensburger jigsaw puzzle. Mindset was measured using average scores on a series of Carol Dweck's Implicit Theory Questionnaires. Three measures of each personality trait were obtained using average scores on the Big Five Aspects Scale (BFAS). Parenting behaviors of care and control were measured using the Parental Bonding Instrument (PBI). Results were obtained by conducting bivariate correlations, and simple and multiple linear regressions. Degree of mother control was found to predict beliefs about the changeability of intelligence. The more maternal control perceived, the more likely participants were to believe that intelligence is changeable. Contrary to predictions, more individuals with authoritarian parents held beliefs in the changeability of intelligence than those with authoritative or permissive parents. The combination of high extraversion, conscientiousness and openness may indicate greater belief in changeability. Higher neuroticism was predictive of lower overall mindset and intelligence specific beliefs in changeability. Locus of control was also found to moderate the relationship between neuroticism and mindset about intelligence and agreeableness and mindset about intelligence. For internal individuals, beliefs in the changeability of intelligence may also predict degree of frustration obtained from failure on a task. Implications and future directions are discussed.

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There are two distinct core beliefs that people have about the changeability of highly valued personal attributes like personality, moral character, and intelligence. The overarching conceptual term for beliefs about changeability is malleability. These core beliefs stem from people's "theories" about themselves, other people and the world around them. Some people see things as changeable, reflecting a *core belief in changeability (CBC).* Others see them as unchangeable reflecting a *core belief in unchangeability (CBU).* Your framework of thinking establishes your *mindset*, either CBC or CBU. For instance, believing in the merit of our judicial system reflects a CBC because that means that you believe that an offender's moral character can be reformed through prison. On the other hand, a person may break up with their significant other upon realizing that they have incompatible personality traits because they have a CBU about personality and do not think their partner can change. People also sometimes believe that some traits are more changeable than others. For instance, the same person may have a CBC mindset about moral character, but a CBU mindset about personality.

The focus of this research is on people's beliefs about changeability. How do these beliefs affect our thinking and behaviors? Why is it that when faced with failure some people bask in the challenge and work to improve, while others simply give up? How do people come to form a mindset in the first place? Many of these questions have been studied in children and adolescents, but not in older populations and so, in the current study, I propose the examination of such questions in college students.

Throughout this introduction, I will elaborate on these core beliefs about changeability through discussion of findings from past research. First, I will discuss the two different frameworks of thinking, and explain how each outlook influences thinking about failure and what the implications are for the psychological health of individuals who hold those beliefs. I

will start with CBUs and then move onto CBCs. Then, I will discuss two possible influences on the formation of a mindset: personality and parenting style. A statement of the problem and an overview of the current study and how it will address the problem, will follow these literature reviews. The introduction will conclude with the operationalization of my hypotheses.

Core Beliefs. Core beliefs create a framework through which people interpret reality (Dweck, Chiu, & Hong, 1995). They influence attributions and appraisals of situations, problem orientation, choice of coping strategies, and thus [behavior] (Dweck et. al., 1995; Hong, Chiu, Dweck, Lin & Wan, 1999). Belief in changeability is a domain-specific conceptual framework, which explains why a single person can believe that personality is an unchangeable trait, but that moral character is changeable (Dweck, et. al., 1995).

Beliefs about the changeability of intelligence is of primary concern to the current study, and so it will be the primary focus of this discussion. For instance, individuals with a CBU about intelligence assume that while "people can learn new things, their underlying intelligence remains the same," but individuals with a CBC believe that intelligence is cultivated and that through effort they can become more intelligent (Dweck et. al., 1995). Those people with CBUs also rely heavily on traits as explanations for behaviors while those with CBCs take more event dependent factors like "needs, goals, intentions, emotional states [and] prior behavior into account to help explain outcomes and behaviors (Dweck et. al., 1995). In the event of an achievement failure, those individuals with a CBU about intelligence are more likely to blame their intelligence on the downfall while individuals with a CBC would account for their failure in terms of their effort or strategy (Dweck et. al. 1995). What someone attributes to their failure will impact how they think about the situation and how they cope.

Those individuals who have a CBU about their traits are at greater risk for developing

psychopathology, including depression (Yeager, Trzesniewski, & Dweck, 2013), than people with a CBC. Having CBUs can lead to global trait judgments (Dweck et.al., 1995). Since these people believe that their internal qualities dictate their actions and are unchangeable, they require constant reaffirmation that their abilities are sufficient. When they instead find evidence to the contrary, they feel helpless and resort to maladaptive coping styles (Doron, Stephan, Boiche & Le Scanff, 2009). Rigid and irrational thinking may lead to a negative problem orientation in which problems are viewed as personally threatening, cause a lack of self-efficacy and possible inhibition or feelings of overwhelm in problem situations (Weis, 2013, p.513). Negative problem orientation results in negative appraisals of situations, maladaptive coping and feelings of helplessness (Hong et al., 1999).

On the contrary, individuals with CBCs are more likely to view failure as a challenge and thus, have positive problem orientations (Weis, 2013, p. 513) and display flexible and adaptive coping strategies (Doron et. al., 2009). Having the self-efficacy to overcome problems leads to more positive appraisals of disappointing situations, which explains why individuals with CBCs apply greater effort or take remedial action to improve future outcomes (Hong et al., 1999). Having a CBC protects against the development of psychopathology. Because of the destructive effect unchangeable beliefs can have, learning what factors lead to holding such beliefs is imperative in creating preventative methodology to promote CBCs at an early age. The current research seeks to explore personality traits and parenting styles as possible influences on mindset, in particular, beliefs in the changeability of intelligence.

Beliefs about Changeability and Personality. One factor that may influence beliefs about changeability is personality. While much research exists on beliefs about the changeability of personality, there is little research on the influence of personality traits on those beliefs.

Personality can be divided into neuroticism, extraversion, openness/intellect, conscientiousness and agreeableness according to the Five Factor Model of personality (McCrae & Costa, 1987; DeYoung, Quilty, & Peterson, 2007). Tellegen defines a trait as "a psychological (therefore) organismic structure underlying a relatively enduring behavioral disposition, i.e., a tendency to respond in certain ways under certain circumstances" (Roberts & DelVecchio, 2000). Beliefs about changeability also predict enduring behavioral dispositions, especially reactions to failure. Both personality traits and beliefs about changeability guide behavior through their impact on cognitive processes. Research has been able to link personality traits and beliefs about changeability, by studying coping strategies.

Doron et. al. (2009) studied undergraduates coping with examinations and looked at the relationships between coping strategies, beliefs in the changeability of ability in class and their perceived control over examinations. The researchers found that those students with CBCs about their ability were more likely to use problem-focused strategies, including active coping and planning, and adaptive emotion-focused coping like venting of emotions and seeking out of social support. On the contrary, students with CBUs were less likely to use the problem-focused strategies of active coping and acceptance and were more likely to use maladaptive emotion-focused coping, specifically behavioral disengagement. Doron et. al. (2009) links maladaptive coping to CBUs and adaptive coping to CBCs.

Research conducted on the relationship between personality, stress and coping links certain personality traits to specific coping strategies. Earlier work on personality and coping focused on neuroticism and extraversion from Esyneck's theory of personality traits. Researchers consistently found that those people high in neuroticism are passive and engage in less effective coping strategies, while those people high in extraversion use active coping strategies, a part of

problem-focused coping where individuals directly tackle the stressor. Later research found that high conscientiousness also leads to active coping and planning as cited by Vollrath and Torgersen (2000). Vollrath and Torgersen studied specific combinations of neuroticism, conscientiousness and extraversion to better understand how personality traits interact to affect how people experience and manage stress. They found that by combining low neuroticism with high conscientiousness, people were best able to cope with stress while those individuals with high neuroticism and low conscientiousness were particularly vulnerable to stress and ineffective at coping. Extraversion's role was less consistent. In the former combination, extraversion further enhanced the positive aspects of the pair while it had little effect in protecting against the latter combination of negative traits.

Carver and Connor-Smith's review of personality and coping research complement earlier findings (2010). They also found that extraversion combined with conscientiousness leads to more effective coping. By expanding their meta-analysis to include all five of the Big Five personality traits, they found that openness also contributes to helpful coping strategies. In total, they link extraversion, conscientiousness, and openness to more engagement coping, a combination of problem-focused and adaptive emotion-focused strategies. Their meta-analysis also found an association between neuroticism and disengagement coping, which includes those maladaptive emotion-focused strategies linked in earlier research. Additionally, less disengagement coping was linked to conscientiousness and agreeableness (Carver & Connor-Smith, 2010).

Together, research on core beliefs about changeability and coping styles and personality traits and coping styles provide a bridge connecting core beliefs about changeability to personality. Since CBCs tend to lead to engagement coping, and engagement coping is enhanced

by extraversion, conscientiousness and openness, these personality traits may influence the emergence of CBC mindsets. Similarly, since CBUs are linked to disengagement coping, which is enhanced by neuroticism, a greater degree of neuroticism may indicate CBUs. Lower levels of conscientiousness and agreeableness may also indicate CBCs since they reduce disengagement coping.

Beliefs about Changeability and Parenting Style. Because parents are able to influence the way their children think, parenting style may influence children's beliefs about changeability. For the last century, research on parenting practices and their functional and psychological consequences for offspring has been a prevalent topic as it has supported the idea that parenting practices play a large role in influencing children's psychological health and behaviors. McGinn, Cukor, and Sanderson's study on the relationships between parenting style, cognitive style and anxiety and depression confirms previous findings of "significant associations between parenting and psychopathology, between psychopathology and cognitive style, as well as between parenting and cognitive style" (2005). Frome and Eccles (1998) support an earlier finding that parental perceptions of children's ability in math and English are a stronger predictor of children's self-perceptions of their ability than their children's grades. Children do not use reality (grades) itself to determine their self-perceptions of ability, but instead, allow parents' perceptions of them influence their interpretation of reality, which then determines their self-perceptions.

Children's self-perceptions are also very important in determining their future performance in school. Henderson and Dweck (as referenced in Dweck et. al., 1995) found that children's beliefs about the changeability of their intellectual abilities predict their future performance in school over what would be expected based on past performance. For instance,

students with CBUs, whether they earned high or low grades in 6th grade, earned low marks in 7th grade, while those students with CBCs continued to earn high grades in 7th grade or performed better than in 6th grade if they had previously been earning low grades. In another study in which students were provided with hypothetical achievement setbacks, students with CBUs were more likely to express negative affect and helpless coping reactions including escapism than students with CBCs who devised mastery-oriented strategies and planned to be more effortful in the future (Dweck et. al. 1995). This study reflects how in the event of achievement setbacks, students with CBUs respond helplessly. They believe that the failure is a reflection of a lack of intelligence, resulting in "negative self-judgments, negative affect, a lack of persistence, and performance decrements" as found in additional studies by Diener and Dweck (as referenced in Dweck et. al. 1995). Individuals with CBUs create a self-fulfilling prophecy of failure for themselves. Individuals with CBCs, on the other hand, respond to achievement failure with a mastery-oriented pattern "characterized by a focus on effort and strategies," persistence and "generation of new problem-solving strategies (Dweck et. al. 1995).

From these studies it can be concluded that parental perceptions of children's abilities influence children's perceptions of their abilities, which in turn influence academic performance. Pomerantz and Dong (2006) exemplified the link between parents' perceptions of children's ability and children's performance. When mothers have CBU mindsets, a self-fulfilling prophecy arises in which parental perceptions of children's academic competence accurately predicts children's achievement and overall affective functioning (ie: self-esteem and depressive symptoms) (Eccles, 1983; Pomerantz & Dong, 2006). Eccles (as cited by Frome & Eccles, 1998) suggested that parents may indicate their perceptions by communicating "causal attributions" of their children's performance or "by encouraging or discouraging particular activities." For

parents who view competence as relatively fixed, and perceive their children as lacking academic talent, they may redirect their children to focus on other skills, such as music or sports, that their children have proven to be more competent in (Frome & Eccles, 1998; Pomerantz & Dong, 2006).

Parents' own "theories about the stability of competence has shaped their cognitive, affective, and behavioral responses to both their own competence as well as" their children's, as cited by Pomerantz and Dong (2006). Parents who redirect their children display and promote a CBU mindset by sending the message that their child's academic competence is unchangeable. If they believed that their child could become more intelligent, they would support efforts to improve. The existence of self-fulfilling prophecies in children of mothers with CBUs and their tendency to redirect children's focus based on perceived unchangeable competencies, support the claim that parents transfer their CBUs to their children by modeling such thinking. Parents teach their beliefs in many ways, intentionally, unintentionally, verbally and through actions. No matter how parental beliefs are transferred, they influence the way their children think about themselves and their abilities.

Another way parents may influence their children's beliefs about changeability is by emphasizing certain goals for their children. There are performance-oriented goals, in which the aim is to attain a desired result by out-performing others or through exertion of little effort, and mastery-oriented goals, in which the focus is on learning and developing new skills competently through effort (Ames & Archer, 1987). Mothers who hold performance goals for their children are primarily concerned with demonstration of competence rather than effort, demonstrating their own CBUs and promoting such thinking in their children. Those mothers who instead hold mastery goals for their children focus on children's effort in developing competence (Pomerantz,

& Dong, 2006), as individuals with CBCs do, and teach their children that their abilities can be improved on. Dweck and colleagues linked performance goals to CBUs and mastery-oriented goals to CBCs when they assessed children's preferences for performance versus learning goal tasks. They found that children with CBUs preferred performance goal tasks, which assured their intelligence competencies, over learning tasks while those with CBCs favored learning goal tasks (Dweck et. al., 1995).

Just as children's beliefs about changeability direct their behavior, parent's beliefs about changeability direct their behaviors and thus parenting strategies. Parenting strategies have been categorized into the widely accepted styles of authoritative, authoritarian, indulgent and uninvolved (Weis, 2013; Darling, 1999; Baumrind, 1991). These classifications are based on levels of parental demandingness and responsiveness. Demandingness refers to the "degree to which parents have age-appropriate expectations for their children's behavior, clearly establish and consistently enforce rules governing their behavior, and supervise their children" (Weis, 2013, p.49) and it "is associated with instrumental competence" (ie: academic performance) "and behavioral control" (i.e. reduced deviance) (Darling, 1999). Responsiveness is the "degree to which parents display warmth and acceptance toward their children, correct their behavior to meet their children's needs in a sensitive and responsive fashion, and engage their children through shared activities and positive emotions" (Weis, 2013, p.49) and it "predicts social competence and psychosocial functioning" (Darling, 1999). Authoritative parenting is marked by high levels of both demandingness and responsiveness. Authoritarian parents are also very demanding, but exhibit low levels of responsiveness. Indulgent parenting involves high levels of responsiveness, but low levels of demandingness. Lastly, uninvolved parents are neither demanding nor responsive (Weis, 2013, p.49).

The impact that parenting has is both widespread and pervasive. Authoritative parenting has been consistently shown to be the most effective parenting style. Children raised in such an environment tend to perform well in school and are socially competent (Darling, 1999). Though these parents set high expectations of responsibility, self- regulation and cooperation, they also provide adequate support, using discipline as a support rather than as a punitive punishment to help their children meet those expectations (Weis, 2013, p.49; Baumind, 1991). Authoritative parenting seems to demonstrate CBCs and lends itself to promoting mastery-oriented goals. These parents hold high academic and social expectations for their children and therefore endorse learning and the development of competence. In instances of failure, these parents would be less likely to redirect their children's focus. Instead, they would support their child, encouraging them to exert greater effort in the problematic task in order for them to eventually succeed and reach the goals that have been set for them.

