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Self-Assessed Emotion Recognition Skill and Social Adjustment among College Students

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An abstract of
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Abstract

Self-Assessed Emotion Recognition Skill and Social Adjustment among College Students

By Rachel J. Ammirati, M.A.

Models of social information processing suggest that a variety of perceptual and cognitive skills may interact to influence a person's level of social adjustment (Crick & Dodge, 1994). Although research has demonstrated that the ability to accurately recognize emotional cues is important for successful social adjustment (Nowicki, 2013; Rosenthal et al., 1979), it is not yet known how the level of awareness of one's own emotion recognition skill contributes to this association. That is the purpose of the present study. Participants were 158 male and female college students who provided self-ratings of their own facial and vocal emotion recognition skill, personality characteristics, and feelings of loneliness and connectedness to the social environment. Participants' facial and vocal emotion recognition skill was assessed via the Diagnostic Analysis of Nonverbal Accuracy, second edition (DANVA2), and their likability was rated by their peers. Consistent with predictions, results indicated that self-rated and performance measures of emotion recognition skill were not correlated strongly. When the relation between self-rated and performance measures of emotion recognition skill was further examined, some patterns consistent with the Dunning-Kruger effect (Dunning, 2011) emerged, such that the poorest performers overestimated their actual skills in contrast to top performers who underestimated their actual skills. Findings also suggested that more inaccurate self-ratings of actual facial emotion recognition skill (i.e., larger discrepancies between actual and self-rated performance) were associated with poorer social adjustment, even after controlling for relevant personality characteristics and performance on the DANVA2. However, this latter finding emerged only for men. It was concluded that future research should focus on why awareness of one's own emotion recognition skill may be more important for men.

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Self-Assessed Emotion Recognition Skill and Social Adjustment among College Students

The importance of nonverbal communication for social relationships is well-documented (Giles & Le Poire, 2006; Herba & Phillips, 2004; Knapp & Hall, 2009; Nowicki, 2008; Roter & Hall, 2006). Even the ability to recognize very basic emotions in the expressions of others has implications for social adjustment (e.g., Goodfellow & Nowicki, 2009). Various theories that differ in complexity and focus have been posited to understand the nature of the link between nonverbal information processing and social adjustment (e.g., Bandura, 1977; Crick & Dodge, 1994; Ladd & Crick, 1989; Lemerise & Arsenio, 2000; Selman, Beardslee, Schultz, Krupa, & Podorefsky, 1986; Weiner, 1985), and most theories pay at least some explicit attention to the importance of emotion recognition skill in particular. In line with cognitive models of psychopathology (David, Lynn, & Ellis, 2010), theories of social information processing also suggest that people's awareness of their own, and others', social skills impacts behavioral and emotional reactions that bear implications for the formation and maintenance of social relationships. However, scientists interested in the link between emotion recognition skill and social adjustment know very little about how people tend to perceive their ability to recognize emotions in the nonverbal behaviors of others, including the implications of these perceptions for social adjustment. Therefore, the purpose of this study was to begin to fill in these gaps in the literature.

Social Information Processing Theories and Social Adjustment

Typically, models of social information processing stress that a variety of social-cognitive variables may impact interpersonal behaviors that are, in turn, associated with various indices of social adjustment (e.g., having friends; being liked by others). Thus,

although basic social skills like emotion recognition ability are important in the formation and maintenance of interpersonal relationships, the way that we think about our own, and others', skills in social situations also is important. For example, although two people may be equally skilled at recognizing the facial expressions of others, it is possible that one may have an accurate sense of how good he is at this social skill, whereas the other believes he is poor at recognizing facial expressions. Although the person with the accurate self-assessment may trust the information he is picking up from his social partners and subsequently enact appropriate behavioral responses (e.g., immediately mimicking his sister's sad facial expression to communicate empathy), the other may doubt his senses and therefore enact inappropriate behaviors that are likely to lead to social problems (e.g., looking confused, rather than empathic, because he isn't sure if his appraisal of his colleague's facial expression is correct).

In their 2010 review, Erdley, Rivera, Shepherd, and Holleb described a variety of social information processing models that influence research on social adjustment. In particular, they emphasized the importance of Crick and Dodge's (1994) reformulated model, as it is among the most prominent social information processing models with more than 3000 citations on Google Scholar alone. According to Crick and Dodge, inaccurate ideas about one's level of emotion recognition skill may impact what happens in subsequent stages of social information processing (i.e., there may be shifts in one's "clarification of goals," or "response decision"; p. 76). Specifically, Crick and Dodge's social information processing model consists of 6 steps: "(1) encoding of external and internal cues, (2) interpretation and mental representation of those cues, (3) clarification or selection of a goal, (4) response access or construction, (5) response decision, and (6)

behavioral enactment" (p. 76). To date, most emotion recognition researchers interested in social adjustment have focused on the first step of Crick and Dodge's model – i.e., the implications of recognition of external interpersonal cues, like facial expressions, for social adjustment. However, the second step of this model implies that the *interpretation of cues* is also important in shaping how one ultimately behaves in a social situation, which in turn impacts social adjustment. In particular, Crick and Dodge highlight self- and other-evaluations as potential cognitive processes that can impact social outcomes.

Clarifying the Construct of Social Adjustment

"Social adjustment" is a broad construct that is defined and measured in a variety of ways across studies (Cavell, 1990; Crick & Dodge, 1994). For Crick and Dodge, who have focused much of their research on children, social adjustment is defined as "the degree to which children get along with their peers; the degree to which they engage in adaptive, competent social behavior; and the extent to which they inhibit aversive, incompetent behavior" (p. 82). Similarly, Cavell (1990) conceptualizes social adjustment as the degree to which one achieves goals that are sanctioned by society, and suggests that it can be measured in terms of "social (e.g., peer status), emotional (e.g., self-concept, others' global judgments), familial (e.g., make-up, degree of cohesion), and relational (e.g., quality of friendships, dating frequency)" outcomes (p. 118). For Cavell, who has articulated one of the most cogent definitions of social adjustment, the construct includes, most importantly, "value-laden indicators of age-appropriate achievements" (p. 117), and is distinct from the related construct of social skills (e.g., emotion recognition skill). Thus, although specific indices of social adjustment can (and do) vary across studies, most researchers seem to be concerned with the degree to which individuals

attain goals that are considered to be important, and developmentally-appropriate, in the greater social world. When considering the developmental tasks that young college students face, the formation and maintenance of relationships with peers is certainly among the most important (Hartup & Stevens, 1999; Roisman, Masten, Coatsworth, & Tellegen, 2004).

The Relation between Emotion Recognition Skill and Social Adjustment

Consistent with models of social information processing, research suggests that emotion recognition skill and social adjustment are correlated, such that better emotion recognition skill is typically associated with better social adjustment (e.g., Elfenbein, Der Foo, White, Tan, & Aik, 2007). Scientists who study emotion recognition skill are generally interested in measuring individual differences in the ability to accurately identify emotions in the nonverbal expressions of others (Bänziger, Grandjean, & Scherer, 2009), which is considered to be a facet of higher-order constructs like emotional intelligence (Mayer & Salovey, 1997; Mayer, Salovey, & Caruso, 2008) and emotional competence (Scherer, 2007; 2009).

Research on the importance of emotion recognition skill for social adjustment has tended to focus on facial expressions. Although emotions can certainly be communicated via other nonverbal channels (e.g., vocal expressions; Bänziger et al., 2009; Johnson, Emde, Scherer, & Klinnert, 1986), the face, traditionally, has been considered our principal instrument of nonverbal communication (Collier, 1985; Fridlund & Russell, 2006; Tremblay, Kirouac, & Dore, 1987). In line with this, scientists have demonstrated that individuals of various ages who experience interpersonal impairment as part of their psychopathology (e.g., social anxiety) make more facial emotion recognition errors than

typical controls (McClure & Nowicki, 2001; McClure, Pope, Hoberman, Pine, & Leibenluft, 2003; Mueser et al., 1996). Similarly, other research has shown that the *degree* of social impairment within clinical samples is linked to facial emotion recognition deficits (Hofer et al., 2009; Hooker & Park, 2002; Mueser et al., 1996). Research with typical samples has also revealed that being unskilled in facial emotion recognition is associated with less and lower quality social support (Ciarrochi, Heaven, & Supavadeeprasit, 2008), poorer social outcomes in the workplace (Byron, Terranova, & Nowicki, 2007; Elfenbein, Foo, White, Tan, & Aik, 2007), lower levels of popularity (Collins & Nowicki, 2001; Edwards, Manstead, & MacDonald, 1984; Nowicki & Duke, 1992, 1994; Vosk, Forehand, & Figueroa, 1983), lower levels of observer-rated social competence (Custrini & Feldman, 1989), lower levels of peer acceptance (Carson, Burks, & Parke, 1993), lower sociometric status (Field & Walden, 1982; Parke et al., 1989; for null findings see Gottman, Gonso, & Rasmussen, 1975; Spence, 1987), and lower levels of likability (Wilcox & Nowicki, 2007; Wilcox, Rothman, Kleinman, & Nowicki, 2008).