On the other hand, authoritarian parents set high expectations, including the unquestioned acceptance of their rules (Darling, 1999), and are highly involved in their children's lives, but do not provide the necessary support and encouragement necessary to meet those expectations (Weis, 2013, p.49). Children in these homes tend to perform moderately well in school and are well behaved, but have poorer social skills, lower self-esteem and are at higher risk for developing depression (Darling, 1999). Authoritarian parents may have more performance-oriented goals; they expect results, but may not value the process. When their children fail to meet expectations, they use high psychological control such as "guilt induction, withdrawal of love, or shaming" (Darling, 1999) to manipulate their children into behaving. Due to their high involvement, they may also be more likely to redirect their children's focuses to arenas where they have shown to be more successful. Without support and encouragement, these children are

likely to internalize their difficulties as unchangeable faults and assume a CBU mindset.

Children raised in indulgent environments have greater freedom than children in other households. Their parents are very responsive, but not demanding. Instead, they are lenient, non-directive and permissive, value autonomy and exploration, and use little discipline (Weis, 2013, p. 50). As a result, children tend to have more deviant behavior and poorer academic performance, but have higher- self esteem, are socially competent and are less likely to develop depression (Darling, 1999). In these households, it is unlikely that parents teach their children to meet goals because they do not express expectations. Similarly, children with uninvolved families are not provided with structure; parental behavior is inconsistent (Weis, 2013, p. 50). Unfortunately, children with uninvolved parents have the poorest outcomes in all domains (Darling, 1999). Because of the lack of parental instruction and influence, it would be difficult to predict beliefs about changeability of children based on these parental situations.

Emerging Adulthood as the Developmental Period of Study. Most of the research on beliefs about changeability and academic performance is on children and adolescents, but does not extend to older developmental periods where the influence of beliefs about changeability is just as strong. Jeffrey Arnett has identified emerging adulthood as the transitional period of development between adolescence and adulthood. It is a time for identity exploration in the areas of love, work and worldviews (Arnett, 2000). Romantic relationships become more intimate and serious during this period (Arnett, 2000). Beliefs about changeability may play a role in the longevity of a relationship. As partners learn more about each other, they may find aspects about one another that they dislike and hope will change. Through relationships, individuals learn about the changeability of personality, leading to concrete beliefs on the subject.

During emerging adulthood, work experiences become more geared towards a future

career and encourage individuals to consider their abilities. Education provides the same kind of exploration. Throughout childhood and adolescence, ideologies about changeability are reinforced by parental behaviors and institutionally through school. Many students arrive at higher institutions from the Advanced Placement (AP) or International Baccalaureate (IB) tracks expecting to easily maintain their high GPAs. Receiving their first "C" may challenge their beliefs about their intelligence and they will respond in either a pattern characteristic of having a CBC or CBU. Failures and successes in college influence the choice of major and eventual occupational decisions. Educational resources, mental health resources and peer support, all available in college, may in turn challenge an individuals beliefs about changeability.

Beliefs about changeability are further challenged during emerging adulthood through challenges to their worldview. Arnett (2000) cites evidence that higher education promotes explorations and reconsiderations of worldviews. Research has shown that emerging adults find it "important during emerging adulthood to reexamine the beliefs they have learned in their families and to form a set of beliefs that is the product of their own independent reflections, as cited by Arnett (2000). Emerging adults are not only exposed to differing belief systems during this period of time, but they are also open to new ideas. Emerging adulthood is clearly a time in which beliefs about changeability play an important role.

Statement of the Problem. Beliefs about changeability have been researched in children and adolescents, but not a lot of research exists in emerging adulthood, a time when beliefs about changeability become established and continue to influence behaviors. This study seeks to investigate how beliefs about changeability are expressed in emerging adulthood and what factors may have influenced its development. This study extends research from children to college students and adds the measurement of personality to experiments conducted on beliefs

about changeability.

Overview of Current Study. It is likely that both children's personality traits and the parenting style they were exposed to growing up influences children's mindset. The relationship between parents and children is bi-directional, as found by Ginsburg & Schlossberg (as cited in Weis, 2013, p. 379). Just as parents model and reinforce their children's behaviors, children also elicit specific responses from their parents. Because of the many factors that go into parent-child interactions, it is possible that personality mediates or moderates the relationship between parenting style and development of mindset or that parenting style mediates or moderates the relationship between personality and mindset development. It is also possible that these two factors influence the development of mindset separately. The relationships between individuals' personalities, perceived parenting styles and current beliefs about changeability is of primary concern to the current study. The effect of experiencing failure on beliefs about changeability is also of interest to the researchers. Since most evidence for a given mindset comes from response to failure, the researchers decided to expose participants to such a situation and record its impact on perception of trait changeability. Typical measures for mindset ask participants about their beliefs about the changeability of personality and intelligence without providing a reference point. This study provides a specific experience of failure to think about to see if beliefs about changeability depend on emotional state.

Hypotheses:

(1) It is hypothesized that measure of overall mindset will be associated with greater frustration.

   a. Specifically, overall mindset scores, an indication of core beliefs about changeability, will be lower when individuals have a higher frustration score,

indicating that greater frustration will create a CBU mindset.

(2) It is hypothesized that measure of overall mindset will be associated with parenting style.

   a. Specifically, lower scores on overall mindset will be associated with authoritarian parenting, based on high scores of parental control. This would indicate that authoritarian parenting is associated with a CBU mindset. (Pomerantz & Dong, 2006; Dweck et.al., 1995)

   b. Specifically, high scores on mindset will be associated with authoritative parenting style, based on high care and moderate parental control scores. This would indicate that authoritative parenting is associated with a CBC mindset. (Pomerantz & Dong, 2006; Dweck et.al., 1995)

(3) It is hypothesized that personality trait scores will be associated with overall mindset scores.

   a. Specifically, high scores on measure of overall mindset will be associated with higher scores of openness, extraversion and conscientiousness, especially in combination, and with the combination of higher scores on conscientiousness and agreeableness. This would indicate that higher levels of openness, extraversion, conscientiousness and agreeableness are associated with CBC mindsets. (Carver & Connor-Smith, 2010; Doron et.al., 2009)

   b. Specifically, higher scores of neuroticism will be associated with lower scores on overall mindset. This would indicate that neuroticism is associated with a CBU mindset. (Carver & Connor-Smith, 2010; Doron et.al., 2009)

Exploratory Hypotheses

(1) Should hypothesis two and three be supported, it is further hypothesized that personality mediates the relationship between perceived parenting style and beliefs about changeability. That is, personality scores on those traits found to be significant in earlier analyses will predict parenting style (parental care and control scores), which in turn will predict observed beliefs about changeability (scores on overall mindset).

(2) Alternatively, it is hypothesized that personality (scores on personality trait scales) moderates the relationship between perceived parenting style (parental care and control scores) and beliefs about changeability (overall mindset score). Thus, the relationship between perceived parenting style and observed beliefs about changeability will differ at high or low levels of personality traits.

(3) It is hypothesized that locus of control will be associated with and moderates the relationship between variables of interest.

Method

Participants

A sample of 83 undergraduates was recruited from the Emory University Psychology student research pool to participate in an exploratory study assessing personality traits and parenting styles as possible influences on mindset. Students taking introductory classes in Psychology are required to engage in 6-8 hours of study participation in order to learn about study design and implementation. Undergraduates interested in participating in the study signed up through the SonaSystems online record.

The sample was consistent with expectations for an introductory psychology course. The

sample consisted of 25.6% male and 74.4% female participants, reflecting that the majority of introductory psychology courses tend to be female. Introductory classes also tend to contain mostly underclassmen: 51.2% of the sample was freshmen, 34.1% sophomores, 11.0% juniors and 3.7% seniors. The ages of the undergraduates ranged from 17- 21years (M= 19.09, SD= 1.33). GPA scores at time of assessment ranged from 2.0 - 4.485 (M= 3.43, SD= 0.45) (first semester freshmen indicated their overall GPAs in High School). The ethnic diversity level of participants was, however, representative of the university as a whole with a distribution of 45.1% Caucasian, 11.0% African American, 8.5% Hispanic, 28.0% Asian, and 7.3% other nationalities, including mixed race, Indian, Egyptian and Iranian. The socioeconomic status distribution revealed that the sample contained students from 7.3% working class, 6.1% lower middle class, 22.0% middle class, 41.5% upper middle class and 22.0% upper class families.

There was no exclusion criteria for the current study; all Emory students who expressed interest in participating were allowed to enroll.

Procedure

Participants came to the Personological and Cognitive Literary Studies Lab in room 420 of the PAIS building. Participants were asked to sign in and complete informed consent, at the researcher's request, before continuing with the study. The study consisted of a two-part experimental task and subsequent online questionnaires, all of which was recorded on the online questionnaire through Qualtrics. Participants were assigned to either the control task group (where they were given a selection of questions of mixed difficulty from the "Reading the Mind in the Eyes" test) or the experimental group (where they were asked to complete as much of a jigsaw puzzle as they could in 5 minutes).

Before and after initial completion of the task, participants filled out a mood scale. The

task was followed by questions about their performance, training on the task, and another mood scale before completing the task a second time. Following the completion of the task, participants were again asked questions about their performance before they had the opportunity to take a break; snacks were provided. Afterwards, participants filled out a series of self-report questionnaires including the Big Five Aspects Scale (BFAS), Parental Bonding Instrument (PBI), Implicit Personality Theory Questionnaire (self and others), Implicit Theories of Intelligence Questionnaire, Nowicki-Srickland Internal-External Control Scale-Form C, and Marlowe-Crowns Social Desirability Scale (M-C SDS). After completion of the online survey, participants were debriefed. The study took about 45 minutes to complete.

Measures

Mindset. The Implicit Personality Theory Questionnaire (self-form) (Erdley & Dweck, 1993; Hong et al., 1999) is a four item self- report questionnaire used to assess mindset by inquiring about individuals beliefs about the changeability of personality with questions such as "Your personality is something about you that you can't change very much." Participants rated statements on a 6- point Likert-scale (1 = Strongly Disagree to 6 = Strongly Agree). High scores are indicative of a CBC mindset and low scores are indicative of a CBU mindset. The maximum score an individual can receive is 18. This scale has been used in most studies of malleability beliefs about personality (see Dweck, 1999) and has demonstrated acceptable internal consistency ($\alpha = 0.71$) and test- retest reliability ($r = 0.64$) in past research (e.g. Erderly & Dweck, 1993). In the current study it also attained good internal consistency ($\alpha = 0.87$). Dweck (1999) also created an Implicit Theories on the Personality of Others questionnaire. This was another four item scale set up exactly like the self-form. An example of a question would be "Someone's personality is a part of them that they can't change very much." This scale's internal

consistency reached $\alpha = 0.90$ in the current study. This scale was only used to create an overall mindset score for participants, but was not analyzed individually.

Additionally, Dweck created an Implicit Theories of Intelligence Questionnaire (1999). The questionnaire contains six questions, with three questions asking about CBUs such as "You have a certain amount of intelligence, and you can't really do much to change it" (reversed scored) and three questions asking about CBCs such as "No matter who you are, you can change your intelligence a lot." This questionnaire is scaled the same as the previous two and has a maximum score of 36. The internal consistency of the scale in this sample was $\alpha = 0.92$. The three mindset questionnaire scores were averaged to create a measure of overall mindset. As one measure, the questionnaires retained high internal consistency with a score of $\alpha = 0.84$.

The Ravensburger jigsaw frustration task was designed for this study to assess beliefs about changeability in relation to a specific instance of failure. Before the task, participants filled out a mood scale with ten emotions on it, including frustration. For the task, they were asked to try to connect at least 10 pieces of the all silver puzzle in 5 minutes. To increase the difficulty of the task, the border pieces were removed and participants received only half of the remaining puzzle pieces. Additionally, a verbal countdown was provided, to increase the pressure of the situation. There was time indicators at four, three, two, one minute, and thirty seconds remaining as well as the last ten seconds counted aloud. When the five minutes were up, the researcher checked the participant's work and disconnected pieces that were not true pairs. (This portion of the task was piloted to ensure frustration.) Afterwards, participants viewed a skewed bell-curve distribution believed to reveal the number of connections that those people who had already taken the study were able to attain, much like a bell-curve distribution of test scores. The bell-curve was followed by another mood scale, seven questions inquiring

about their mindset, structurally similar to the Implicit Personality Theory Questionnaire, and questions about performance. After a short training session with hints on how to improve one's strategy on the puzzle, the task was repeated followed by comparative questions on performance. The Ravensburger task was shown to significantly frustrate participants (pre mood mean score = 2.15, post mood mean score = 4.09, $p = <0.001$).

This task had two purposes. First, the objective was to act as a way to predict later mindset assessment through the comparison of participant predictions of performance before and after training. Participants anticipating greater improvement after their initial failure reflect a CBC mindset. Anticipation of little or no improvement indicates a CBU mindset. These ratings were compared to the mindset score averages to verify patterns of beliefs of changeability. The frustration task also reflected situational thinking while the Implicit Personality Theory Questionnaire and its conglomerates did not. Participants were given a specific instance of failure to apply their mindset to, rather than something general like personality.

The Ravensburger jigsaw puzzle was not the first frustration task piloted for the study. Originally, an adaptation of the "Reading the Mind in the Eyes" Test (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001) was designed to frustrate participants and gauge perceptions of ability to improve on the task. In the end, this task was used for the control group. To read more about this task see Appendix B.

Personality Traits. The Big Five Aspects Scale was used to measure personality (BFAS; DeYoung, Quilty & Peterson, 2007). The BFAS contains 100 items that are rated on a 5-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The scale was developed to measure the Big Five Personality traits (Neuroticism, Agreeableness, Conscientiousness, Extraversion, and Openness/Intellect), which it further breaks down into two facets per trait. For instance,

Neuroticism is subdivided into Volatility "e.g., Gets upset easily," and Withdrawal "e.g., Am filled with doubts about things." There are 10 items per facet. The scale scores were averaged, each subscale individually and the two together for an overall personality trait rating. The highest score a participant could receive per personality trait was 5. Higher scores indicate a greater demonstration of that trait. The BFAS has demonstrated adequate psychometric properties in previous research with Cronbach's alphas (α) ranging from .72 to .89 and test- retest correlations ranging from .73 to .86 (DeYoung et. al. 2007). In this sample, Cronbach's alphas ranged from .65 to .92 (including individual facets and full traits).

Parenting Style. The Parental Bonding Instrument was used to measure parenting behaviors as perceived by the child (Parker, Tupling & Brown, 1979). It consists of two scales: 'care' (e.g., Frequently smiled at me) with 12 items, and 'overprotection' or 'control' (e.g., Tried to control everything I did) with 13 items for a total of 25 items. Items are rated on a 4-point scale ranging from 0 (Very Unlike) to 3 (Very Like). The cutoffs for high or low care and protection are as follows: a care score of 27.0 and protection score of 13.5 for mothers and a care score of 24.0 and a protection score of 12.5 for fathers. Care and protection scores can be used to indicate specific parenting styles. High care and moderate control (designated as 1 standard deviation above and below the cutoff) indicate an authoritative parenting style; high control reflects authoritarian parenting and low or high care accompanied by low control indicates permissive parenting. The Psychometric measures were found to be acceptable for the PBI with Cronbach's alphas (α) ranging from .71 to .82 and mean inter-item correlations falling within the acceptable recommended range with scores ranging from .37 to .51 (Tsaousis, Mascha, & Giovazolias, 2012). In this sample, Cronbach's alphas ranged from .73 to .92 (including both the full scales and individual care and control scales for each parent).

Locus of Control. The Nowicki-Strickland Internal-External Control Scale – Form C (Nowicki & Duke, 1974) was used to compare beliefs about changeability and test LOC as a moderator. This 40-item scale asks participants to rate statements about personal control to which participants answer yes or no. An example item reads "Most of the time do you feel you can change what might happen tomorrow by what you do today?" Participants receive 1 point for every choice they choose that indicates an external locus of control and 0 points for internal control choices. Higher scores indicate a more external locus of control. This measure has demonstrated acceptable internal consistency in past research with Cronbach's alphas (α) ranging from .75 to .81 and test-retest reliability of r = .86 and again in the current study with Cronbach's alpha reaching α = .73.

Social Desirability. The Marlowe-Crowns Social Desirability Scale (M-C SDS; Crowne & Marlowe, 1960) measures need for approval and was used to control for social desirability. The M-C SDS contains 33 true/false questions such as "I sometimes feel resentful when I don't get my way." A person presenting social desirability would mark this question false. The scale has 18 true and 15 false answers for full social desirability. The reliability score for the scale using the Kuder-Richardson formula 20, was .88 and its test-retest correlation was .89 (Crowne & Marlowe, 1960). The internal consistency for the scale in this study was α = .77.

Potential Confounds. A number of demographic variables collected were examined as potential confounds for each of the main variables. Tables 3a-c show confounding relationships. The study's disproportionately high percentage of female participants may have been a confound. Additionally, the lack of frustration by some participants was also taken into account as a possible confound.

Results

In general, primary hypotheses 1 and 2 were not supported, but some support was found for hypothesis 3. Hypothesis 1 posited that mindset would be associated with frustration, which it was not. Hypothesis 2 postulated that mindset would be associated with parenting style. Although there was no direct correlation, there were relationships between parenting behaviors and mindset. Hypothesis 3 predicted an association between personality trait scores and mindset and discussed specific personality trait combinations. No support was found for exploratory hypotheses 1 and 2; personality was not found to be a mediator or moderator. Exploratory hypothesis 3 which predicted that LOC would moderate the relationship between personality traits and mindset about intelligence, was supported.

Primary Variables and Covariates. Prior to conducting analyses related to the study hypotheses, correlations were run to test associations between demographic factors and the main variables of the study (i.e. mindset, personality traits, parenting behaviors, and frustration) to ascertain potential confounds. Tables 3a-c provide bivariate correlations between potential confounds and the main variables. For a full explanation of these associations, see Appendix C. All significant confounds were controlled for in analyses testing the hypotheses, as specified below.

Frustration and Mindset. In order to test the hypothesis that overall mindset scores would be lower the more frustrated individuals were by failure, we conducted a series of simple linear regressions, controlling for significant confounds. Table 4 provides the results of these analyses. There was no significant change in beliefs about changeability based on level of frustration. Looking at just the experimental group, even when split into thirds, there was no significant difference in frustration between the highest CBC scores (N= 15) and lowest CBU scores (N=

15) for the mindset about personality ($p = .45$), mindset about intelligence ($p = .43$) and overall mindset groups ($p = .37$).

The experimental portion of the study also sought to predict mindset scores using Dweck's questionnaires by asking participants about their future performances. As shown in Table 5, only the question inquiring about the changeability of a certain ability, given training on a skill that would require that ability, was significantly correlated to beliefs about the changeability of intelligence (mindset about intelligence), $r (82)= .34$, $p <.01$. Figure 1 shows the relationship between the training and specific skill question and average score on intelligence changeability.

In summary, mindset was unaffected by level of frustration on the task, but mindset about intelligence was moderately correlated with the question that asked about the changeability of a certain ability, given training on a skill that would require that ability.

Parenting and Mindset. In order to test the hypothesis that parenting style predicts beliefs about changeability, we conducted a series of simple linear regressions, controlling for significant confounds. Table 6b provides the results of these analyses. It was predicted that specifically, authoritarian parenting, designated by high levels of control, would predict lower mindset scores and that authoritative parenting, indicative of high care and moderate control, would predict higher mindset scores. As shown, neither mother nor father parenting style predicted mindset. Correlational analyses were tested between parenting style and mindset as well. They can be found in Table 6a. The lack of association supports the previous regression finding.

Mean mindset scores based on parenting style were also compared via a series of one-way between subjects ANOVAs. There was a significant effect of parenting style on mindset

about intelligence at the p<.05 level for the three conditions (i.e. authoritative, authoritarian and permissive parenting) [F(2, 79) = 3.71, p = 0.029]. Further analyses showed that there was a significant difference in scores between authoritarian parenting (M=4.34 SD =1.11) and authoritative parenting (M= 3.69, SD= 1.02) conditions, t(68)= -2.20, p = .031 and a significant difference in scores between authoritarian parenting (M=4.34, SD = 1.11) and permissive parenting (M= 3.25, SD= 1.35) conditions; t(26)=2.35, p = .027. Figure 2 shows that the authoritarian condition has fewer individuals with scores at or below 3 (CBU mindsets).

In addition, parental total PBI scores (care + control) were examined. Correlational analyses revealed that mother PBI scores were significantly positively associated with mindset about intelligence (r = .26, p = .02) and overall mindset (r =.28, p = .01). Mother and father PBI scores were also moderately associated with beliefs about the changeability of personality (mindset about personality), but not significantly. Further regression analyses, as shown in Table 7, revealed that mother's total PBI score was a significant predictor of overall mindset, with confounds controlled for. Mindset about intelligence approached significance. Both mother and father total PBI scores trended towards significantly predicting mindset about personality.

After these initial analyses, additional correlations and simple linear regressions were conducted to test the impact of individual care and control scores for both parents on mindset. Tables 8a and 8b provide the results of these analyses. Mother and father care were significantly and positively associated with mindset about personality at the p< .05 level, and mother care approached significance. Father care was not a significant predictor. Control scores for mothers were significantly and positively associated with mindset about intelligence. They also trended towards significantly predicting mindset about intelligence. However, when mother control scores were broken into three levels: low, moderate and high, mother control significantly and

positively predicted mindset about intelligence ($p = .03$, $t = 2.17$, $r^2 = .23$). A series of ANOVAs revealed that there was also a significant effect of maternal control on mindset about intelligence at the $p < .05$ level for the three conditions [$F(2, 81) = 3.83$, $p=.026$]. As shown in Table 8c, the mean score for the low control condition was 3.25 (SD=1.35), for the moderate control condition 3.66 (SD=1.02) and 4.34 (SD=1.11) for the high control condition. There were significant differences in mindset about intelligence between low and high control levels ($p = 0.01$) and between moderate and high control levels ($p = .01$). Since father control was not significantly associated with mindset, no further analyses were conducted.

In summary, parenting style was not directly associated with mindset. However, mindset about intelligence was found to differ among parenting styles; the authoritarian parenting group had less participants with CBUs than the authoritative and permissive groups. Total mother PBI scores were also predictive of overall mindset and positively associated with mindset about intelligence. When broken down into care and control factors, parental care and mother control were positively associated with, but not predictive of mindsets about personality and intelligence, respectively. However, mother control, when broken into low, moderate and high levels, was positively predictive of mindset about intelligence.

Personality and Mindset. In order to test the hypothesis that higher levels of openness, extraversion, conscientiousness and agreeableness predict a CBC, we conducted bivariate correlational analyses. Tables 9a and 9b provide the results for these analyses. As shown, individually, openness, extraversion, conscientiousness and agreeableness scores were not significantly associated with mindset.

Combinational influences of personality traits on mindset were also investigated, with the findings shown in Tables 11a-e. We took the top and bottom third scores for each "overall"

personality trait to designate high and low degrees of the trait, respectively. We then looked at the number of people in each combination who had CBCs about intelligence (scores of 4.0 and above) and CBUs about intelligence (scores of 3.0 and below). The same number of CBC and CBU mindset individuals had combinations of high neuroticism with low conscientiousness, low neuroticism with high conscientiousness, high extroversion with high conscientiousness, and high conscientiousness with high agreeableness. There were, however, only mindset scores of 3.5 and above for the combination of high extraversion, high conscientiousness and high openness. There were 3 CBC mindset scores and no CBU mindset scores of the 6 individuals who had this combination of personality traits.

It was also hypothesized that higher levels of neuroticism would predict lower mindset scores. Table 10a provides the results of these analyses. First correlational analyses were conducted revealing that mindset about intelligence is significantly negatively associated with all three subsets of neuroticism (volatility, withdrawal and overall neuroticism). Regression analyses are presented in Table 10b. Overall mindset also had a significant negative association with neurotic withdrawal and overall neuroticism. The neuroticism withdrawal subscale trended towards significantly predicting overall mindset. Similarly, overall neuroticism trended towards significantly negatively predicting mindset about intelligence. However, the neuroticism withdrawal subscale significantly negatively predicted mindset about intelligence with confounds controlled for.

In summary, the only personality trait alone, to be associated with mindset was neuroticism. However, individuals with a combination of high extraversion, conscientiousness and openness did not have CBUs about intelligence. Overall mindset and mindset about intelligence were negatively correlated with multiple neuroticism scales.

Exploratory Analyses: Personality. To test neurotic withdrawal as a mediator between maternal control and mindset about intelligence, all three pairs need to be correlated. No significant association was found between mother control scores and neuroticism ($r = .06$, $p = .29$), so no further analyses assessing personality as a mediator were conducted.

Extensive analyses were conducted to test personality (neuroticism withdrawal) as a moderator between parenting behaviors (mother control) and mindset about intelligence. There were no significant findings. To read more about those specific analyses see Appendix D.

In summary, personality, in the form of neurotic withdrawal, was not found to mediate or moderate the relationship between parenting behaviors (i.e. mother control) and mindset about intelligence.

Exploratory Analyses Locus of Control (LOC). LOC was a highly correlated variable with many of the main variables of the study including, mindset about intelligence, at least one subset of each of the five personality traits, parental care and paternal control, as shown in Tables 3a-c. These correlational findings led to the conducting of additional analyses to assess the relationship between LOC and these variables. For all analyses with LOC, the data was split into thirds and the individuals with top and bottom third LOC scores were examined. Those individuals in the top third, with the highest LOC scores, were designated as externals and those in the bottom third, with the lowest scores, were considered internals.

Mean mindset about intelligence scores among internal and external individuals were examined. The effect of LOC on mindset about intelligence approached significance at the $p<.05$ level for the two groups [$F(1, 62) = 5.308$, $p = 0.058$]. Mean intelligence scores were 3.5 ($SD = 1.09$) for external individuals and 4.07 ($SD = 1.30$) for internal individuals.

In summary, LOC was associated with the main variables and the difference in mindset

about intelligence for internals and externals approached significance, with internals scoring higher on the measure of mindset about intelligence than externals.

LOC: Frustration. As reported earlier, no relationship was found between level of frustration and mindset. Exploratory analyses of simple linear regressions were run to examine LOC as a possible moderator between frustration and mindset about intelligence. When examining all of the data, no significant moderation was found in the internal, $R^2 = .026$, $t(28) = -.859$, $p = .398$, or external $R^2 = .010$ $t(32) = -.564$, $p = .576$, LOC groups. Additional analyses were run on the experimental group alone to investigate LOCs role. Participants were again split into thirds by LOC score and frustration scores among individuals with CBCs and CBUs about intelligence were compared within their LOC group. In the external group, there was no significant difference (p= 0.394) between frustration among individuals with CBCs (N=5, M =1.60), and CBUs (N=8, M = 1.13). The internal group also did not find a significant difference, but there was a practical difference in frustration depending on mindset about intelligence. Individuals with CBCs (N=10, M=2.9) were frustrated less than individuals with CBUs (N=2, M=5).

In addition, the experimental frustration group's predictions of performance before and after training were compared with mindset about intelligence based on LOC scores (N= 28). There were significant findings. T-tests revealed that individuals with external LOCs had a significantly lower mindset score about intelligence than internals (p= .007). The mean score for externals was 3.17 (SD = 1.10) and for internals was 4.31 (SD = 1.12). Externals also trended towards believing that their performance would improve less after training than internals (p=0.070). The mean change in performance expectations for externals was 8.07 and for internals 5.

In summary, LOC did not moderate frustration and mindset about intelligence across the set of all of the data, but in the experimental group, internals with CBCs were less frustrated than internals with CBUs about intelligence, though not significantly. Within the experimental group as a whole, there was a significant difference in mindset about intelligence, with externals having fewer beliefs in changeability than internals. Externals also believed that their performance would not improve with training as much as internals did.

LOC: Parenting Behaviors. As shown in Tables 3a and c, LOC is negatively correlated with mindset about intelligence as well as ratings of parental care. Additional analyses were conducted to determine if the relationship between parental care and mindset about intelligence is moderated by LOC. A series of simple linear regressions were conducted to study these relationships. As seen in Figure 3a, LOC was not found to moderate mother care (internals: $R^2 = .031$ $t(28) = -.946$, $p = .352$, externals: $R^2 = .028$ $t(32) = .955$, $p = .347$) or father care (internals: $R^2 = .026$ $t(28) = -.859$, $p = .398$, externals: $R^2 = .001$ $t(32) = -.149$, $p = .882$) and mindset about intelligence. However, for father care, there may be a difference in the influence that internal LOC has on the relationship than external LOC, as shown in Figure 3b.

Since father control scores were somewhat correlated with LOC, additional analyses were conducted to investigate LOC as a moderator between perceived father control and mindset about intelligence. Again no moderation of LOC was found. LOC did not moderate father control (internals: $R^2 = .295$ $t(24) = -.460$, $p = .649$, externals: $R^2 = .070$ $t(28) = 1.016$, $p = .318$) and mindset about intelligence. There may, however, be a difference in the influence that internal LOC has on the relationship than external LOC, as shown in Figure 3c.

In summary, LOC is negatively correlated with mindset about intelligence, parental care and father control, but it does not moderate the relationship between these variables.

LOC: Personality. As shown in Tables 3a and b, LOC was correlated with all three measures of neuroticism and mindset about intelligence so additional analyses were run to assess whether LOC moderates these relationships. As shown in Figure 4a, internal LOC approaches significantly moderating the relationship between mindset about intelligence and neurotic volatility (R^2=.461, t(22) = -2.034, p=0.054), with confounds controlled for. No such relationship exists for externals (R^2= .073, t(26) = -.721, p = .477). As shown in Figure 4b, for internals, withdrawal neuroticism trended towards significantly predicting mindset about intelligence with confounds controlled for (R^2= .458, t(22)= -2.007, p =0.057). For individuals with an external LOC, the relationship between withdrawal neuroticism and mindset about intelligence was significant, with confounds controlled for (R^2= .281, t(26)= -2.862, p = 0.008).

Investigations of LOC's relationship to overall neuroticism and mindset about intelligence, as shown in Figure 4c, revealed that internal LOC moderates this relationship, with confounds controlled for (R^2= .486 t(22)= -2.327, p=0.030). For external LOC individuals, overall neuroticism trended towards predicting mindset about intelligence, but it was not significant (R^2= .178 t(26)= -1.978, p = 0.059).