In comparison to research on facial expressions, a relatively small amount of burgeoning research also suggests that the ability to identify emotions in vocal expressions is important for social adjustment (Baum & Nowicki, 1998; Leppänen & Hietanen, 2001; McClure & Nowicki, 2001; as reviewed in Nowicki, 2008; Nowicki et al., in press). Given that vocal expressions also assist us in the communication of our intentions and emotional states (Baum & Nowicki, 1998), a relationship of this nature is not surprising. Even Darwin (1872) highlighted the ability of the vocal channel to communicate emotions. Therefore, given increasing calls among researchers to acknowledge the multimodal nature of nonverbal communication (e.g., Aviezer, Trope,

& Todorov, 2012; Bänziger et al., 2009; Scherer & Ellgring, 2007), additional research on the importance of vocal expression recognition for social adjustment is warranted.

Research on Self-Assessed Emotion Recognition Skill

Most emotion researchers rely on performance measures of recognition skill; therefore, very little is known about whether people are aware of how good, or bad, they are at recognizing emotions. However, some researchers have studied participants' perceptions of their emotion recognition abilities in particular (Hall, Gaul, & Kent, 1999), and emotional intelligence more broadly (Brackett, Rivers, Shiffman, Lerner, & Salovey, 2006). Hall and colleagues (1999) asked college students to participate in a standardized emotion recognition test which used the faces of children and adults as stimuli. They also asked students to indicate "how well they felt they perceived nonverbal cues" on a 5-point scale that ranged from "very accurate" to "not very accurate at all" (participants also had the option of "unable to judge my ability in this area"; (p. 766). Correlations between perceptions and performance were not statistically significant (r = -.04 for adult faces, and r = -.05 for child faces), suggesting that overall, individuals were not very accurate at judging their actual level of facial emotion recognition skill. If discrepancies between actual and self-assessed emotion recognition skill do exist, Crick and Dodge's (1994) social information processing theory would predict that they are important for social adjustment.

In a similar study, Brackett and colleagues (2006) asked undergraduate students to estimate their performance relative to their peers on a measure of emotional intelligence (the Mayer-Salovey-Caruso Emotional Intelligence Test, or MSCEIT, which includes a measure of facial expression recognition; Mayer, Salovey, & Caruso, 2002a, 2002b).

Students provided performance estimates both before and after administration of the emotional intelligence measure by filling in the statement, "I think I would perform [did perform] better than __% of all other students at the university on a test that measured my understanding of emotion concepts and the complexity of emotion" (p. 783). Ratings were made on an 11-point scale in increments of 10 ranging from 0% to 100%. Students also rated themselves relative to all other male and female students, although ultimately, these gender-based ratings did not differ significantly. Consistent with the findings of Hall, Gaul, and Kent (1999), results suggested that overall, the relation between actual and estimated emotional intelligence was either nonexistent or small in magnitude (e.g., r = .12 for the estimate made before the MSCEIT was given, and r = .03 for the estimate made afterwards).

The Dunning-Kruger Effect and Self-Assessed Emotion Recognition Skill

Brackett, Rivers, Shiffman, Lerner, and Salovey (2006) also examined whether comparative estimates (i.e., estimated percentile ranks) of emotional intelligence might differ based on participants' actual level of performance on the MSCEIT. Using research on the "Dunning-Kruger Effect" (Dunning, 2011) as a guide, they predicted that participants who scored higher on the MSCEIT would have more accurate perceptions of their emotional abilities. Consistent with research in this area (e.g., Dunning, Johnson, Ehrlinger & Kruger, 2003), the authors divided participants' into quartile groups based on their actual MSCEIT performance and conducted a repeated measures Multivariate Analysis of Variance (MANOVA) that included actual and estimated MSCEIT scores as a within-subjects factor. After noting the statistically significant quartile by measure interaction, their follow-up analyses showed that participants with higher scores on the

MSCEIT were not more accurate. Rather, students who demonstrated the least skill on the MSCEIT (i.e., bottom two quartiles) tended to overestimate perceptions of their actual performance both before and after the test, whereas individuals with more skill (i.e., the top two quartiles) tended to underestimate their performance. Thus, regardless of their actual level of MSCEIT performance, most participants lacked awareness of how good, or bad, their emotional intelligence was. Nevertheless, the nature of this ignorance did differ by MSCEIT performance level, such that higher performers underestimated their skills, and lower performers overestimated their skills.

Research on the Dunning-Kruger effect has generally focused on findings that demonstrate that the poorest performers across a range of social and intellectual domains tend to greatly overestimate their abilities. Empirical research has shown that poor performers tend to overestimate their abilities because they are plagued by a "double curse" (Ehrlinger, Johnson, Banner, Dunning, & Kruger, 2008, p. 99) – namely, that they lack the skills necessary to be able to identify their incompetence. Some research in this domain, however, has also shown that top performers are not completely immune to also making errors when self-assessing their skills. Although they, on average, tend to be much more accurate than the poorest performers, some studies show that they sometimes underestimate their abilities, particularly when providing comparative self-assessments that require comparing themselves to their peers. As additional empirical research has shown (for reviews of this research, see Dunning, 2011 and Ehrlinger et al., 2008), the mechanism that gives rise to estimation errors at the top end is different than that at the bottom end. Specifically, as Kruger and Dunning (1999) postulated, top performers tend to underestimate their skills because they find tasks to be easy, and therefore erroneously

assume that others must find them to be easy as well. Thus, although poor performers tend to greatly overestimate their skill when asked to make both absolute and comparative estimates, top performers typically show more underestimation when making comparative estimates.

Although the Dunning-Kruger effect is certainly a robust finding, notable criticisms have surfaced in the literature. For example, Krueger and Mueller (2002) suggested that the effect arises merely as a result of regression to the mean and a tendency for most people to report that they are above average. In addition, they also suggested that measurement error contributes to this finding because as Ehrlinger and colleagues (2008) noted, "unreliability would ensure a smaller correlation between perceptions and the reality of performance" (p. 100). Burson, Larrick, and Klayman (2006) have also suggested that the difficulty of tasks, rather than deficits in metacognition, accounts for why people will tend to over- or underestimate their performance. Specifically, they argued that tasks considered easy would tend to be associated with overestimation of skill, whereas tasks considered difficult would tend to be associated with underestimation. Research aimed at testing these alternative explanations for the Dunning-Kruger effect indicates that there is some merit to the assertions of Krueger and Mueller (2002) and Burson, Larrick, and Klayman (2006). However, through their own research, Ehrlinger and colleagues (2008) have demonstrated that while factors such as measurement error and perceived task difficulty can impact the magnitude and direction of self-assessment errors in relatively extreme cases, these factors do not explain all of the variance in awareness of one's own skill. Rather, even after taking these alternative explanations (i.e., measurement error and

perceived task difficulty) into account, lack of insight, particularly for those who perform most poorly on a task, still explains a substantial portion of the variance in awareness of one's own skill.

Self-Assessed Emotion Recognition Skill and Social Adjustment

In addition to examining whether participants' actual level of MSCEIT performance predicted how accurate their estimates of emotional intelligence were, Bracket, Rivers, Shiffman, Lerner, and Salovey (2006) also investigated whether estimated performance on the MSCEIT would predict scores on indices of social adjustment. While controlling for variables such as personality characteristics, well-being, and verbal intelligence, they found that better performance on the MSCEIT predicted more appropriate self-reported responses to positive and negative interpersonal scenarios, better observer-rated performance in a brief interpersonal interaction, and the tendency to be rated as more engaging, socially competent, and team-oriented. Estimated emotional intelligence, on the other hand, was not a significant predictor of social adjustment variables. The authors also found that gender acted as a moderator of the relation between actual scores on the measure of emotional intelligence and social adjustment, such that statistically significant correlations only emerged for men.

Although Brackett and colleagues' work suggests that self-assessed emotional intelligence does not predict social adjustment, it does not address whether *awareness* of one's emotion abilities is important for social adjustment. Specifically, Crick and Dodge's (1994) model stresses that social information processing occurs in stages that build on one another, with the interpretation of cues (e.g., evaluating one's own emotion recognition ability) following the encoding of cues (e.g., recognition of facial

expressions) in interpersonal situations. These steps then interact with one another to shape behavior that then impacts how others feel about us. Thus, Crick and Dodge's model suggests that the *discrepancy* between actual and estimated (i.e., self-assessed) emotion abilities should predict social adjustment. Since over- or underestimations of emotional abilities could each lead to the enactment of socially inappropriate behaviors, it seems possible that either could lead to poorer social adjustment.