As shown in Tables 3a and b, the compassionate agreeableness and overall agreeableness variables were correlated with LOC so further analyses were conducted to assess LOC as a moderator. As shown in Figure 5a, no moderation was found for LOC between agreeable compassion and mindset about intelligence (internal: R^2= .360 t(24)= 1.635, p = .115, external: R^2= .068 t(28) = -.994, p= 0.329). However, internal LOC approached significance for moderating the relationship between overall agreeableness and mindset about intelligence, as shown in Figure 5b. Overall agreeableness trended towards significantly predicting mindset about intelligence with confounds controlled for (R^2= .461, t(22)= 2.038, p= 0.054). External

LOC did not show this pattern (R^2= .114, t(26) = -1.323, p= .197).

As shown in Tables 3a and b industrious conscientiousness was correlated with LOC, and so, additional analyses were run to assess LOC's role as a moderator in the relationship between this personality trait and mindset about intelligence. No role of moderation by LOC was found (internal: R^2= .294 t(22) = .176, p= .862, external: R^2= t(26) = 1.799, p = .084), however, for those with external LOCs, the relationship approached significance, as shown in Figure 6.

As shown in Tables 3a and b all three extraversion variables were highly correlated with LOC, so additional analyses were run to test LOC as a moderator between extraversion and mindset about intelligence. As shown in Figures 7a-c, LOC did not moderate the relationship between any of the extraversion variables and mindset about intelligence: enthusiastic extraversion (internal: R^2= 306 t(24)= .770, p= 0.449, external: R^2= .075 t(28)= 1.096, p=.282), assertive extraversion (internal: R^2=.289 t(24)=.057, p=.955, external: R^2= .041 t(28)=1.154, p= .258) and overall extraversion (internal: R^2= .296 t(24)=.511, p= .614, external: R^2= .087 t(28)= 1.263, p= .217). However, for overall extraversion and assertive extraversion, the relationship between these variables and mindset about intelligence was much closer to approaching significance among externals.

The last personality trait to be explored was openness. Both intellectual openness and overall openness were correlated with LOC , as shown in Tables 3a and b, and so LOC was investigated as a moderator between openness and mindset about intelligence. As shown in Figures 8a and b, LOC was not found to moderate intellectual openness (internal: R^2= .315 t(24)= .955, p=.349, external: R^2= .047 t(28)=.588, p=.561) or overall openness (internal: R^2= .326, t(24)= 1.151, p=.261, external: R^2= .039 t(28)=-.325, p= .747) and mindset about intelligence.

In summary, LOC was correlated with at least one subset of every personality trait, but did not moderate most of the relationships between personality and mindset. However, internal LOC was found to moderate the relationships that neurotic volatility, overall neuroticism, and overall agreeableness had with mindset about intelligence. External LOC also moderated the relationship between neuroticism withdrawal and mindset about intelligence.

Discussion

The present study was conducted in order to better understand influences on the development of beliefs about changeability. The specific influences explored were perceived parenting behaviors, in terms of maternal and paternal control and care provided throughout development and personality traits. Among primary analyses, the strongest relationship observed was between neurotic withdrawal and mindset about intelligence. The more neurotic an individual was, the less changeable they believed intelligence to be. Another important finding was that maternal control predicted mindset about intelligence; however, not as expected. Those children exposed to higher levels of maternal control and overprotection were more likely to have CBCs. It was expected that moderate control would predict the greatest number of individuals with CBCs; however, participants with the most controlling mothers had the highest scores on mindset about intelligence. Therefore, some aspects of the main hypotheses of the study were supported in that parenting behaviors and personality traits did influence mindset, but their influences were not as widespread as hypothesized.

The exploratory hypothesis about the moderating role that LOC plays was supported. As hypothesized, LOC was associated with many of the variables in the study including beliefs about the changeability of intelligence, at least one subset of each of the five personality traits and parental care and control. LOC was also found to moderate many relationships with mindset

about intelligence. Internal LOC moderated or approached moderation in the relationships between overall neuroticism and its subsets of volatility and withdrawal, and mindset about intelligence as well as the relationship between overall agreeableness and mindset about intelligence. There was also a difference in frustration based on mindset about intelligence in the internal LOC group. Each individual hypothesis and its findings are discussed below.

The frustration task and its accompanied mood scales were used to investigate if frustration influenced beliefs about changeability and if frustration was influenced by beliefs about changeability. The two variables were unrelated to one another, showing no support for either hypothesis. Past research has shown that following failure, helpless children expressed negative affect and gave up on the task, and that mastery-oriented children remained unfazed, maintained positive affect and continued to think positively about their future performance, as cited in Dweck et. al. (1995). Therefore, it was expected that participants with CBUs would show signs of negative affect following their failure, i.e. frustration, while participants with CBCs would maintain a positive attitude and show less frustration. These expectations were not met. Frustration scores were unrelated to mindset scores. The relationships between frustration and mindset may be mediated or moderated by a third variable like LOC, which would explain why there were not any significant findings. LOC as a moderator is discussed later on.

Research has shown that parents influence their children's beliefs and actions. Parents' perceptions of their children's abilities influence how children think about their abilities and are reflected in their children's academic achievement (Frome & Eccels, 1998; Henderson & Dweck, 1990; Dweck et. al., 1995). Parental behaviors are a common medium through which parents influence their children. The present findings are in accordance with this notion. Mother's level of parental control, when broken into low, moderate, and high levels, significantly predicted

children's mindset about intelligence in that the more controlling mothers were, the more participants thought that their intelligence could change. Similarly, although mother's parenting style was not significantly associated with mindset about intelligence, the group of participants who perceived their mothers as having an authoritarian parenting style, parenting marked by high levels of control, had fewer participants with CBUs than the authoritative or permissive parenting style groups. Given that authoritative parenting has been shown to be the most effective parenting style since it leads to high academic achievement and lends itself to promoting mastery-oriented goals, which are associated with beliefs about changeability (Dweck et. al., 1995), moderate control and high care were expected to predict CBCs. However, when maternal control was broken into low, moderate and high levels, the group with the most control had the highest mean score for mindset about intelligence. Additionally, the amount of care provided by mothers was not significantly related to mindset nor were paternal care or control. It is not surprising that fathers were not found to have a significant influence, since this has been documented in other studies of parental influence (Eccles, 1983; Pomerantz & Dong, 2006).

In explaining the current results, perhaps authoritative parents do not necessarily instruct mastery-oriented goals or that authoritarian parents do. Children of authoritarian parents may also be more likely to believe that their intelligence can change because of the achievement demands their parents place on them. Since they have to perform well, their intelligence has to be able to improve so that they can reach mandated goals.

Though parenting style was not a significant predictor of beliefs about changeability, total PBI scores (care + control), were. Mother PBI scores were positively correlated with both mindset about intelligence and overall mindset. The more caring and controlling mothers were perceived to be, the more participants believed in changeability. Mother PBI scores also

predicted overall mindset, in that the more caring and controlling mothers were, the more likely their children were to have a CBC. These findings support the importance of both care and control in the parental relationship and the validity of using the PBI as a measure of parenting. The significance of mother PBI scores may also have been driven entirely by control scores so it is unclear if maternal care played a role in predicting mindset in this instance.

There is a consensus in the literature that personality traits relate to coping styles, however; there is no direct research on the influence personality traits have on the development of beliefs about changeability. Based on concrete links between certain personality traits (i.e. openness, extraversion, conscientiousness and agreeableness) and adaptive coping strategies (Carver & Connor-Smith, 2010) and adaptive coping strategies and CBCs (Doron et.al., 2009), it was hypothesized that beliefs about changeability would be associated with these personality traits. However, these associations were not found. This may be because the influence of these personality traits on mindset is mediated or moderated by coping style. Direct individual relationships between openness, extraversion, conscientiousness and agreeableness and mindset about intelligence may not exist or may not be strong enough to be detected.

The literature suggests that these personality traits may work in combination to generate specific coping styles (Carver & Connor-Smith, 2010), and so it was hypothesized that in specific combinations they influence beliefs about the changeability of intelligence. Upon examination of combinations of personality traits, most did not support this theory. Individuals were determined to be high on a trait if their overall score on that trait was above one standard deviation from the mean. Similarly, participants were determined to be low on a trait if their score on the overall trait was below one standard deviation from the mean.

In groups of people with high extraversion and high conscientiousness, high

conscientiousness and low neuroticism, high neuroticism and low conscientiousness, and high conscientiousness and high agreeableness, an equal number of people had CBC and CBU mindsets, reflecting no pattern in beliefs about changeability. CBU mindsets were determined by scores of 3.0 and below on the scale for mindset about intelligence. CBC mindsets were determined by scores of 4.0 or above on this scale. However, the combination of high conscientiousness, high agreeableness, and high openness yielded favorable results. There were no fixed mindsets found in this group of people and all scores of mindset about intelligence were 3.5 and above. This suggests that people high on conscientiousness, agreeableness and openness also believe that intelligence is changeable. However, the samples of participants with each combination of traits ranged from 6 to 13, implying that these findings are not definitive. A greater number of participants are required to test these personality combinations and their relationship to beliefs about the changeability of intelligence.

Research has also linked neuroticism to maladaptive coping strategies (Carver & Connor-Smith, 2010) and maladaptive coping strategies to CBUs (Doron et. al., 2009), and so it was hypothesized that beliefs in unchangeability would be associated with neuroticism. This time, an association was found. Neuroticism withdrawal and overall neuroticism were both significantly negatively correlated with intelligence changeability and overall mindset. The higher the withdrawal score, the lower the score on mindset about intelligence, indicating that the more sad, fearful and less confident an individual is, the less changeable they believe their intelligence is. Withdrawal behaviors are highly reflective of negative coping styles, which may explain why it appears that this variable significantly predicts beliefs about the changeability of intelligence. Volatility may only influence mindset about intelligence through negative coping styles, or another variable as a mediator or moderator.

Those additional analyses on personality as a moderator of parenting behaviors and mindset about intelligence were hypothesized with the bidirectional relationship between parent and child interactions in mind. Parenting behaviors are influenced by child behaviors, which are influenced by children's personality. Together this bidirectional relationship has the potential to influence how children develop beliefs about changeability. However, analyses did not yield any such relationships. Since only neuroticism and mother control were significantly predictive of mindset about intelligence, this allowed for limited testing of the relationship between personality as a moderator in the relationship between parenting and beliefs about changeability. Maternal control and participant neuroticism were unrelated to one another, showing that these two variables do not influence one another.

In deciding if a person would be motivated to work hard to change the outcome of a situation, that person would ask themself three questions: Is the outcome changeable? If they answer yes to this question, they exemplify a CBC mindset. If they answer no, they have a CBU mindset. The second question they would ask is a change controllable? Lastly, is it controllable by me? This last question gauges a person's locus of control (LOC). If they answer yes, they have an internal locus of control and would be motivated to apply effort to change a situation, if they also have a CBC. If they do not think that they can control the situation, they exemplify an external locus of control and would not be motivated to make the effort to try to change the outcome, even if they do have a CBC, because they do not believe that the situation is changeable by them. One would therefore expect internals to have more CBCs than externals. Overall mindset and mindset about intelligence were both negatively correlated with LOC in this study, showing that the more internal a person is (lower LOC score), the more changeable they believe things to be. Mean scores for mindset about intelligence were significantly higher for

internal individuals than external individuals indicating that internality predicts CBCs.

Because of this clear link between LOC and mindset, the current study compiled LOC scores to assess how LOC influences mindset through interactions with personality traits and parenting behaviors. The above explanation of LOC's interaction with mindset exemplifies Rotter's social learning theory. As Lefcourt cites, "the potential for any behavior to occur in a given situation is a function of the person's expectancy that the given behavior will secure the available reinforcement, and the value of the available reinforcements for that person" (1966). Despite desiring a given goal, if an individual does not believe that they can produce a behavior that will yield the result, they will not act.

In our study we tested this by asking participants to predict the number of puzzle pieces they would be able to connect before beginning the task and then again after performing the task and being trained on it. Lefcourt cites Phare's study in which he found that "categorizing a situation as skill [driven] leads the subject to use the results of his past performance in formulating expectancies for future performances" (1966). Given that those people with beliefs in unchangeability tend to view their performances as skill driven, one would expect that an external person or a person with a CBU mindset would predict less improvement in their performance than an internal person or a person with a CBC. When the participants in the experimental group were split into internal and external LOCs, those with external LOC's had fewer beliefs in changeability. Externals also believed that their performance would improve less after training than internals, as expected. This was not a significant difference, but that could have been due to a small N.

As reported earlier, based on past findings you would expect individuals with CBUs to be more frustrated by failure than those with CBCs, which was not found. However, when you take

LOC into account, it is clear that beliefs about changeability are not the only influence on frustration. You would not expect an external individual's frustration to change based on their beliefs about changeability, because either way, they do not think that they have control over any change in performance. As expected, externals were not found to differ in frustration based on mindset. For internals, beliefs about changeability are important. You would expect an internal with a CBU to become more frustrated by their failure than an internal with a CBC, because to the person with a CBU, their failure is a reflection of their lack of ability, an ability that they do not believe can be improved on. On the other hand, internals with CBCs would not be expected to be as frustrated because they believe that they can improve. These expectations were fulfilled in our study. Internals with CBCs were less frustrated than internals with CBUs. However, the sample of participants who fell into these designations was not large enough to conclude significance.

Given parental influences on a child's thought processes, one would expect parental behaviors to influence the development of a child's LOC. Parents who are more responsive to their children's needs teach their children that their behaviors influence the reactions of those around them, and therefore they have control over events in their lives. Parental care should therefore be negatively correlated with LOC, and it is. The more caring both a mother and father are, the more internal their child tends to be. Conversely, if parents are controlling and overprotective, they teach their children that they have no say in what happens to them and that they are not in control of the events in their lives. Father control was positively correlated with LOC. Therefore, children with more controlling fathers have more external LOCs. Since parenting behavior influences LOC and LOC influences mindset about intelligence, it was hypothesized that LOC would moderate this relationship. However, LOC was not found to

moderate the relationship between parenting behaviors and mindset about intelligence. Parenting behaviors must therefore influence mindset about intelligence directly or through another mechanism.

In Lefcourt's review of LOC, he discusses studies that look at LOC as a personality characteristic. Rotter had found that "cautious-defensive or failure-avoidant strategies" were characteristic of highly external people while "aggressive, success-striving patterns" were more characteristic of internal people. Given LOC as a derivative of personality, one would expect that the main personality traits would align with either an internal or external LOC. In fact, they do. Neuroticism was positively correlated with LOC, indicating that higher neuroticism accompanied a more external LOC. Subsets of agreeableness, conscientiousness, extraversion, and openness were all negatively correlated with LOC, indicating that individuals higher in these traits, had lower LOCs and were more internal. Since LOC influences mindset about intelligence and many personality traits, it was tested as a moderator in the relationships between personality traits and mindset about intelligence.

As suspected, neurotic volatility influences mindset about intelligence via moderation. This relationship exists for individuals with an internal LOC, but not external LOC. Those individuals with an internal LOC who are not very volatile believe that intelligence is more changeable while those who are more volatile think that intelligence is less changeable. Internal LOC moderates the relationship between neurotic withdrawal and intelligence changeability in the same pattern as it did with neurotic volatility. Additionally, external LOC moderates the relationship between neurotic withdrawal and mindset about intelligence. For those who are external, the less withdrawn you are, the more you think intelligence is changeable and the more withdrawn you are, the less changeable you think your intelligence is. These patterns support our

predictions.

Agreeableness did not show as overt findings as neuroticism. LOC was not found to moderate agreeableness compassion and mindset about intelligence, but internal LOC may have moderated overall agreeableness and mindset about intelligence. For internal individuals, those who were more agreeable tended to think intelligence was more changeable and complementarily, those who were less agreeable thought that intelligence was less changeable. The effect may be hard to see because there was not a lot of variance in overall agreeableness scores. These findings align with the idea that agreeableness influences mindset about intelligence through moderation.

LOC did not moderate any of the remaining personality traits and mindset about intelligence, but some interesting patterns were found. For the most part there was little variance in conscientious industriousness scores, with most responses remaining between 3.0 and 4.0. However, the few external individuals with low industrious conscientiousness believed intelligence to be less changeable. A more identifiable pattern emerged in externals for overall and assertive extraversion, in which less extraverted individuals believed intelligence was less changeable.

Contributions. While most research on mindset revolves around the influence of mindset on psychopathology and focuses on how to change mindsets, the current study was a first effort to look at influences on mindset while including parenting behaviors and personality traits as well as the meditational influence of LOC. Most research concerning mindset also focuses on populations of children and adolescents. This study extends research on the topic to include emerging adults. It shows that mindset has a similar influence on reaction to failure for emerging adults as would be expected of younger populations. Understanding influences on the

development of mindset is vital to creating interventions to prevent the adoption of CBU mindsets. Creating a general population devoid of CBU mindsets has the potential to greatly reduce the use of maladaptive coping strategies, feelings of hopelessness, and the development of depression. CBC mindsets empower individuals to work harder, protect against psychopathology and intrinsically motivate people to try to improve their abilities. Dweck and her colleagues have found ways to increase beliefs in changeability, but only after CBUs have had negative impacts.

The current study provides a starting point for future research. It teaches us that control and overprotection can be useful in creating a CBC and supports the importance of reducing neurotic tendencies. It also provides evidence for the influence of LOC and promotes the development of internality. Finding ways to teach parents and educators to impart beliefs in changeability to children from the very beginning of their lives would be of tremendous value. This study is an important step towards better understanding how mindsets develop.

Limitations. Being the first study looking at this specific combination of variables, it is not without its limitations. Using any set of private university students reduces the generalizability of the study, since most of the general population does not conform to this demographic. The population of the current study, a convenience sample of predominantly students in introductory psychology classes, may be particularly skewed. The demographic profile of these students did not match the university as a whole; there were far more females, a greater percentage of freshmen, and a limited distribution of academic interests. The ethnic composition of the study was, however, representative of the Emory population. These students may also have been acutely aware of the possibility of manipulation. This in combination with the lack of consequences for a poor performance on the task may have reduced motivation to

perform to the best of one's ability and significantly reduced the effect of the task to frustrate participants.

The time constraint placed on the project limited the resources available and required flexibility in study design. The researcher would have liked to have developed a more frustrating task, perhaps using deception, but time did not allow for this. More time would have also allowed for the measures created for the study to be tested for criterion validity. Additionally, the design of the study would have benefited from the implementation of the questionnaire on mindset about intelligence directly after frustration to better gauge if frustration affected mindset about intelligence.

Future Directions and Possible Applications. As stated, this study is a first attempt at studying influences on the development of mindset. Future research should consider including coping styles as a variable when examining the interaction between personality and mindset. Since Doron et.al. (2009) has found a relationship between coping strategies and beliefs about changeability and Carver and Connor-Smith (2010) confirmed relationships between personality traits and coping strategies, it is probable that coping styles acts as a mediator or moderator between personality traits and mindset.

It would also be useful to research additional types of parenting behaviors that may influence children's mindsets. Parental care and control are not sufficient enough factors in exploring such links. Some additional areas of parenting that should be assessed are parental mindsets, to compare with their children's, and the types of goals parents hold for their children, whether mastery or performance oriented. Links between parental goals, parenting styles and children's mindsets should also be explored. Levels of responsiveness and demandingness designate parenting styles and though level of care is related to responsiveness, and control is

related to demandingness, these PBI factors may not be associated with the aspects of responsiveness and demandingness that are typically used to determine parenting style. Future research should use measures of parental responsiveness and demandingness following child academic failure to better gauge parental influence on beliefs about changeability. Parental reaction to child failure influences how their child appraises the situation. Negative appraisals can lead to maladaptive copings and feelings of helplessness and thus unchangeable beliefs, while positive appraisals lead to remedial actions to improve future outcomes and thus incremental beliefs (Hong et al., 1999).

Once research has sufficiently investigated influences on mindset, researchers can move onto designing educational programs for parents and teachers to help instill core beliefs in changeability in children from birth. Teaching children something this fundamental can help shield them from psychopathology for the rest of their lives. It also promotes a more positive outlook from which to view setbacks. If a child believes that failure is simply a challenge, they will appraise the situation more positively and will be more likely to embrace adaptive coping strategies that they will utilize throughout development. For instance, believing that you can improve your math abilities from the first grade on will motivate effortful learning and can clear the path to an applied math major in college and prevent years of disappointment and self-loathing over academic failure. Holding the belief that you can change is one of the most useful tools a person can have. Learning about how mindsets form will not only benefit future children, but others as well. It will help emerging adults prepare for adulthood and parenthood and teach parents to be more aware of their own actions. By learning more about beliefs in changeability, adults may also be able to change their own mindset. Learning that change is possible is the first step towards changing one's beliefs.

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Table 1

Descriptive Statistics of Sample

Variables	N	%
Gender		
Male	21	25.6
Female	62	74.4
Age		
17	1	1.2
18	28	33.7
19	33	39.8
20	13	15.7
21	6	7.2
+21	2	2.4
Year		
Freshman	42	50.6
Sophomore	29	34.9
Junior	9	10.8
Senior	3	3.6
GPA*		
High School		
3.0 – 3.5	1	1.3
3.51 - 4.0	7	9.0
4.01+	2	2.6
College		
2.0 - 2.5	2	2.6
2.51 - 3.0	10	12.8
3.01 - 3.5	33	42.3
3.51- 4.0	23	29.5
Ethnicity		
Caucasian	37	45.1
African American	9	11.0
Hispanic	7	8.5
Asian	24	28.0
Other	6	7.3
Socioeconomic Status		
Working Class	6	7.3
Lower Middles Class	5	6.1
Middle Class	18	22.0
Upper Middle Class	34	41.5
Upper Class	19	22.0

* Not all participants responded, % based on N = 78

Table 2

Mean and Standard Deviation of Primary Variables

Variables	M	SD
Implicit Beliefs (Mindset)		
Intelligence		
CBC	4.75	.62
CBU	2.39	.43
Average	3.73	1.12
Personality		
CBC	4.67	.63
CBU	2.38	.60
Average	3.0	1.01
Overall*		
CBC	4.52	.46
CBU	2.53	.46
Average	3.30	.85
Mother PBI		
Care	29.46	5.32
Control	14.42	7.64
PBI Total (Care + Control)	43.88	7.99
Father PBI		
Care	26.10	8.29
Control	12.32	7.13
PBI Total (Care + Control)	38.42	9.39
Big Five Personality Traits		
Neuroticism		
Volatility	2.73	.78
Withdrawal	3.04	.71
Average	2.88	.69
Agreeableness		
Compassion	4.16	.53
Politeness	3.72	.55
Average	3.94	.44
Conscientiousness		
Industriousness	3.23	.47
Orderliness	3.49	.61
Average	3.36	.42
Extraversion		
Enthusiasm	3.75	.63
Assertiveness	3.42	.61
Average	3.58	.54
Openness/Intellect		
Intellect	3.48	.55
Openness	3.63	.46
Average	3.79	.56

* Average of Intelligence, Personality, Personality of Other (not shown)

Table 3 a

Bivariate Correlation between Beliefs about Changeability and Confounds

Variable	LOC	Social Desirability	Gender	Age	Year	GPA	Ethnicity	SES
Personality Changeability (self)								
r	-.116	.165	-.103	-.077	-.026	.021	.000	.122
p	.292	.134	.354	.486	.817	.855	1.000	.277
Intelligence Changeability								
r	-.276*	.063	-.039	-.121	-.020	-.214	.123	-.232*
p	.011	.571	.729	.275	.859	.057	.268	.036
Overall Mindset								
r	-.255*	.139	-.094	-.115	-.017	-.106	.063	-.050
p	.019	.209	.397	.302	.881	.352	.573	.655

Notes: *p < .05, 2-tailed.

Table 3 b

Bivariate Correlation between Personality Traits and Confounds

Variable	LOC	Social Desirability	Gender	Age	Year	GPA	Ethnicity	SES
Neuroticism: Volatility								
r	.304**	-.523**	.315**	.055	.118	-.007	-.119	.059
p	.005	.000	.004	.620	.290	.951	.283	.595
Neuroticism: Withdrawal								
r	.421**	-.371**	.258*	.027	.035	.051	-.163	-.076
p	.000	.001	.019	.807	.751	.651	.141	.496
Neuroticism: Overall								
r	.391**	-.489**	.313**	.045	.085	.023	-.152	-.006
p	.000	.000	.004	.683	.444	.842	.169	.958
Agreeableness: Compassion								
r	-.279*	.040	.193	-.184	-.122	.082	-.155	-.066
p	.010	.717	.081	.095	.271	.472	.161	.555
Agreeableness: Politeness								
r	-.063	.416**	.179	.060	.020	-.078	-.031	-.179
p	.570	.000	.106	.588	.857	.494	.781	.109

Table 3 b continued

Bivariate Correlation between Personality Traits and Confounds

Variable	LOC	Social Desirability	Gender	Age	Year	GPA	Ethnicity	SES
Agreeableness: Overall								
r	-.208	.284**	.232*	-.075	-.063	.002	-.115	-.154
p	.057	.009	.035	.499	.574	.987	.299	.168
Conscientiousness: Industriousness								
r	-.246*	.493**	-.047	.052	-.021	.153	.063	.164
p	.024	.000	.672	.641	.850	.177	.569	.140
Conscientiousness: Orderliness								
r	-.043	.038	.140	-.005	-.033	.147	-.072	-.027
p	.699	.731	.206	.961	.764	.193	.521	.812
Conscientiousness: Overall								
r	-.168	.302**	.076	.025	-.036	.192	-.017	.073
p	.127	.005	.497	.823	.746	.087	.881	.515
Extraversion: Enthusiasm								
r	-.332**	.024	.088	-.141	.010	.098	-.041	.121
p	.002	.830	.428	.203	.927	.385	.710	.278
Extraversion: Assertiveness								
r	-.319**	-.052	.044	-.037	.078	.068	-.043	.086
p	.003	.638	.695	.742	.486	.551	.702	.442
Extraversion: Overall								
r	-.371**	-.015	.076	-.102	.049	.097	-.048	.119
p	.001	.890	.497	.357	.657	.390	.667	.288
Openness: Intellect								
r								
p	-.223*	.084	-.190	-.093	-.073	.266*	.083	.005
	.041	.445	.086	.404	.514	.017	.455	.961
Openness: Openness								
r	-.191	.001	-.004	.171	.163	-.124	.004	-.251*
p	.082	.995	.973	.122	.142	.271	.973	.023
Openness: Overall								
r								
p	-.248*	.051	-.115	.048	.054	.083	.052	-.148
	.023	.647	.299	.670	.625	.466	.642	.185

Notes: **p < .01, 2-tailed. *p < .05, 2-tailed.

Table 3c

Bivariate Correlation between Parenting Behaviors and Confounds

Variable	LOC	Social Desirability	Gender	Age	Year	GPA	Ethnicity	SES
Mother Care								
r	-.354**	.179	.167	-.075	-.153	.150	-.112	.094
p	.001	.103	.132	.500	.167	.185	.315	.401
Mother Control								
r	.095	-.027	-.081	.187	.269*	-.122	.036	-.071
p	.391	.810	.467	.090	.014	.281	.746	.525
Mother Parenting Style								
r	.080	.141	-.148	.230*	.113	-.054	.027	.147
p	.477	.205	.186	.039	.314	.641	.814	.194
Father Care								
r	-.301**	.135	.111	.054	.035	.140	-.156	.355**
p	.005	.220	.317	.626	.755	.216	.158	.001
Father Control								
r	.170	-.204	-.094	.156	.272*	-.050	.067	.027
p	.123	.063	.397	.160	.013	.661	.550	.809
Father Parenting Style								
r	-.003	-.061	.036	-.032	-.158	-.039	-.065	-.093
p	.978	.584	.750	.777	.157	.733	.560	.409
Frustration								
r	-.088	-.060	.075	-.070	-.243*	-.016	.031	-.145
p	.427	.587	.503	.529	.027	.891	.780	.195

** p < .01, 2-tailed. *p < .05, 2-tailed.

Table 4

Summary Regression Table for Frustration and Mindset

Variable	Frustration (All)				
	B	*SE B*	β	R^2	p-value
Mindset about Intelligence	-.01	.04	-.03	.001	.773
Mindset about Personality	-.00	.04	-.00	.000	.969
Overall Mindset	-.00	.04	-.01	.053	.670

Table 5

Bivariate Correlation between Performance Based Beliefs about Changeability

Variable	Redo	Training Task Redo	Training Skill Redo	Training Skill Ability
Mindset about Personality				
r				
p	-.112	-.048	-.060	.076
	. .309	.665	.589	.494
Mindset about Intelligence				
r	.112	.192	.141	.339**
p	.309	.080	.201	.002
Overall Mindset				
r				
p	-.039	.071	.059	.262*
	.726	.521	.591	.016

** p < .01, 2-tailed. * p < .05, 2-tailed.

Table 6a

Bivariate Correlation between Parenting Style and Mindset

Variable	Mother Parenting Style	Father Parenting Style
Mindset about Personality		
r		
p	-.129	-.083
	.247	.455
Mindset about Intelligence		
r		
p	-.039	-.026
	.725	.818
Overall Mindset		
r	-.092	-.044
p	.411	.693

Table 6b

Summary Regression Table for Parenting Style and Mindset

Variable	Mother's Parenting Style					Father's Parenting Style				
	B	*SE B*	β	R^2	*p-value*	*B*	*SE B*	β	R^2	*p-value*
Mindset about Intelligence	-.06	.17	-.04	.002	.725	-.03	.14	-.03	.001	.818
Mindset about Personality	-.17	.15	-.13	.017	.247	-.09	.12	-.08	.007	.455
Overall Mindset	-1.45	1.75	-.09	.008	.410	-.04	.11	-.04	.002	.693

Table 7

Summary Regression Table for Total PBI Scores and Mindset

Variable	Mother's PBI					Father's PBI				
	B	*SE B*	β	R^2	*p-value*	*B*	*SE B*	β	R^2	*p-value*
Mindset about Intelligence	.024	.015	.174	.214	.104	.015	.014	.126	.200	.291
Mindset about Personality	.025	.014	.198	.039	.070	.020	.013	.186	.044	.130
Overall Mindset	.026	.011	.243	.123	.023*	.017	.011	.188	.100	.124

Note: * p < .05

Table 8a

Bivariate Correlation between Parental Care and Control and Mindset

	Mother		Father	
Variable	Care	Control	Care	Control
Mindset about Personality				
r				
p	.209†	.062	.181†	.038
	.028	.577	.050	.734
Mindset about Intelligence				
r				
p	.052	.232*	-.037	.141
	.319	.034	.370	.201
Overall Mindset				
r	.178	.164	.100	.109
p	.053	.137	.183	.326

Notes: †p < .05 level, 1-tailed. *p < .05 level, 2- tailed.