In summary, preliminary evidence suggests that the accuracy of self-assessed emotion abilities, as well as the nature of that accuracy, may vary as a function of one's actual skill level. These findings are consistent with social psychological research that finds that individuals who perform poorly on a variety of tasks tend to overestimate their performance, whereas those who perform very well sometimes underestimate their performance (Dunning, 2011). However, the only study that specifically examined the Dunning-Kruger effect in emotion research used a broad measure of emotional intelligence that included not only an assessment of facial expression recognition, but also assessments of other higher-level skills thought to be pertinent to the broader construct of emotional intelligence (Mayer et al., 2008). Thus, it remains unclear whether the social psychological work on the faulty self-assessments of the unskilled actually generalizes to work on more basic facets of emotional intelligence, such as facial or vocal expression recognition. Further, it also unclear whether awareness of one's emotion recognition skill (i.e., the degree of discrepancy between actual and estimated performance) predicts social adjustment, including whether it would add to statistical models that use only performance measures of emotion recognition as predictors.

Personality and Self-Assessed Emotion Recognition Skill

Although alternative explanations for differences between actual and estimated levels of skill have generally been refuted (Ehrlinger, Johnson, Banner, Dunning, & Kruger, 2008), there is some evidence that individual differences in narcissism, rather than skill level *per se*, may also help to explain why some people over- or underestimate their performance more than others (John & Robins, 1994). Specifically, individuals higher in narcissism may tend to overestimate their emotion recognition ability because they are prone to providing higher (or more favorable) self-assessments of their skills, whereas those low in narcissism may be less likely to do so. Similarly, research on the negative cognitions associated with high levels of neuroticism, and in turn depression (Kercher, Rapee, & Schniering, 2009), suggests that those high in neuroticism may tend to underestimate their emotion recognition ability because they are prone to providing lower (or more negative) self-assessments of their skills. Thus, the potential impact of narcissism and neuroticism on estimates of emotion recognition skill was addressed in this study.

Measurement of Emotion Recognition Skill in This Study

As was stated previously, scientists have increasingly begun to emphasize the multimodal nature of the nonverbal communication of emotions (Bänziger et al., 2009; Scherer & Ellgring, 2007). Indeed, given the prevalence of cell phone use among adolescents and young adults (e.g., Walsh, White, Cox, & Young, 2011), for example, it would seem that any investigation of the importance of emotion recognition for social adjustment should also consider vocal expressions. Therefore, in an effort to define emotion recognition skill more broadly than it is typically, this study examined both facial and vocal expression recognition. In addition, because facial and vocal expression

recognition skills has been found to vary by participant gender (e.g., Goodfellow & Nowicki, 2009), with females generally demonstrating better emotion recognition skill than males, gender was considered in all major analyses.

Measurement of Social Adjustment in This Study

Nowicki and Duke (2002) suggest that social relationships are characterized by four stages: *choice*, *beginning*, *deepening*, and *ending*. They also suggest that both verbal and nonverbal communication skills are necessary in order to move from one stage to another. Therefore, if individuals wish to begin and deepen relationships, they must first be chosen as relationship partners. Along with others interested in social adjustment (e.g., Mounts, Valentiner, Anderson, & Boswell, 2006), Nowicki and Duke emphasize the particular importance of the choice stage during late adolescence and young adulthood, highlighting that "nowhere is the process of choosing with whom to begin a relationship more obvious than at the beginning of the school year at college" (p. 47). Thus, when considering the social adjustment of young college students, a focus on the choice stage of Nowicki and Duke's proposed relationship process seemed particularly appropriate. Cillessen and Rose (2005) remind us that in line with Nowicki and Duke's (2002) relationship model, being liked, or in some cases being popular, often affords individuals more opportunities for social support, friendships, and romantic relationships. Further, individuals who are liked tend to also have higher-quality friendships (Cillessen & Rose, 2005). Therefore, psychologists interested in the sociometric elements of social adjustment have often employed measures of likability in their research (Lease, Musgrove, & Axelrod, 2002). Therefore, information on peer-rated likeability was gathered as one index of social adjustment in this study. Additional indices of social

adjustment included self-reported loneliness and perceived connectedness to one's social environment.

Measurement of Self-Assessed Emotion Recognition Skill in This Study

To date, participants who provide researchers with self-assessments of their skill generally do so by simply estimating their own performance (i.e., a raw score) on a particular measure (e.g., Dunning et al., 2003), or by estimating their own performance in comparison to a reference group (e.g., a peer group) with a percentile rank (e.g., Brackett et al., 2006; Dunning et al., 2003). Therefore, the accuracy of self-assessments can be judged by comparing participants' estimates to their actual raw scores and percentile ranks. Both absolute (i.e., raw score) and comparative (i.e., performance relative to peers) estimates were collected in this study.

Summary of Study Purpose and Hypotheses/Questions Addressed

The primary purpose of this study was to extend the emotion recognition and social adjustment association to include broader social psychological measures of self-assessment (Dunning et al., 2004). Acknowledging the potential of self-cognitions to provide a more nuanced understanding of the emotion recognition-social adjustment relation is in line with influential models of social adjustment (e.g., Crick & Dodge, 1994), as well as with the extensive clinical literature that documents the role of cognitions about the self (and self in relation to others) in emotional experience and behavior (Beck, 1988).

Second, this study also aimed to add to our burgeoning understanding of the role of emotion recognition during the initial stages of social relationships (Nowicki & Duke, 2002). Aside from Wilcox, Rothman, Kleinman, and Nowicki (2008) and Wilcox and

Nowicki (2007), researchers have generally neglected to assess the possibility that emotion recognition skill may be more or less important at different points in a relationship. Therefore, the use of peer likability ratings among unacquainted college students provides an index of social adjustment that addresses this gap. In addition, the dual focus on faces and voices as nonverbal communication channels also contributed to the relatively scarce literature that has examined the importance of vocal expression recognition for social adjustment.

In summary, the following hypotheses guided this study:

1. Overall, the statistical relationship between estimated and performance measures of emotion recognition skill will be small in magnitude.

2a. The "Dunning-Kruger Effect" will be observed for emotion recognition skill, such that for comparative estimates, the lowest performers on a measure of emotion recognition skill will overestimate their performance, whereas the highest performers will underestimate their performance. For absolute estimates, the lowest performers will overestimate their performance, whereas the highest performers will show little, if any, underestimation.

2b. Personality dimensions such as narcissism and neuroticism will explain significant variance in participants' estimates of their emotion recognition skill. Specifically, higher levels of narcissism, and lower levels of neuroticism, will be associated with higher estimates of emotion recognition skill.

3. Participants' awareness of their emotion recognition skill will predict their social adjustment, such that (1) larger discrepancies between actual and estimated

performance will be associated with poorer social adjustment, and will add incremental validity to statistical models that use actual emotion recognition performance to predict social adjustment; and (2) over- or under-estimating one's emotion recognition skill, versus being accurate in terms of awareness of one's emotion recognition skill, will be associated with poorer social adjustment.

Method

Participants

Participants were 158 undergraduate college students (68% female) currently attending Emory University, a private school located in Atlanta, GA. Students were recruited through the introductory psychology research pool (86%) and an upper-level psychology course on child development (14%). Participants from the introductory psychology research pool received course credit for their participation, and participants from the course on child development received extra credit. The mean age of participants was 19.22 years (*SD* = 1.08), and 39% reported that they were freshmen, 31% sophomores, 21% juniors, and 9% seniors. The majority of students identified psychology as at least one of their majors (41%), whereas other students were non-psychology majors (39%) or undecided (20%). Regarding race and ethnicity, 51% identified as "White or Caucasian," 26% as "Asian," 8% as "Black or African American," 8% as multiple races or ethnicities, 5% as "other," and 2% as "Hispanic or Latino." Participants' demographic information is also summarized in Table 1.

Measures

Emotion recognition skill. Participants completed the adult faces (DANVA2-F) and voices (referred to as the DANVA2-V in this study; typically referred to as the

DANVA2-P for "paralanguage"; Baum & Nowicki, 1998) subtests of the Diagnostic Analysis of Nonverbal Accuracy, Second Edition (DANVA2; Nowicki, 2013; Nowicki & Duke, 1994). The DANVA2-F subtest consists of 24 photographs of mostly Caucasian, college-aged young adult male and female faces expressing high and low intensity happiness, sadness, anger and fear. Each emotion is depicted in 6 photographs with equal numbers of high and low intensity expressions. The adult faces subtest can be administered individually on a computer or to a group using a projector. When administered to a group, each face is projected onto a screen for 1 or 2 seconds. For the present study, a 1 second exposure time was used in order to make the distribution of scores more normal, rather than negatively skewed as is typically the case (Nowicki, 2013). Participants are then asked to choose among the 4 possible emotion choices – happy, sad, angry or fearful – to decide which emotion best describes each facial expression, and responses are recorded on a response form. Stimuli are never re-administered and participants are urged to answer quickly. Scores can then be calculated to determine how many correct responses a participant provides overall (maximum total score = 24).

The DANVA2-V subtest can also be administered to a group. Like the DANVA2-F, this subtest requires participants to identify four basic emotions – happy, sad, angry, and fearful – at low and high intensities. Participants listen to a recording of adult male and female actors reading the same neutral sentence, *"I am going out of the room now but I'll be back later,"* 24 times. They are then given a few seconds to indicate which emotion they believe the actor was communicating. Here again, stimuli are never re-

administered, and scores like those calculated for the DANVA2-F can also be calculated for the DANVA2-V.

In addition to the typical DANVA2 administration directions, participants were also instructed to given confidence ratings for each of their answers. Specifically, they were instructed to do so by "quickly going with [their] gut feeling" after answering an item. This was done to ascertain information concerning participants' perceptions of the difficulty of the subtests of the DANVA2. Confidence ratings were made based on a scale of 1 to 4, with 1 = "not confident", 2 = "somewhat not confident", 3 = "somewhat confident", and 4 = "confident." The mean confidence rating for DANVA2-F and DANVA2-V items was 3.21 (*SD* = .32) and 3.18 (*SD* = .36) respectively.

Nearly 500 studies have used the DANVA2 (Nowicki, 2013) and construct validity and reliability evidence has been ascertained in a variety of ways. For the DANVA2-F, coefficient alphas have been reported to range between .77 and .90 among young adults (McIntire, Danforth, & Schneider, 1997; Nowicki & Carton, 1993), and correlations reflecting test-retest reliability have been reported to range between .81 and .84 (McIntire, Danforth, & Schneider, 1997; Nowicki & Carton, 1993). In this study, however, the internal consistency for the DANVA2-F was low ($\alpha = .26$). When inter-item correlations among items were examined, it was determined that they all contributed equally to the low internal consistency of the DANVA2-F. Convergent and discriminant validity evidence for the DANVA2-F is also available. Specifically, the subtest correlates significantly ($r = .80$) with the Japanese and Caucasian Facial Expressions of Emotion test (JACFEE; Matsumoto & Ekman, 1989) among young adults, but not with measures of general cognitive ability (Nowicki, 1995).

Similar data exist for the DANVA2-V. Coefficient alphas have been reported to range between .75 and .78 among adults (Baum, Diforio, Tomlinson, Vega, & Walker, 1995; Nowicki, 1995), and correlations reflecting test-retest reliability range between .73 and .93 (Nowicki, 1995; Spell, 1996). In this study, however, the internal consistency for the DANVA2-V was low ($\alpha = .08$). Here again, when inter-item correlations among items were examined, it was determined that they all contributed equally to the low internal consistency of the DANVA2-V. Further, some convergent and discriminant validity evidence has also been reported, such that the DANVA2-V correlates significantly with the child voices subtest of the DANVA2 ($r = .31$; Nowicki, 1995), but not with a general measure of cognitive ability (Baum, 1997).

In this study, the correlation between DANVA2-F and DANVA2-V performance was small in magnitude ($r = .13$, $p < .05$) overall. When separated by gender, the correlation for males remained small in magnitude but was statistically non-significant ($r = .23$, p = n.s.) due to a relatively small sample size ($n = 50$). For females, there was no statistically significant correlation between DANVA2-F and DANVA2-V performance ($r = .08$, p = n.s.). Therefore, all analyses examined these indices of emotion recognition ability separately.

Self-assessed emotion recognition skill. Participants were asked to provide absolute (i.e., raw score) and comparative (i.e., compare self to peers) estimates of their performance on a measure of emotion recognition skill (i.e., the DANVA2). Procedures outlined by Brackett, Rivers, Shiffman, Lerner, and Salovey (2006) and Dunning, Johnson, Ehrlinger, and Kruger (2003), in addition to the feedback of undergraduate

students who participated in a pilot study, were used as guides in the creation of these self-report measures.

For absolute estimates, participants circled a percentage that indicated how many correct responses they thought they would make/made on measures of facial and vocal emotion recognition. Percentages that corresponded to possible raw scores, rather than the possible raw scores themselves, were presented as choices in order to not give away information about the number of each kind of emotion on the subtests of the DANVA2 since standard DANVA2 instructions do not reveal this information. Although estimates were obtained for individual emotions as well (i.e., happy, sad, angry, and fearful faces and voices), they were not a focus of this study.

For comparative estimates of emotion recognition skill, participants were asked to compare themselves to their university peers by indicating whether their performance on measures of facial and vocal expression recognition would be/was "*extremely below average*; *below average*; *average*; *above average*; or *extremely above average*." Since Brackett, Rivers, Shiffman, Lerner, and Salovey (2006) found that the gender of the comparison group did not impact participants' estimates of their emotional intelligence, participants in this study were asked to compare themselves to peers in general, rather than to female and male peers separately. Although previous researchers have tended to ask participants to compare themselves to peers by estimating their percentile ranks on a scale of 0% to 100% (e.g., Dunning, Johnson, Ehrlinger, & Kruger, 2003; Kruger & Dunning, 1999), or in intervals of 10% on an 11-point scale (e.g., Brackett, Rivers, Shiffman, Lerner, & Salovey, 2006), to make the task easier, and possibly more meaningful for participants, they were asked to identify with a relatively small number of

ranked categories that are commonly referred to in everyday life. Each of these categories were separated into one of five ranked percentile groups (i.e., *extremely below average* = lowest 20%; *below average* = next lowest 20%; *average* = middle 20%; *above average* = next highest 20%; and *extremely above average* = highest 20%) reflecting actual DANVA2 performance. Participants provided estimates before and after DANVA2 administration.

Please see Appendices A – H for the wording of instructions and items on all emotion recognition skill self-assessment forms. Questionnaires 1 – 4 (Appendices A – D) were filled out prior to DANVA2 administration, and questionnaires 5 – 8 (Appendices E – H) were filled out afterwards.

Social adjustment. Participants completed three measures of social adjustment: the Reysen Likability Scale (RLS; Reysen, 2005); the UCLA Loneliness Scale (Russell, Peplau, & Ferguson, 1978); and a 15-item version (Lee, Dean, & Jung, 2008) of the Social Connectedness Scale (Lee & Robbins, 1995).

Peer-rated likability, as measured by the Reysen Likability Scale (RLS; Reysen, 2005), served as one index of social adjustment. The RLS is a relatively recent, observer-rated measure of a target person's likability. It consists of 11 statements that are rated on a 7-point likert scale ranging from "very strongly disagree" to "very strongly agree." All items are positively scored (Maximum score = 77), and higher scores indicate greater likability. Example items include, "this person is friendly; I would like this person as a roommate; I would like to be friends with this person; and this person in likeable." Distracter items were also included on this form in order to lessen the chances that participants would recognize that it was a measure of likability.

Coefficient alphas reflecting the internal consistency of items have been found to range between .90 and .91, and convergent validity has been preliminarily demonstrated in regard to the finding that the nature of laughter (e.g., genuine, faked, or no laughter) predicts ratings of likability in the expected direction (i.e., individuals laughing genuinely receive the highest likability scores; Reysen, 2005; 2006).

Although research on the RLS is still in its infancy, it possesses characteristics that made it desirable for this study. For example, many existing studies of likability utilize single-item measures (e.g., do you like a target person?), whereas the RLS has 11 items. As McIver and Carmines (1981) have noted, "It is very unlikely that a single item can fully represent a complex theoretical concept or any specific attribute" (p.15). Since single-item measures are often less reliable and valid than multi-item measures, the RLS is an improvement over typical likability measures. Further, in addition to indicating how likable a target person is, participants also indicate how desirable that person is for friendship, as a co-worker, and as a roommate. Thus, it also provides information on whether a target person is desired for relationships that are relevant for college students. Finally, the RLS also contains items that assess variables known to correlate with likability (e.g., physical attraction and perceived similarity).

For this study, summary likability scores were calculated by averaging the total likability score given by each rater, and only ratings coming from unacquainted partners were included. Of the 319 RLS forms completed by participants, 46 (14%) were excluded because the rater indicated knowing the person prior to involvement in this study.

Ultimately, likability scores were generated for 141 participants. Although I had intended to use Kenny's (1998) Social Relations Model to compute likability scores that accounted for actor, partner, and relationship effects on ratings, the vast majority of participants did not have enough data to estimate the parameters of this model (i.e., at least 4 people in the interaction group). Likability scores were generated by taking the average of interaction partners' ratings in cases where there was more than 1 rating for a participant. Of the 141 likability scores, 51 were based on only 1 rating, 47 were based on 2 ratings, and 43 were based on 3 ratings. A one-way Welch analysis of variance (ANOVA) suggested there were no statistically significant differences between likability scores based on 1, 2, or 3 ratings, $F(2,81) = 0.94$ (p = n.s.). In addition, likability ratings were not impacted by whether dyads were composed of same- or mixed-sex participants (For the first set of RLS total scores, $t(54) = -1.69$, p = n.s.; For the second set of RLS total scores, $t(9.28) = 1.80$, p = n.s.; For the third set of RLS total scores, $t(54) = 0.64$, p = n.s.). For this study, the internal consistency for RLS total scores ranged between $\alpha = .88$ and $\alpha = .91$, and the internal consistency of the summary likability rating was moderate ($\alpha = .65$).