Table 8b

Summary Regression Table for Parental Care and Control and Mindset

Variable	Mother						Father					
	Care			Control			Care			Control		
	B	*SE B*	β	*B*	*SE B*	β	*B*	*SE B*	β	*B*	*SE B*	β
Personality Changeability	.04	.02	.19	-	-	-	.02	.02	.13	-	-	-
Intelligence Changeability	-	-	-	.03	.02	.18	-	-	-	-	-	-
Overall Mindset	-	-	-	-	-	-	-	-	-	-	-	-

Note: Only those variables found to have significant correlations were followed with regressions.
Mother: Care (R^2 = .046, p = .101), Control (R^2 = .179, p = .057). Father: Care (R^2 = .039, p = .306).

Table 8c

Means for Mother Control Levels

Variable	Low	Moderate	High
Mindset about Personality			
M			
SD	2.71	3.06	3.00
	1.32	.96	.95
Mindset about Intelligence			
M			
SD	3.25*	3.66*	4.34*
	1.35	1.02	1.11
Overall Mindset			
M			
SD	2.96	3.30	3.58
	1.00	.79	.85

Note: *Significantly different from other mindset groups at the p < .05 level

Table 9a

Bivariate Correlation between Openness and Extraversion and Mindset

Variable	O: Openness	O: Intellect	O: Overall	E: Enthusiasm	E: Assertiveness	E: Overall
Mindset about Personality						
r	.025	-.088	-.038	.056	-.030	.016
p	.412	.213	.367	.307	.393	.444
Mindset about Intelligence						
r	.097	.055	.091	.140	.093	.133
p	.190	.311	.206	.102	.201	.113
Overall Mindset						
r	.075	-.017	.035	.124	.022	.084
p	.250	.440	.376	.130	.422	.223

Notes: 1-tailed

Table 9b

Bivariate Correlation between Conscientiousness and Agreeableness and Mindset

Variable	C: Industriousness	C: Orderliness	C: Overall	A: Compassion	A: Politeness	A: Overall
Mindset about Personality						
r	.046	-.136	-.073	-.146	.099	-.026
p	.339	.109	.254	.093	.185	.406
Mindset about Intelligence						
r	.112	-.113	-.019	.015	.111	.078
p	.154	.154	.431	.445	.158	.239
Overall Mindset						
r	.095	-.174	-.073	-.092	.136	.029
p	.195	.056	.253	.203	.109	.396

Notes: 1-tailed

Table 10a

Bivariate Correlation between Neuroticism and Mindset

Variable	N: Volatility	N: Withdrawal	N: Overall
Mindset about Personality			
r	-.014	-.078	-.048
p	.451	.241	.332
Mindset about Intelligence			
r	.-.185*	-.342	-.282**
p	.046	.001**	.005
Overall Mindset			
r	-.125	-.252*	-.202*
p	.128	.010	.033

Notes: *p < .05, 1-tailed. **p < .01, 1-tailed.

Table 10b

Linear Regression for Neuroticism and Mindset

	N: Volatility			N: Withdrawal			N: Overall		
Variable	*B*	*SE B*	β	*B*	*SE B*	β	*B*	*SE B*	β
Mindset about Personality	-	-	-	-	-	-	-	-	-
Mindset about Intelligence	-.136	.194	-.095	-.478	.195	-2.45*	-.382	.220	-1.74
Overall Mindset	-	-	-	-.152	.164	-.126	-.055	.182	-.044

Note: Intelligence: Volatility (R^2 = .193, p = .484), Withdrawal (R^2 = .250, p = .017*), Overall (R^2 = .220, p = .087). Overall: Withdrawal (R^2 = .106 , p = .356), Overall (R^2 = .096, p = .762).

Table 11a

High Neuroticism and Low Conscientiousness and Mindset About Intelligence

Neuroticism Score	Conscientiousness Score	Intelligence Changeability score	Mindset
3.65	2.80	3.00	CBU
3.30	3.00	3.83	
3.50	3.15	3.50	
3.55	2.90	4.00	CBC
3.90	2.90	3.50	
3.35	2.75	5.16	CBC
3.95	2.95	2.33	CBU
3.50	3.10	4.00	CBC
3.60	2.80	1.66	CBU
3.85	2.55	2.00	CBU
3.85	2.85	4.16	CBC
Total CBC = 4		Total CBU = 4	

Table 11b

Low Neuroticism and High Conscientiousness and Mindset About Intelligence

Neuroticism Score	Conscientiousness Score	Intelligence Changeability score	Mindset
1.40	4.50	6.00	CBC
2.25	3.85	3.50	
2.50	3.80	2.50	CBU
2.15	3.75	3.50	
2.35	3.70	2.67	CBU
2.25	3.60	4.83	CBC
2.30	3.75	2.83	CBU
2.30	4.10	2.83	CBU
2.10	3.95	2.83	CBU
1.70	3.75	4.00	CBC
2.35	3.80	4.00	CBC
1.65	3.80	3.50	
1.45	4.05	6.00	CBC
Total CBC = 5		Total CBU = 5	

Table 11c

High Extraversion and High Conscientiousness and Mindset about Intelligence

Extraversion Score	Conscientiousness Score	Intelligence Changeability score	Mindset
3.75	4.05	2.33	CBU
3.80	3.90	2.50	CBU
3.75	4.35	2.33	CBU
3.75	3.95	5.50	CBC
3.95	4.40	2.83	CBU
3.75	4.00	4.00	CBC
4.15	4.40	3.66	
3.80	4.20	3.50	
4.05	4.30	6.00	CBC
3.70	4.45	4.33	CBC
Total CBC = 4		Total CBU = 4	

Table 11d

High Conscientiousness and High Agreeableness and Mindset about Intelligence

Conscientiousness Score	Agreeableness Score	Intelligence Changeability score	Mindset
4.55	3.75	2.33	CBU
4.70	4.50	6.00	CBC
4.75	4.15	3.67	
4.30	4.10	3.00	CBU
4.65	3.70	4.33	CBC
4.35	3.60	5.00	CBC
4.75	4.25	2.33	CBU
Total CBC = 3		Total CBU = 3	

Table 11e

High Conscientiousness, High Extraversion and High Openness and Mindset about Intelligence

Extraversion Score	Conscientiousness Score	Openness Score	Intelligence Changeability score	Mindset
3.75	4.00	3.90	4.00	CBC
4.15	4.40	3.90	3.67	
3.80	4.20	4.00	3.50	
4.05	4.30	4.25	6.00	CBC
3.80	4.20	4.00	3.50	
3.70	4.45	4.45	4.33	CBC
Total CBC = 3		Total CBU = 0		

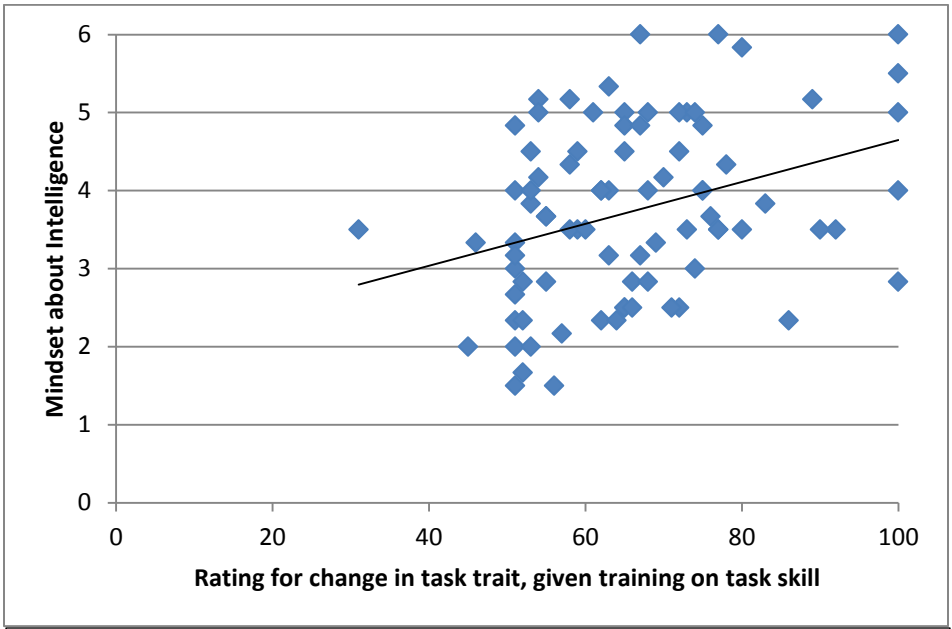

Figure 1. Belief in changeability of task trait with training on task skill as a predictor of belief in the changeability of intelligence.

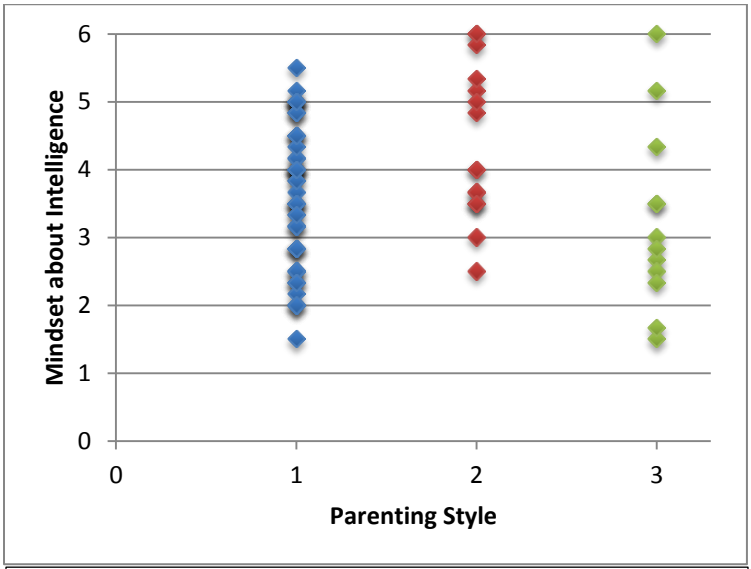

Figure 2. Mindset about intelligence based on parenting style. Under parenting style, 1 represents authoritative, 2 is authoritarian and 3 is permissive parenting.

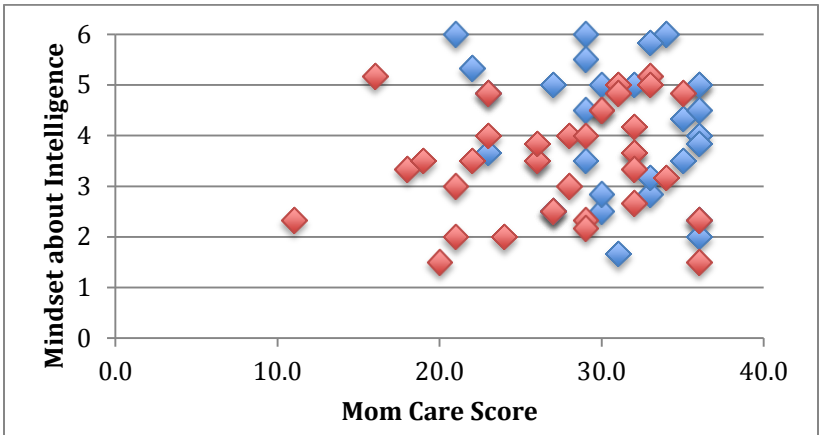

Figure 3a. Score on mom care as a predictor of belief about the changeability of intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

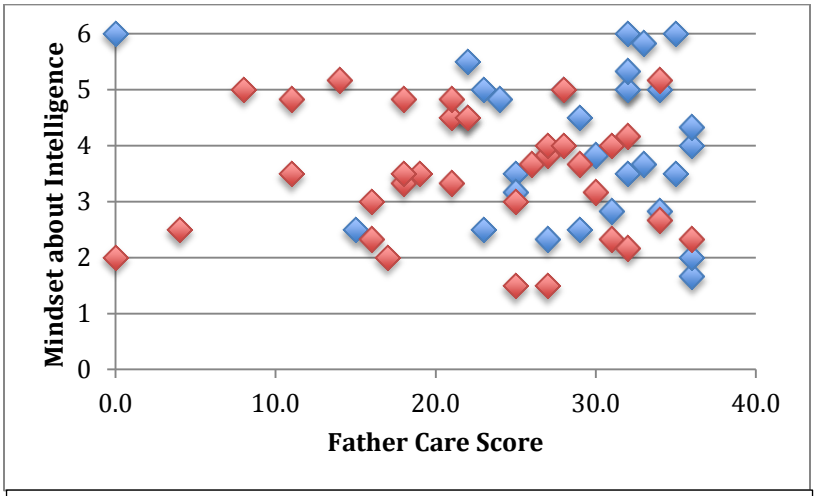

Figure 3b. Score on father care as a predictor of belief about the changeability of intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

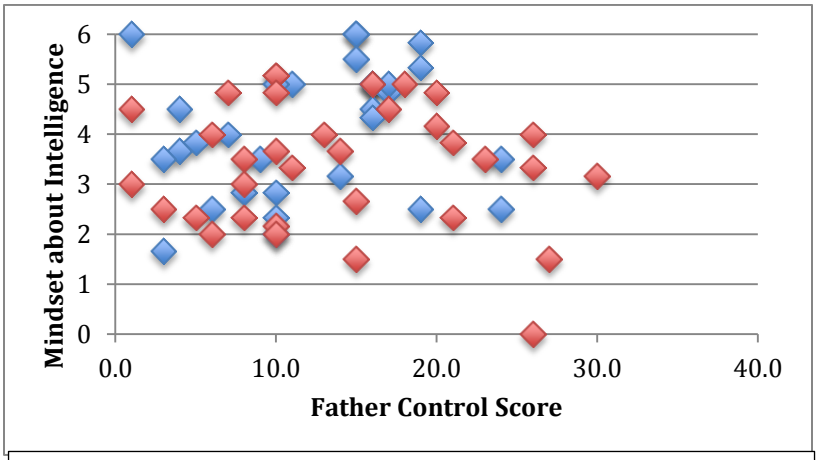

Figure 4. Score on father control as a predictor of belief about the changeability of intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

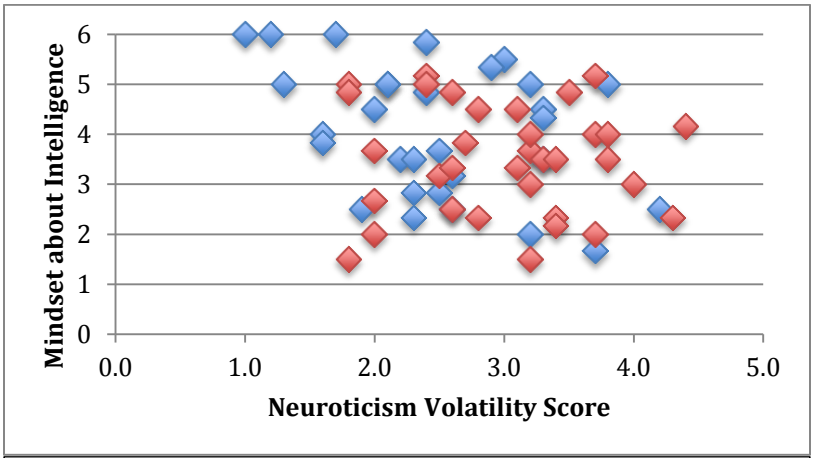

Figure 5a. Score on neuroticism volatility as a predictor of mindset about intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