The third version (Russell, 1996) of the UCLA Loneliness scale (Russell, Peplau, & Ferguson, 1978) was administered to assess participants' subjective feelings of loneliness and social isolation. The measure includes 20 items (11 negatively-worded and 9 positively-worded) that are each rated on a 4-point scale (1 = never; 2 = rarely; 3 = sometimes; 4 = always). Example items include: "How often do you feel alone?; How often do you feel isolated from others?; How often do you feel close to people?;etc.". Total scores are equivalent to the sum of all ratings across the 20 items (after reverse

scoring positively-worded items), with higher scores indicating more loneliness (Maximum score = 80).

Research suggests that the UCLA Loneliness scale is highly reliable. Internal consistency estimates have been found to range between $\alpha = .89$ to $\alpha = .94$, and test-retest reliability (over a 1 year period) is strong ($r = .73$; Russell, 1996). For this study, the internal consistency of UCLA Loneliness items was also high ($\alpha = .92$). In support of convergent validity, the UCLA Loneliness has been found to correlate with the NYU Loneliness Scale ($r = .65$), the Differential Loneliness Scale ($r = .72$), and also with the Beck Depression Inventory ($r = .52$). Regarding discriminant validity, Russel, Kao, and Cutrona (1987) found that although measures of loneliness and social support tend to be highly correlated, the nature of their associations with measures of personality and mood is different.

Social connectedness was measured with a 15-item version (Lee, Dean, & Jung, 2008) of the revised Social Connectedness Scale (SCS; Lee & Robbins, 1995). According to Lee, Dean, and Jung, "social connectedness refers to a person's subjective awareness of being in close relationship with the social world in toto…as people satisfy their need for belonging and connection, they develop a stable, secure sense of connectedness…social connectedness is related to but distinct from feelings of loneliness and isolation" (p. 415). They also go on to describe the construct of social connectedness as, "a psychological sense of belonging, or how individuals cognitively construe interpersonal closeness with others in their social world" (p. 416). Items on the SCS are rated on a 6-point scale that ranges from 1 = "strongly disagree" to 6 = "strongly agree,"

and example items include: “I feel disconnected from the world around me;” and, “I am able to relate to my peers.”

The 15-item version of the SCS has been found to correlate significantly, and strongly, with the original 20-item SCS (r = .98), as well as with similar, but distinct, constructs (life satisfaction r = .50; positive affect r = .40; negative affect r = -.41; extraversion = .58; Lee, Dean, & Jung, 2008). The 15-item SCS also has high internal consistency (α = .93). For this study, the internal consistency of the SCS was also high (α = .93).

Correlations among the three indices of social adjustment, which were similar for male and female participants, are summarized in Table 2.

Personality. The Big Five Inventory (BFI; John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008) was administered to collect information about participants’ personality characteristics. Participants rate how much they agree (on a 5-point scale ranging from “disagree strongly” to “agree strongly”) with 44 self statements that can describe a person’s personality. Big Five domains include the following: Openness; Conscientiousness; Extraversion; Agreeableness; and Neuroticism. Scale scores are computed by first recoding items that are reverse-scored and next by finding the mean of items that comprise each scale. Higher scores reflect stronger characteristics associated with a particular personality domain.

The BFI has been found to correlate with the NEO-FFI (mean r = .73 across scales) and Goldberg’s Trait Descriptive Adjectives (Goldberg, 1990; mean r = .81), and its internal consistency is high (α = .83; John & Srivastava, 1999). In this study, the

internal consistency was high for all 44 items of the BFI (α = .78), as well as for each of the individual scales (Extraversion α = .86; Agreeableness α = .78; Conscientiousness α = .80; Neuroticism α = .84; Openness α = .78).

Narcissism. The Narcissistic Personality Inventory (NPI; Raskin & Terry, 1998) is a widely used measure of narcissistic personality traits and has been used primarily in non-clinical samples. It consists of 40 items and utilizes a forced-choice format for ratings. Participants are presented with 40 pairs of items and asked to choose one statement (from each pair) that describes them best. The endorsement of some items is indicative of narcissism, whereas the endorsement of others is not. Narcissism-related items are coded as 1, whereas non-narcissistic items are coded as 0. Therefore, scores can range between 0 and 40 with higher scores indicating more narcissism.

Ames et al. (2006) found that the internal consistency of the NPI was strong (α = .84). The internal consistency of the NPI in this study was similarly strong (α = .82). Ames and colleagues also found that the NPI was positively correlated with self-esteem (r = .38), but uncorrelated with belief in a just world (r = .06).

Demographics. Appendix I contains a copy of the demographics questionnaire that was given to participants. Participants were asked to indicate their gender, their current age in years, their current year in college, their current college major, and their racial/ethnic identity.

Procedure

Undergraduate students attending a private, urban university were recruited through introductory and upper-level psychology classes. Those recruited through

introductory classes received course credit for their participation, and those recruited through an advanced course focused on child development received extra credit for their participation. Students were permitted to sign up to participate in the study via the university's Sona System in groups of up to 4 people, and efforts were made to place students into same-sex groups. Most study sessions lasted for approximately 1 hour and 15 minutes.

Study sessions were divided into 5 parts. When all participants who signed up for a study session arrived at the study lab, they were greeted by the examiner or one of her research assistants. They were then each taken into individual rooms within the lab for privacy to initiate part 1 of the study. At this time, participants reviewed and signed the consent form, and they provided the following information by filling out paper-and-pencil measures: (1) basic demographic information (i.e., gender, age, year in college, college major, and racial/ethnic identity); (2) broad personality traits via the Big Five Inventory (BFI; John, Donahue, & Kentle, 1991; John, Naumann, & Soto, 2008); (3) narcissism via the Narcissistic Personality Inventory (NPI; Raskin & Terry, 1988); (4) social adjustment via the revised UCLA Loneliness Scale (Russell, 1996) and the 15-item version of the revised Social Connectedness Scale (SCS; Lee, Dean, & Jung, 2008); and (5) self-assessed emotion recognition skill via four separate forms created by the principal investigator. Participants were also given a sticker with their unique study number on it, and instructed to place it on their shirts. Participants wrote their study numbers on the top of all forms.

The second part of the study began after all participants completed their individual paperwork. At this time, participants came out of their private rooms to gather in the

common area of the lab. They were allowed to briefly introduce themselves to one another (i.e., say "hello" and give their first names). Each participant sat in a chair facing a blank screen and near a tape recorder. During part 2 of the study, participants were administered the DANVA2-F and DANVA2-V subtests. The order of these subtests was designated at random. Participants were spaced apart so that they were not able to see others' responses.

After finishing the DANVA2, participants began the third part of the study. At this time, they each returned to their individual rooms to again fill out four separate forms that asked them to assess their own emotion recognition skills. These forms were essentially the same as the first four they filled out, but with slight changes in wording to reflect the fact that they just taken a test of emotion recognition skill. These forms were also created by the principal investigator.

After completing the questionnaires, participants started the fourth part of the study. At this time, they were randomly assigned to engage in a 3-minute, one-on-one conversation with another participant. Conversations took place in separate rooms so that other participants could not hear other conversations. Participants had one conversation with all other participants, resulting in a maximum of 3 separate conversations per person. They were given the following discussion prompt at the beginning of each conversation: "*For the next 3 minutes, please talk about where you are each from. In addition to this, you might also talk about your likes and dislikes about your home towns, as well as how your home towns compare to Atlanta."* Pilot testing with undergraduates suggested that this discussion prompt was ecologically valid in that it generated discussion and seemed to be received well by the participants.

After each one-on-one conversation, participants then returned to a private room to fill out the Reysen Likability Scale (RLS; Reysen, 2005), along with some distracter items (e.g., "this person likes college"), about the individual with whom they just spoke. Individuals wrote the study identification number (and not the name) of the participant they were rating on the form, and they also indicated whether they knew the individual prior to meeting at the study session. Study identification numbers were displayed on all participants' name-badge stickers. Instructions on each RLS form reminded participants that their responses would be kept confidential.

Finally, during the fifth part of the study, all participants were debriefed fully regarding the nature of the study's components. Participants were also given an opportunity to ask questions.

In summary, participants completed the following measures during each part of the study: Part 1 = Demographics; NPI; BFI; UCLA Loneliness Scale; SCS; Pre-DANVA2-F Absolute Self-Assessment; Pre-DANVA2-V Absolute Self-Assessment; Pre-DANVA2-F Comparative Self-Assessment; Pre-DANVA2-V Comparative Self-Assessment → Part 2 = DANVA2-F and DANVA2-V → Part 3 = Post-DANVA2-F Absolute Self-Assessment; Post-DANVA2-V Absolute Self-Assessment; Post-DANVA2-F Comparative Self-Assessment; Post-DANVA2-V Comparative Self-Assessment → Part 4 = RLS.

Summary of Statistical Analyses

Distributions of all study variables were examined to check for outliers and assumptions of normality. In addition, the assumptions of various statistical tests were

evaluated by examining appropriate output generated by IBM SPSS Statistics (Version 20).