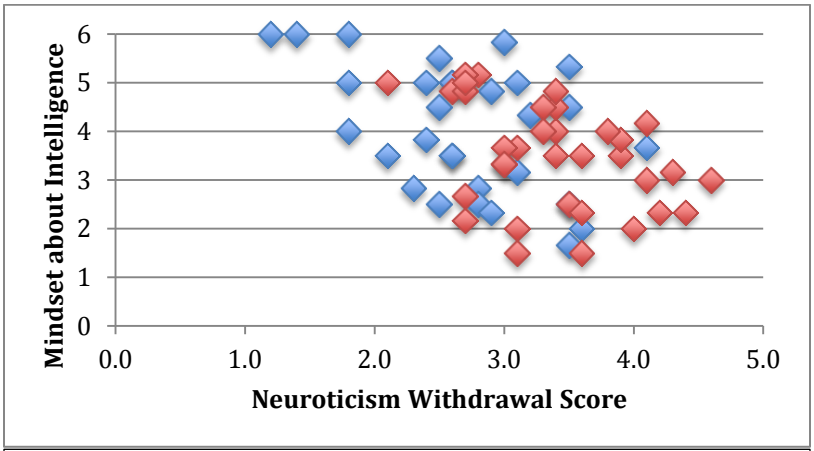

Figure 5b. Score on neuroticism withdrawal as a predictor of mindset about intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

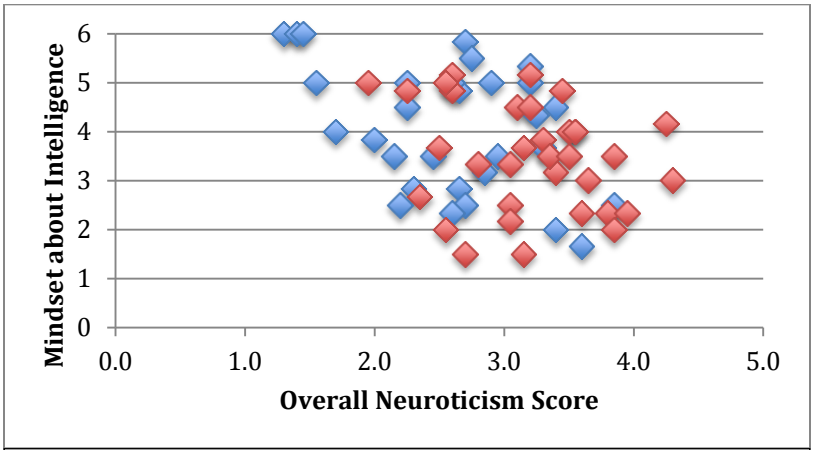

Figure 5c. Score on overall neuroticism as a predictor of mindset about intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

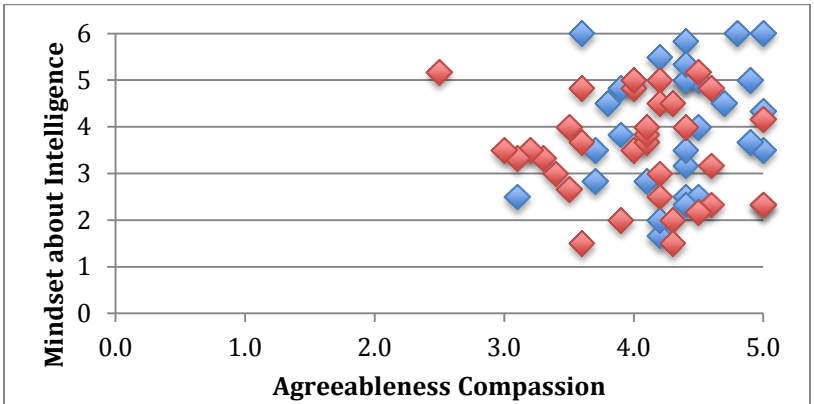

Figure 6a. Score on agreeableness compassion as a predictor of mindset about intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

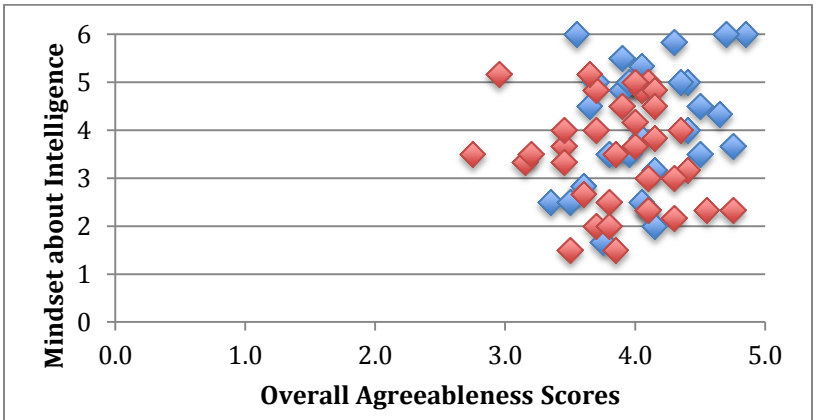

Figure 6b. Score on overall agreeableness as a predictor of mindset about intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

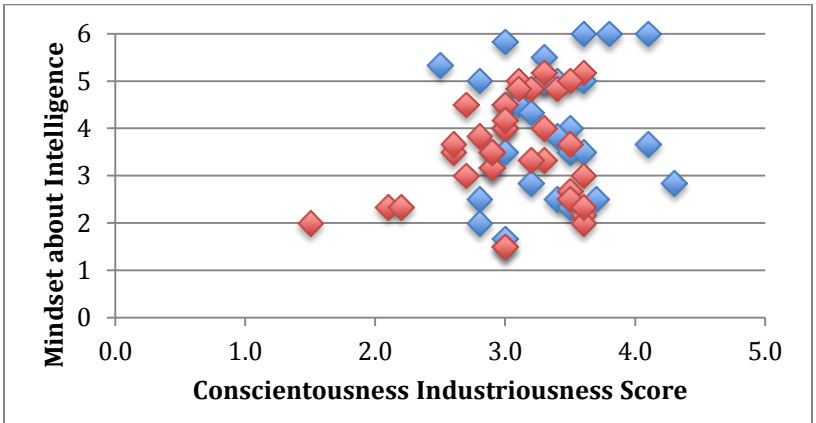

Figure 7. Score on conscientiousness industriousness as a predictor of mindset about intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

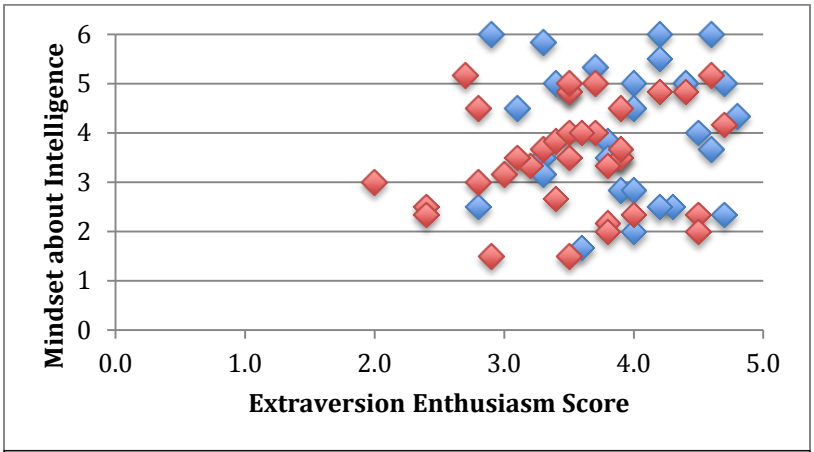

Figure 8a. Score on extraversion enthusiasm as a predictor of mindset about intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

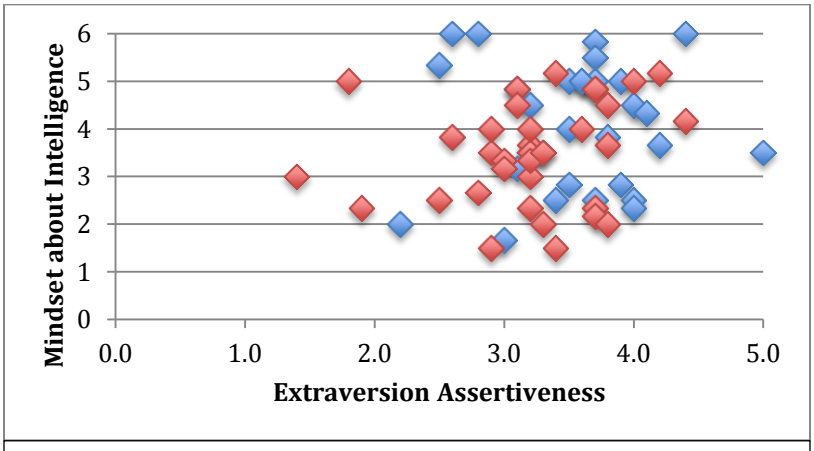

Figure 8b. Score on extraversion assertiveness as a predictor of mindset about intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

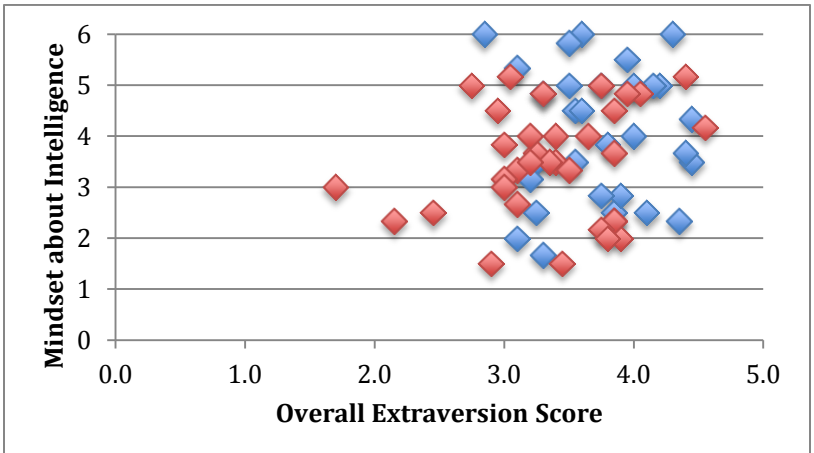

Figure 8c. Score on overall extraversion as a predictor of mindset about intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

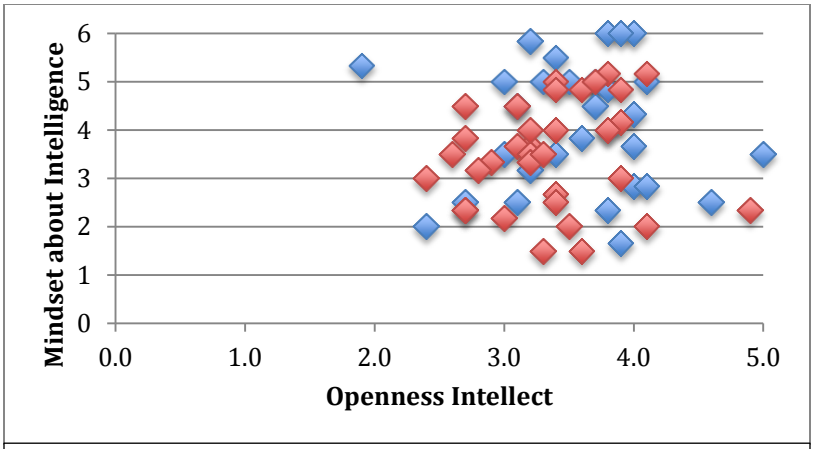

Figure 9a. Score on openness intellect as a predictor of mindset about intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

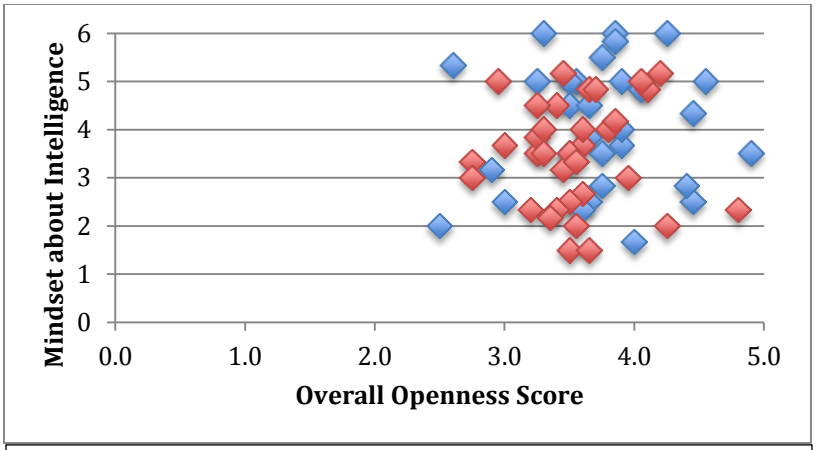

Figure 9b. Score on overall openness as a predictor of mindset about intelligence. Blue diamonds represent people with internal LOCs and red diamonds are people with external LOCs.

Appendix A

i. **Mindset Measures**

Implicit Personality Theory Questionnaire (self)

Read each sentence below about YOURSELF and mark the answer that shows how much you agree or disagree with it. There are no right or wrong answers.

1. Your personality is a part of you that you can't change very much.
2. You can do things to get people to like you, but you can't change your real personality.
3. You are a certain kind of person, and there is not much that can be done to really change that.
4. You can do things differently, but the important parts of who you are can't really be changed.

Implicit Personality Theory Questionnaire (others)

Read each sentence below about OTHER PEOPLE and mark the answer that shows how much you agree or disagree with it. There are no right or wrong answers.

1. Someone's personality is a part of them that they can't change very much.
2. Everyone is a certain kind of person, and there is not much that can be done to really change that.
3. People can do things differently, but the important parts of who they are can't really be changed.
4. A person can do things to get people to like them, but they can't change their real personality.

Implicit Theories of Intelligence Questionnaire

Read each sentence below and mark the answer that shows how much you agree or disagree with it. There are no right or wrong answers.

1. You have a certain amount of intelligence, and you can't really do much to change it.
2. Your intelligence is something about you that you can't change very much.
3. No matter who you are, you can change your intelligence a lot. (r)
4. You can learn new things, but you can't really change how intelligent you are.
5. No matter how much intelligence you have, you can always change it quite a bit. (r)
6. You can always greatly change how intelligent you are. (r)

[All scales are from Strongly agree [1]to Strongly disagree [6]. (Strongly agree; Agree; Slightly agree; Slightly disagree; Disagree; Strongly disagree)]

Beliefs in Task Changeability Questions

Experimental

1. You have a certain amount of mental retention, and you can't really do much to change it.
2. Your mental retention is something about you that you can't change very much.
3. You can learn new skills to do better on a task like this, but you can't really change your mental rotation.