Hypothesis #1. Following the procedures of Brackett, Rivers, Shiffman, Lerner, and Salovey (2006), Pearson product-moment correlation coefficients were generated to examine the relationship between DANVA2 raw scores and absolute estimates of DANVA2 performance. To assess the relationship between actual and estimated DANVA2 performance relative to peers, Kendall's Tau-b coefficients were generated. In order to make participants' actual DANVA2 performance similar to their comparative estimates, an ordinal variable with 5 ranked percentile groups was created. Group 1 of this ordinal variable was identified as the lowest 20% in terms of DANVA2 performance, group 2 was identified as the next lowest 20%, and so on. Since correlation coefficients did not differ by gender, analyses include male and female participants together. Since a priori hypotheses guided these analyses, one-tailed significance tests ($\alpha = .05$) were used.

Hypothesis #2a. Similar to Brackett and colleagues (2006), a series of 3 (type of emotion recognition measure: DANVA2 performance; pre-estimate; post-estimate) x 3 (tertile group based on actual DANVA2 performance) repeated measures multivariate analyses of variance (MANOVA) were conducted to see if the interaction between type of emotion recognition measure and performance tertile group would be statistically significant. Repeated measures MANOVA models were used as a first step in evaluating hypothesis #2 in order to control for the possibility of Type I error associated with conducting numerous simple effects tests (Olson, 1976). Gender was initially entered into these analyses as an additional between-subjects factor. However, since it did not interact significantly with any of the performance tertile x emotion recognition measure

interactions, gender was ultimately excluded from these analyses. When interactions between performance tertile group and type of emotion recognition measure were statistically significant, follow-up tests of simple effects (i.e., dependent samples *t*-tests) were conducted to see if actual and estimated emotion recognition scores differed within each performance tertile group. Although research on the Dunning-Kruger effect has traditionally involved separating participants into performance quartiles (e.g., Brackett, Rivers, Shiffman, Lerner, & Salovey., 2006; Dunning, Johnson, Ehrlinger, & Kruger, 2003), participants in this study were separated into performance tertiles in order to maximize the *n* in each group.

Also in accordance with the methods of Brackett and colleagues (2006), for those analyses involving comparative estimates, emotion recognition measure scores (i.e., actual DANVA2 performance, pre-DANVA2 estimates, post-DANVA2 estimates) were standardized to facilitate comparison in repeated measures MANOVA models and dependent samples *t*-tests. For these analyses, peer estimates were treated as continuous variables (range = 1 – 5 prior to standardization). An alpha level of .05 was used for all analyses that addressed hypothesis #2.

Hypothesis #2b. To examine this sub-hypothesis, Pearson correlation and Kendall's Tau-b coefficients were first generated to see if narcissism and neuroticism total scores correlated significantly with estimated (and actual) measures of emotion recognition skill. When these coefficients were statistically significant, one-way analyses of variance (ANOVA) were conducted to see if DANVA2 performance tertile groups differed significantly in their levels of narcissism or neuroticism. When performance tertile groups did differ on a personality dimension (i.e., narcissism or neuroticism)

associated with at least one index of emotion recognition skill of interest, the dimension was added into appropriate, previously described repeated measures MANOVA models as a covariate to see if it eliminated any statistically significant performance tertile x emotion recognition measure interactions.

Hypothesis #3. For this portion of the study, "awareness" of one's emotion recognition ability was defined in two ways. First, a "magnitude-only" continuous variable was created to reflect the absolute value of discrepancies between actual and estimated emotion recognition skill. Larger discrepancies were considered to be indicative of less awareness of one's actual emotion recognition skill. Table 3 summarizes the names and descriptions of each of these variables, and explains how comparative estimates were handled. Second, a "direction-only" variable was also created, which involved subtracting participants' estimates from their actual DANVA2 scores, and then coding these values as belonging to one of three categories – underestimate (value < 1) vs. no discrepancy (value = 0) vs. overestimate (value > 1). The same variable name was used for corresponding direction-only and magnitude-only variables (see Table 3 for further detail).

To investigate the relation between the magnitude of discrepancy (between actual and estimated emotion recognition skill) and social adjustment, zero-order correlation coefficients were first generated. Next, hierarchical regression analyses were conducted separately for men and women. The first step of all analyses included personality variables being controlled for (i.e., personality variables that were associated with the social adjustment index of interest), and the second step included actual DANVA2 performance (either DANVA2-F or DANVA2-V total scores, depending on the nature of

the awareness variable being examined). The final step included the addition of the magnitude-only discrepancy variable. Of primary interest in regression analyses was whether this last step increased the amount of variance explained in the social adjustment index of interest (i.e., a statistically significant increase in R^2, $\alpha = .05$).

To investigate the potential importance of the direction of discrepancies (between actual and estimated emotion recognition skill) for social adjustment, factorial analyses of variance (ANOVA) were conducted. Factors in these analyses included a discrepancy direction grouping variable (i.e., underestimate, no discrepancy, or overestimate) and gender. Personality dimensions associated with the social adjustment variable of interest, and at least one factor, were included as covariates, and thus controlled for. When a main effect for discrepancy direction, or an interaction between discrepancy direction and gender was found, Tukey's post hoc tests were conducted to examine the nature of differences among groups.

Handling of Missing Data

Since missing data was not a major problem in this study, when a participant was missing data for a particular variable of interest, he/she was excluded from relevant statistical analyses.

On measures that asked participants to estimate their emotion recognition skill, a few individuals wrote in their own percentages, rather than circling one of the given options. When this occurred, the percentage choice that was closest to their response was used. In cases where a "made-up" percentage was exactly in the middle of two choices, one of these choices was chosen at random.

Results

Performance-Based Emotion Recognition Descriptive Statistics and Potential Gender Differences

Basic descriptive statistics pertaining to participants' performance on DANVA2-F and DANVA2-V are summarized in Table 4. Overall, men and women performed similarly on the subtests of the DANVA2. Additional analyses showed that participants, on average, accurately recognized more facial than vocal expressions on the DANVA2, $t(155) = 8.93$, $p < .001$, which was the case for both women, $t(105) = 8.93$, $p < .001$, and men, $t(49) = 3.23$, $p < .01$.

Self-Assessed Emotion Recognition Descriptive Statistics and Potential Gender Differences

Basic descriptive statistics pertaining to participants' estimated absolute (i.e., raw score) performance on the DANVA2 are summarized in Table 5. Men and women made similar estimates regarding their raw scores on the DANVA2, both before and after DANVA2 administration. Additional descriptive statistics pertaining to participants' estimated comparative (i.e. comparing self to peers) performance on the DANVA2 are summarized in Table 6. Here again, men and women made similar estimates both before and after DANVA2 administration.

Additional Descriptive Statistics for Key Study Variables and Potential Gender Differences

Means and standard deviations for social adjustment variables are summarized in Table 7. Overall, male and female participants reported similar mean levels of loneliness and social connectedness, and were rated similarly in terms of likability. Table 8

summarizes means and standard deviations for all personality variables. There were some gender differences. Specifically, female participants rated themselves as being higher in conscientiousness, $t(155) = 2.34$, $p < .05$, and neuroticism, $t(155) = 3.67$, $p < .01$ compared to men.

Test of Hypothesis #1

Consistent with this hypothesis, results showed that emotion recognition estimates, both absolute (i.e., estimated raw scores) and comparative (i.e., estimated performance relative to peers), were not related strongly to actual emotion recognition performance on the DANVA2 (see Table 9 for a summary of results pertaining to absolute estimates, and Table 10 for comparative estimates).

Regarding the relation between actual performance on the subtests of the DANVA2 (i.e., DANVA2-F and DANVA2-V) and absolute estimates made both before and after the DANVA2 was administered, Pearson correlation coefficients were small in magnitude but statistically significant ($r = .16$ - $.17$, $p < .05$). Thus, participants' awareness of their facial and vocal emotion recognition skill was minimal. Further, when separated by gender, *z*-tests showed that correlations were not significantly different between men and women. Paired-samples *t*-tests indicated that on average, participants underestimated their facial expression recognition skill both before, $t(154) = 3.80$, $p < .01$, and after, $t(154) = 10.13$, $p < .01$, DANVA2 administration. A similar pattern was found for estimates of vocal expression recognition skill, such that on average, participants underestimated their vocal expression recognition skill after DANVA2 administration, $t(157) = 6.08$, $p < .01$. Although mean estimates made prior to DANVA2 administration were also in the direction of underestimation, the difference was not

statistically significant, $t(157) = .47$, p = n.s. Finally, participants' absolute estimates of their facial, $t(155) = 6.36$, $p < .01$, and vocal, $t(157) = 5.96$, $p < .01$, expression recognition skill were lower, on average, after DANVA2 administration.