4. You can learn to remember which pieces you have used before with training and thus, can increase your mental retention. (r)
5. No matter who you are, you can change your mental retention a lot. (r)
6. No matter how much mental rotation ability you have, you can always change it quite a bit. (r)
7. You can always greatly change how well you remember things. (r)

Control

1. You have a certain amount of social intelligence, and you can't really do much to change it.
2. Your social intelligence is something about you that you can't change very much.
3. No matter who you are, you can change your social intelligence a lot. (r)
4. You can learn to accurately attribute types of mental states with training and thus, can increase your social intelligence. (r)
5. You can learn new things to do better on this task, but you can't really change your social intelligence.
6. No matter how much social intelligence you have, you can always change it quite a bit. (r)
7. You can always greatly change how socially intelligent you are. (r)

[Scales are from Strongly Agree [1] to Strongly Disagree [5]. (Strongly Agree, Agree, Neither Agree nor Disagree, Disagree, Strongly Disagree)]

ii. **Big Five Aspects Scale (BFAS)**

Items

Neuroticism

Volatility

Get angry easily.
Rarely get irritated. (R)
Get upset easily.
Keep my emotions under control. (R)
Change my mood a lot.
Rarely lose my composure. (R)
Am a person whose moods go up and down easily.
Am not easily annoyed. (R)
Get easily agitated.
Can be stirred up easily.

Withdrawal

Seldom feel blue. (R)
Am filled with doubts about things.
Feel comfortable with myself. (R)
Feel threatened easily.
Rarely feel depressed. (R)
Worry about things.
Am easily discouraged.
Am not embarrassed easily. (R)
Become overwhelmed by events.
Am afraid of many things.

Agreeableness

Compassion

Am not interested in other people's problems. (R)
Feel others' emotions.
Inquire about others' well-being.
Can't be bothered with other's needs. (R)
Sympathize with others' feelings.
Am indifferent to the feelings of others. (R)
Take no time for others. (R)
Take an interest in other people's lives.
Don't have a soft side. (R)
Like to do things for others.

Politeness

Respect authority.
Insult people. (R)
Hate to seem pushy.
Believe that I am better than others. (R)
Avoid imposing my will on others.
Rarely put people under pressure.
Take advantage of others. (R)
Seek conflict. (R)
Love a good fight. (R)
Am out for my own personal gain. (R)

Conscientiousness

Industriousness

Carry out my plans.
Waste my time. (R)
Find it difficult to get down to work. (R)
Mess things up. (R)
Finish what I start.
Don't put my mind on the task at hand. (R)
Get things done quickly.
Always know what I am doing.
Postpone decisions. (R)
Am easily distracted. (R)

Orderliness

Leave my belongings around. (R)
Like order.
Keep things tidy.
Follow a schedule.
Am not bothered by messy people. (R)
Want everything to be "just right."
Am not bothered by disorder. (R)
Dislike routine. (R)
See that rules are observed.
Want every detail taken care of.

Extraversion

Enthusiasm

Make friends easily.
Am hard to get to know. (R)
Keep others at a distance. (R)
Reveal little about myself. (R)
Warm up quickly to others.
Rarely get caught up in the excitement. (R)
Am not a very enthusiastic person. (R)
Show my feelings when I'm happy.
Have a lot of fun.
Laugh a lot.

Assertiveness

Take charge.
Have a strong personality.
Lack the talent for influencing people. (R)
Know how to captivate people.
Wait for others to lead the way. (R)
See myself as a good leader.
Can talk others into doing things.
Hold back my opinions. (R)
Am the first to act.
Do not have an assertive personality. (R)

Openness/Intellect

Intellect

Am quick to understand things.
Have difficulty understanding abstract ideas. (R)
Can handle a lot of information.
Like to solve complex problems.
Avoid philosophical discussions. (R)
Avoid difficult reading material. (R)
Have a rich vocabulary.
Think quickly.
Learn things slowly. (R)
Formulate ideas clearly.

Openness

Enjoy the beauty of nature.
Believe in the importance of art.
Love to reflect on things.
Get deeply immersed in music.
Do not like poetry. (R)
See beauty in things that others might not notice.
Need a creative outlet.
Seldom get lost in thought. (R)
Seldom daydream. (R)
Seldom notice the emotional aspects of paintings and pictures. (R)

Note. (R) = reverse scored.

iii. **Parental Bonding Instrument (PBI)**

Items
1. Spoke to me in a warm and friendly voice
2. Did not help me as much as I needed
3. Let me do those things I liked doing
4. Seemed emotionally cold to me
5. Appeared to understand my problems and worries
6. Was affectionate to me
7. Liked me to make my own decisions
8. Did not want me to grow up
9. Tried to control everything I did
10. Invaded my privacy
11. Enjoyed talking things over with me
12. Frequently smiled at me
14. Did not seem to understand what I needed or wanted
15. Let me decide things for myself
16. Made me feel I wasn't wanted
17. Could make me feel better when I was upset
18. Did not talk with me very much
19. Tried to make me feel dependent on her/him
20. Felt I could not look after myself unless she/he was around
21. Gave me as much freedom as I wanted
22. Let me go out as often as I wanted
23. Was overprotective of me
24. Did not praise me
25. Let me dress in any way I pleased

Parental Caring:
11, 18, 17, 12, 1, 6, 5, 14, 2, 24, 4, 16
Overprotection:
(Denial of psychological autonomy) 10, 9, 20, 13, 23, 19, 8
(Encouragement of behavioral freedom) 22, 21, 3, 25, 15, 7

iv. **Locus of Control (LOC)**

INSTRUCTIONS: Please mark the answer below that best describes your beliefs. There are no right or wrong answers.

1. Do you believe that most problems will solve themselves if you don't fool with them?
- ❍ Yes (1)
- ❍ No (0)

2. Do you believe that you can stop yourself from catching a cold?
- ❍ Yes (0)
- ❍ No (1)

3. Are some people just born lucky?
- ❍ Yes (1)
- ❍ No (0)

4. Most of the time, do you feel that getting good grades means a great deal to you?
- ❍ Yes (0)
- ❍ No (1)

5. Are you often blamed for things that just aren't your fault?
- ❍ Yes (1)
- ❍ No (0)

6. Do you believe that if somebody studies hard enough, he or she can pass any subject?
- ❍ Yes (0)
- ❍ No (1)

7. Do you feel that most of the time it doesn't pay to try hard because things never turn out right anyway?
- ❍ Yes (1)
- ❍ No (0)

8. Do you feel that if things start out good in the morning, it's going to be a good day no matter what you do?
- ❍ Yes (1)
- ❍ No (0)

9. Do you feel that most of the time parents listen to what their children have to say?
- ❍ Yes (0)
- ❍ No (1)

10. Do you believe that wishing can make good things happen?
- ❍ Yes (1)
- ❍ No (0)

11. When you get criticized, does it usually seem that it's for no good reason at all?
- ❍ Yes (1)
- ❍ No (0)

12. Most of the time, do you find it hard to change a friend's (mind) opinion?
- ❍ Yes (1)
- ❍ No (0)

13. Do you think that cheering more than luck helps a team to win?
- ❍ Yes (0)
- ❍ No (1)

14. Do you feel that it is nearly impossible to change your parents' minds about anything?
- ❍ Yes (1)
- ❍ No (0)

15. Do you believe that parents should allow children to make most of their own decisions?
- ❍ Yes (0)
- ❍ No (1)

16. Do you feel that when you do something wrong, there's very little that you can do to make it right?
- ❍ Yes (1)
- ❍ No (0)

17. Do you think that most people are just born good at sports?
- ❍ Yes (1)
- ❍ No (0)

18. Are most people your age and sex stronger than you are?
- ❍ Yes (1)
- ❍ No (0)

19. Do you feel that one of the best ways to handle problems is just not to think about them?
- ❍ Yes (1)
- ❍ No (0)

20. Do you feel that you have a lot of choice in deciding whom your friends are?
- ❍ Yes (0)
- ❍ No (1)

21. If you find a four-leaf clover, do you think it might bring you good luck?
- ❍ Yes (1)
- ❍ No (0)

22. Do you often feel that whether or not you do your homework has much to do with what kind of grades you get?
- ❍ Yes (0)
- ❍ No (1)

23. Do you feel that when a person your age is angry at you, there's little you can do to stop him or her?
- ❍ Yes (1)
- ❍ No (0)

24. Have you ever had a good-luck charm?
- ❍ Yes (1)
- ❍ No (0)

25. Do you believe that whether or not people like you depends on how you act?
- ❍ Yes (0)
- ❍ No (1)

26. Do your parents usually help you if you ask them to?
- ❍ Yes (0)
- ❍ No (1)

27. Have you felt that when people were angry with you, it was usually for no reason at all?
- ❍ Yes (1)
- ❍ No (0)

28. Most of the time, do you feel that you can change what might happen tomorrow by what you do today?
- ❍ Yes (0)
- ❍ No (1)

29. Do you believe that when bad things are going to happen they are just going to happen no matter what you try to do to stop them?
- ❍ Yes (1)
- ❍ No (0)

30. Do you think people can get their own way if they just keep trying?
- ❍ Yes (0)
- ❍ No (1)

31. Most of the time, do you find it useless to try and get your own way at home?
- ❍ Yes (1)
- ❍ No (0)

32. Most of the time, do you feel that when good things happen, they happen because of hard work?
- ❍ Yes (0)
- ❍ No (1)

33. Do you feel that when somebody your age wants to be your enemy, there's little you can do to change matters?
- ❍ Yes (1)
- ❍ No (0)

34. Do you feel that it's easy to get friends to do what you want them to do?
- ❍ Yes (0)
- ❍ No (1)

35. Do you feel that you usually have little to say about what you get to eat at home?
- ❍ Yes (1)
- ❍ No (0)

36. Do you feel that when someone doesn't like you, there's little you can do about it?
- ❍ Yes (1)
- ❍ No (0)

37. Do you usually feel that it is useless to try in school because most other students are just plain smarter than you?
- ❍ Yes (1)
- ❍ No (0)

38. Are you the kind of person who believes that planning ahead makes things turn out better?
- ❍ Yes (0)
- ❍ No (1)

39. Most of the time, do you feel that you have little to say about what your family decides to do?
- ❍ Yes (1)
- ❍ No (0)

40. Do you think it's better to be smart than to be lucky?
- ❍ Yes (0)
- ❍ No (1)

v. **Social Desirability Scale**

Marlowe-Crowne Social Desirability Scale
M-C SDS

Items

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is *true* or *false* as it pertains to you personally.

1. Before voting I thoroughly investigate the qualifications of all the candidates. (T)
2. I never hesitate to go out of my way to help someone in trouble. (T)
3. It is sometimes hard for me to go on with my work if I am not encouraged. (F)
4. I have never intensely disliked anyone. (T)
5. On occasion I have had doubts about my ability to succeed in life. (F)
6. I sometimes feel resentful when I don't get my way. (F)
7. I am always careful about my manner of dress. (T)
8. My table manners at home are as good as when I eat out in a restaurant. (T)
9. If I could get into a movie without paying and be sure I was not seen I would probably do it. (F)
10. On a few occasions, I have given up doing something because I thought too little of my ability. (F)
11. I like to gossip at times. (F)
12. There have been times when I felt like rebelling against people in authority even though I knew they were right. (F)
13. No matter who I'm talking to, I'm always a good listener. (T)
14. I can remember "playing sick" to get out of something. (F)
15. There have been occasions when I took advantage of someone. (F)
16. I'm always willing to admit it when I make a mistake. (T)
17. I always try to practice what I preach. (T)
18. I don't find it particularly difficult to get along with loud mouthed, obnoxious people. (T)
19. I sometimes try to get even rather than forgive and forget. (F)
20. When I don't know something I don't at all mind admitting it. (T)
21. I am always courteous, even to people who are disagreeable. (T)
22. At times I have really insisted on having things my own way. (F)
23. There have been occasions when I felt like smashing things. (F)
24. I would never think of letting someone else be punished for my wrongdoings. (T)
25. I never resent being asked to return a favor. (T)
26. I have never been irked when people expressed ideas very different from my own. (T)
27. I never make a long trip without checking the safety of my car. (T)
28. There have been times when I was quite jealous of the good fortune of others. (F)
29. I have almost never felt the urge to tell someone off. (T)
30. I am sometimes irritated by people who ask favors of me. (F)
31. I have never felt that I was punished without cause. (T)
32. I sometimes think when people have a misfortune they only got what they deserved. (F)
33. I have never deliberately said something that hurt someone's feelings. (T)

Note. The socially desirable response for each item is shown in parentheses; T = true; F = false.

Appendix B

"Reading the Mind in the Eyes" Test Adaptation. The original test includes 36 questions that ask the participant to view a picture of eyes and out of four options choose the emotion they think is best expressed in the photo. A selection of 12 questions rated as having a high degree of difficulty were chosen for the experimental group. Accurate feedback on performance was to be given. The control group had a selection of questions with an assorted rated degree of difficulty, also followed by accurate feedback on their responses. After the first portion of the task, participants filled out a mood scale and answered questions such as "Given training, how much better do you think you would become at reading people's emotions through their eyes?" on a scale from 1 (much worse) to 10 (much better). After this, there was a short training activity, followed by a second set of 12 questions of mixed difficulty, and finally, similar comparative questions as those asked after the first half. After piloting, it became evident that the task was not frustrating. Even with further manipulation of the task, it could not be made sufficiently frustrating, so the Ravensburger jigsaw puzzle task was devised. Both versions of this task were, however, retained for use by the control group.

Appendix C

Primary Variables and Covariates. As shown, socioeconomic status (SES) was shown to be negatively correlated with beliefs about the changeability of intelligence. Locus of control scores were negatively associated to both mindset about intelligence and overall mindset scores. GPA approached the threshold for significantly, negatively, correlating with beliefs about the changeability of intelligence.

Table 3 also provides bivariate correlations between potential confounds and personality traits. Locus of control was positively correlated with overall neuroticism, as well as both

volatility and withdrawal subsets. Additionally, locus of control was negatively correlated with the agreeableness compassion subscale, conscientiousness industriousness subscale, all three extraversion scores: (i.e. overall, enthusiasm, and assertiveness subscales), overall openness/intellect and the intellect subscale. Social desirability was also negatively correlated with all three neuroticism scores and positively correlated with overall agreeableness and the politeness subscale as well as average conscientiousness and its industriousness subscale. Gender was a positive correlate for all three neuroticism scores, and overall agreeableness. The openness/intellect subscale for intellect was also positively correlated with GPA and the openness subscale was negatively correlated with SES.

Table 3 additionally provides bivariate correlations between potential confounds and parenting behaviors. Father care scores were negatively correlated with locus of control and positively correlated with SES. Father control/overprotection scores were positively correlated with year in college, and almost significantly negatively correlated with social desirability. Mother care scores were also negatively correlated with locus of control as were mother control/overprotection scores positively correlated with year in college.

Possible confounds for frustration scores were also assessed. Year in school was negatively correlated with frustration.

Appendix D

Personality as a Moderator. We conducted a moderation analysis (Baron & Kenny, 1986) with mother control as the x –variable, mindset about intelligence as the y- variable, and neuroticism withdrawal as the proposed moderator. Before conducting our analysis, in other to ease interpretation, we mean-centered mother control and neuroticism withdrawal. We used the product of the two mean-centered variables as our interaction term. To test whether neuroticism

withdrawal significantly moderated the effect of mother control on mindset about intelligence, we conducted a step-wise regression analysis. In the first step, we entered mean-centered mother control and mean- centered neuroticism withdrawal as predictors of mindset about intelligence. In the second step, we added the interaction term to the equation. Adding the interaction term to the equation did not significantly increase the variability in y explained by the regression formula, R^2 change = .00, F (1,80) = .015, p = .902. Therefore, the neurotic withdrawal personality trait does not moderate the relationship between mother control and beliefs about the changeability of intelligence.