Regarding the relation between actual and estimated comparative performance on the facial and vocal expression recognition subtests of the DANVA2, Kendall's Tau-b coefficients similarly showed that overall, participants had little awareness of how they performed relative to their peers (T_b = -.01 - .19). In fact, only vocal expression recognition estimates made before DANVA2 administration were statistically significantly associated with actual performance on the DANVA2-V ($T_b = .19$, $p < .01$). *Z*-tests again showed that these correlations were not significantly different between men and women. A series of Wilcoxon signed rank tests indicated that on average, and prior to DANVA2 administration, participants rated themselves as being ranked more highly than they actually were for both facial ($Z = -4.44$, $p < .01$) and vocal ($Z = -3.14$, $p < .01$) expression recognition performance. After DANVA2 administration, there were not statistically significant differences between participants' actual and estimated facial and vocal expression recognition performance relative to their peers (Z = -1.64 and -.37 respectively, p = n.s.), although estimations overall were in the direction of overestimating one's rank relative to peers. Wilcoxon signed rank tests also confirmed that participants gave lower comparative estimates after DANVA2 administration for both facial ($Z = -5.62$, $p < .01$) and vocal ($Z = -4.97$, $p < .01$) expression recognition.

Test of Hypothesis #2a – Repeated Measures MANOVA Analyses

Table 11 summarizes the results of 3 (emotion recognition measure: DANVA2 actual score, pre-estimate, post-estimate) x 3 (actual performance tertile group) repeated

measures multivariate analyses of variance (MANOVA). Since there was a statistically significant tertile by emotion recognition measure interaction for all analyses conducted, follow-up simple effects tests were conducted to examine whether the Dunning-Kruger effect would be observed for absolute and comparative estimates of performance related to facial and vocal expression recognition on the DANVA2. Tables 12 – 15 summarize the results of these simple effects tests.

Test of Hypothesis #2a – Simple Effects Tests for Absolute (i.e., Raw Score) DANVA2-F Performance

Regarding absolute estimates of DANVA2-F raw scores (Table 12), simple effects tests showed that prior to DANVA2 administration, only the upper tertile group underestimated their performance, $t(63) = -5.24$, $p < .01$. For the lower and middle tertile groups, there were no statistically significant differences in actual and estimated means. However, after DANVA2 administration, all three groups underestimated their performance: For the lower tertile group, $t(57) = -4.30$, $p < .01$; For the middle tertile group, $t(31) = -2.83$, $p < .01$; For the upper tertile group, $t(64) = -10.59$, $p < .01$. Overall, these results were not consistent with the Dunning-Kruger effect.

Test of Hypothesis #2a – Simple Effects Tests for Absolute (i.e., Raw Score) DANVA2-V Performance

For absolute estimates of DANVA2-V raw scores (Table 13) made prior to DANVA2 administration, the lower tertile group overestimated their performance, $t(63) = 4.45$, $p < .01$, whereas the middle and upper tertile groups underestimated their performance (for middle tertile group, $t(51) = -2.16$, $p < .05$; for upper tertile group, $t(41) = -3.78$, $p < .01$). Thus, these results were largely consistent with the Dunning-Kruger

effect. After DANVA2 administration, members of the lower tertile group estimated their absolute performance on the DANVA2-V to be lower than they originally estimated, resulting in relatively accurate estimated performance as a group (p = n.s.). The middle and upper tertile groups, however, continued to underestimate their performance (for middle tertile group, $t(51) = -4.27$ $p < .01$; for upper tertile group, $t(41) = -6.01$, $p < .01$). These latter results were not consistent with the Dunning-Kruger effect.

Test of Hypothesis #2a – Simple Effects Tests for Comparative (i.e., Peer Comparison) DANVA2-F Performance

Regarding comparative estimates of DANVA2-F performance (Table 14) made both before and after DANVA2 administration, participants in the lower tertile group overestimated their performance (before DANVA2 administration, $t(58) = 6.63$, $p < .01$; after DANVA2 administration, $t(58) = 6.79$, $p < .01$), whereas participants in the upper tertile group underestimated their performance (before DANVA2 administration, $t(64) = -5.78$, $p < .01$; after DANVA2 administration, $t(64) = -5.89$, $p < .01$). Participants in the middle tertile group, however, were relatively accurate in their estimations overall (p = n.s.). These results were consistent with the Dunning-Kruger effect.

Test of Hypothesis #2a – Simple Effects Tests for Comparative (i.e., Peer Comparison) DANVA2-V Performance

For comparative estimates of DANVA2-V performance (Table 15) made prior to DANVA2 administration, tertile group membership did not predict variability in awareness of DANVA2-V performance relative to peers (p = n.s. for all t-tests). Rather, participants in each tertile group were, on average, relatively accurate in their estimations. However, after DANVA2 administration, results more consistent with the

Dunning-Kruger Effect emerged, such that participants in the lower tertile group overestimated their performance relative to peers, $t(58) = 2.71$, $p < .01$, whereas participants in the upper tertile group underestimated their performance, $t(64) = -2.49$, $p < .05$. Participants in the middle tertile group remained relatively accurate in their estimations (p = n.s.).

Test of Hypothesis #2a – Summary

Taken together, some elements consistent with the Dunning-Kruger effect were found across analyses and types of estimates (i.e., absolute and comparative), such that in some cases, the participants with the lowest DANVA2 scores overestimated their performance, whereas participants with the highest DANVA2 scores underestimated their performance. However, the finding that the highest tertile groups underestimated both their comparative and raw score performance, rather than just their raw score performance, was inconsistent with the Dunning-Kruger effect.

Test of Hypothesis #2b – Correlation Coefficients

To examine whether personality characteristics like narcissism and neuroticism might explain some of the variance in participants' estimates of their emotion recognition skill, Pearson and Kendall's Tau-b correlation coefficients were generated (Table 16). Neither DANVA2-F nor DANVA2-V actual performance was associated with levels of narcissism or neuroticism (r = -.02 − .11, p = n.s.). However, in contrast to a lack of association with absolute (i.e., raw score) estimates, higher levels of narcissism were associated with higher comparative (i.e., peer comparisons) estimates made both before and after DANVA2 administration. Specifically, and consistent with prediction, higher levels of narcissism were associated with making higher comparative estimates of

performance pertaining to the recognition of facial (for pre-DANVA2 estimates, T_b = .30, p < .01; for post-DANVA2 estimates, T_b = .24, p < .01) and vocal expressions (for pre-DANVA2 estimates, T_b = .24, p < .01; for post-DANVA2 estimates, T_b = .14, p < .01). Also consistent with prediction, lower levels of neuroticism were associated with making higher comparative estimates of vocal expression recognition made after DANVA2 administration (T_b = -.26, p < .01).

Research suggests that the general narcissism construct measured by the NPI includes seven related but distinct components (i.e., Superiority, Authority, Self-Sufficiency, Exhibitionism, Exploitativeness, Vanity, and Entitlement; Raskin & Terry, 1988). Since the Superiority component would be hypothesized to be associated most strongly with participants' estimates of their emotion recognition skill, Pearson and Kendall's Tau-b correlation coefficients were also generated to examine this possibility. Similar to findings summarized previously, higher levels of Superiority were associated with making higher comparative estimates of facial and vocal expression recognition both before and after DANVA2 administration (T_b = .13 - .25, p < .05 − .01). In addition, higher levels of Superiority were also associated with making higher absolute estimates of vocal expression recognition performance prior to DANVA2 administration (r = .17, p < .05), and higher absolute estimates of facial expression recognition performance after DANVA2 administration (r = .17, p < .05).

Test of Hypothesis #2b – One-way ANOVAs

Since narcissism was found to be associated with comparative estimates of facial and vocal expression recognition skill, DANVA-F and DANVA2-V performance tertile groups were compared on their levels of narcissism to see whether there were any

significant group differences in this personality characteristic that might contribute to group differences in emotion recognition skill awareness. One-way analyses of variance (ANOVA) showed that performance tertile groups did not differ in their levels of narcissism – for the DANVA2-F performance tertile group, $F(2, 147) = .30$, p = n.s.; for DANAV2-V performance tertile group, $F(2, 149) = .97$, p = n.s. Similar results were found when performance tertile groups were compared on their levels of the Superiority component of narcissism. Thus, narcissism was not entered as a covariate into previously described repeated measures MANOVAs.

Given the statistically significant association between comparative vocal expression recognitions estimates made after DANVA2 administration and levels of neuroticism, DANVA2-V performance tertile groups were also compared on their levels of neuroticism. This one-way ANOVA was statistically significant, $F(2, 154) = 3.29$, $p < .05$. Follow-up simple effects tests indicated that the middle tertile group had greater levels of neuroticism than the lower and upper tertile groups, but at an alpha level of .10.

Test of Hypothesis #2b – Controlling for Neuroticism When Testing Hypothesis #2a

A standardized version of neuroticism was entered into a 3 (emotion recognition measure: standardized actual DANVA2-V performance, standardized pre-DANVA2 comparative estimate, standardized post-DANVA2 comparative estimate) x 3 (performance tertile group) repeated measures MANOVA to examine whether the effect of actual performance level on emotion recognition skill awareness would hold when neuroticism was controlled for. Since the interaction between emotion recognition measure and tertile group remained statistically significant, $F(4, 306) = 26.55$, $p < .001$,

the effect of actual performance level continued to predict level of awareness even after controlling for neuroticism.

Test of Hypothesis #2b – Summary

In summary, although narcissism and neuroticism were significantly associated with some comparative (i.e., peer comparison) estimates of emotion recognition skill, the aforementioned results suggested that they did not weaken the Dunning-Kruger effect for emotion recognition skill.

Analyses Conducted Prior to Testing Hypothesis #3 – Relation between DANVA2 Performance and Social Adjustment

Prior to conducting analyses to evaluate the third hypothesis directly, zero-order correlation coefficients were generated to examine relations among DANVA2 actual performance scores and indices of social adjustment (summarized in Table 17). Higher DANVA2-F scores were associated with lower levels of loneliness for women (r = -.17, p < .05). Contrary to prediction, all other correlations were statistically non-significant (α = .05).

Analyses Conducted Prior to Testing Hypothesis #3 – Relation between Personality and Social Adjustment

Zero-order correlation coefficients were also generated to examine relations among personality dimensions and indices of social adjustment (summarized in Table 18), as well as relations among personality dimensions and DANVA2 performance variables (summarized in Table 19). For women, higher levels of loneliness were associated with lower levels of conscientiousness (r = -.41, p < .01), extraversion, (r = -.41, p < .01), agreeableness (r = -.28, p < .01), and narcissism (r = -.28, p < .01), but

higher levels of neuroticism (r = .34, p < .01). For men, a similar pattern of results emerged, such that higher levels of loneliness were associated with lower levels of conscientiousness (r = -.40, p < .01), extraversion (r = -.43, p < .01), agreeableness (r = -.57, p < .01), but higher levels of neuroticism (r = .42, p < .01). However, the correlation between narcissism and loneliness was not statistically significant for men. For women, higher levels of social connectedness were associated with higher levels of conscientiousness (r = .33, p < .01), extraversion (r = .34, p < .01), agreeableness (r = .22, p < .05), and narcissism (r = .24, p < .01), but lower levels of neuroticism (r = -.27, p < .01). Again, results were similar for men, with higher levels of social connectedness associated with higher levels of conscientiousness (r = .39, p < .01), extraversion (r = .52, p < .01), agreeableness (r = .47, p < .01), and narcissism (r = .29, p < .05), but lower levels of neuroticism (r = -.42, p < .01). Finally, for both men and women, likability was not statistically significantly associated with any personality dimensions.

Analyses Conducted Prior to Testing Hypothesis #3 – Relation between DANVA2 Performance and Personality

Regarding the relation between actual DANVA2 performance and personality (Table 19) for women, higher scores on the DANVA2-F were associated with lower levels of agreeableness (r = -.22, p < .05), and higher scores on the DANVA2-V were associated with lower levels of openness (r = -.20, p < .05). For men, personality was not statistically significantly associated with either subtest of the DANVA2.

Test of Hypothesis #3 – Descriptive Statistics

Descriptive statistics for emotion recognition skill awareness (i.e., discrepancy) variables are summarized in Tables 20 and 21. Table 20 provides information pertaining

to discrepancy scores when only the magnitude of the discrepancy (i.e., the absolute value of how far off a participants' estimate was from the actual DANVA2 performance score) is taken into account, and Table 21 provides information pertaining to discrepancy scores when only the direction of estimates (i.e., whether a participant over- or underestimated) is taken into account.

Test of Hypothesis #3 – Correlation Coefficients Reflecting the Relation between Magnitude-only Discrepancy Variables (i.e., Degree of Awareness, or "Accuracy") and Social Adjustment

Pearson correlation coefficients reflecting the relation between magnitude-only discrepancy variables and indices of social adjustment are summarized in Table 22. Consistent with predictions, and for women, larger discrepancies between actual DANVA2-F performance and the related absolute estimate made before DANVA2 administration (i.e., Pre-D Abs F) were associated with lower levels of social connectedness (r = -.18, p < .05). The same relation was also found for men (Pre-D Abs F, r = -.25, p < .05). In addition, discrepancies that were larger in magnitude for Post-D Comp F (i.e., the discrepancy between actual DANVA2-F comparative performance and the related comparative estimate made after DANVA2-administration) for men, were associated with higher levels of loneliness (r = .32, p < .05), and lower levels of social connectedness (r = -.38, p < .01). Thus, these findings provide some preliminary support for the hypothesis that less awareness of one's emotion recognition skill (i.e., discrepancies between actual and estimated performance) would be associated with poorer social adjustment. In addition, awareness of facial expression recognition skill

may be more important than awareness of vocal expression recognition skill for social adjustment.

Test of Hypothesis #3 – Relation between Personality and Magnitude-only Discrepancy Variables (i.e., Degree of Awareness, or "Accuracy")

Prior to computing regression analyses, correlation coefficients reflecting the relation between personality dimensions and magnitude-only discrepancy variables were also generated to inform which personality dimensions should be added as control variables (for a summary of associations, see Table 23). Decisions about control variables were also informed by the results of previously mentioned correlational analyses summarized in Table 18 (i.e., correlations among personality dimensions and social adjustment variables).

Test of Hypothesis #3 – Regression Analyses Examining Incremental Validity

The results of hierarchical regression analyses involving magnitude-only discrepancy variables are summarized in Tables 24 – 47. Since twenty four regression analyses were computed, it is important to note that the risk of Type I error was high. Nevertheless, results showed that in some cases, after controlling for personality and actual DANAV2 performance, the addition of awareness of facial emotion recognition skill did add incremental validity (i.e., a statistically significant change in R^2), but only for males. Specifically, the results of the hierarchical regression analysis reported in Table 28 indicated that for men, the inclusion of conscientiousness, extraversion, agreeableness, neuroticism, narcissism, DANVA2-F performance, and Pre-D Comp F (i.e., the absolute value of the magnitude of the discrepancy between actual DANVA2-F comparative performance and comparative DANVA2-F estimates of performance made

prior to DANVA2 administration) explained 61% of the variance in social connectedness (R^2 = .61, F(1,41) = 6.97, p < .05). Notably, although DANVA2-F performance did not significantly predict social connectedness (β = -.09, p = n.s.), Pre-D Comp F did (β = -.34, p < .05), adding 6% of the variance to the model upon its addition (ΔR^2 = .06, p < .05). In another regression analysis, conscientiousness, extraversion, agreeableness, neuroticism, narcissism, DANVA2-F performance, and Post-D Comp F (i.e., the absolute value of the magnitude of the discrepancy between actual DANVA2-F comparative performance and comparative DANVA2-F estimates of performance made after DANVA2 administration) explained 64% of the variance in loneliness for men (R^2= .64, F(1, 41) = 11.96). The addition of Post-D Comp F added an additional 10% to the model (β = .40, p < .01), whereas actual DANVA2-F performance did not significantly contribute to the model (β = .10, p = n.s.). Finally, in an additional regression analysis (Table 40), conscientiousness, extraversion, agreeableness, neuroticism, narcissism, DANVA2-F performance, and Post-D Comp F explained 64% of the variance in social connectedness for men (R^2 = .64, F(1, 41) = 10.30, p < .01). Here again, although actual DANVA2-F performance did not significantly predict social connectedness (β = -.09, p = n.s.), Post-D Comp F did (β = -.38, p < .01), and contributed to 9% of the variance in social connectedness.

Test of Hypothesis #3 – Excluding Personality Characteristics in Regression Analyses Examining Incremental Validity

Since it was possible that including personality characteristics as control variables in the analyses summarized previously may have masked the relation between magnitude-only discrepancy variables and social adjustment indices, hierarchical

regression analyses that controlled only for actual DANVA2 performance were also conducted separately for men and women. Although the exclusion of personality characteristics did not alter results substantially, a few differences were noted. Specifically, and for men only, when personality characteristics were excluded from hierarchical regression analyses originally summarized in Table 27, DANVA2-F performance and Pre-D Comp F alone now explained 13% of the variance in loneliness (R^2 = .13, $F(2, 47) = 3.41$, $p < .05$). Although actual DANVA2-F performance did not significantly predict loneliness (β = .17, p = n.s), Pre-D Comp F did in the expected direction (β = .40, $p < .05$).

Further, regarding the results of hierarchical regression analyses for men summarized in Table 28, when personality characteristics were excluded, the addition of Pre-D Comp F to a model that included only DANVA2-F performance as a predictor of social connectedness resulted in a statistically significant R^2 change of 13% ($p < .05$). As Table 28 indicates, when personality characteristics were included in the model, the addition of Pre-D Comp F added only .06 ($p < .05$) to the total R^2. Similarly, regarding results summarized in Table 39, when personality characteristics were excluded, the addition of Post-D Comp F to a model including only DANVA2-F performance as a predictor of loneliness resulted in a statistically significant R^2 change of 20% ($p < .01$). When personality characteristics had been included in the model, the addition of Post-D Comp F added only .10 ($p < .05$) to the total R^2. Finally, regarding results summarized in Table 40, when personality characteristics were excluded again, the addition of Post-D Comp F to a model including only DANVA2-F performance as a predictor of social connectedness resulted in a statistically significant R^2 change of 22% ($p < .01$). When

personality had been included in the model, the addition of Post-D Comp F added only .09 ($p < .01$) to the total R^2.

Test of Hypothesis #3 – Summary Related to Incremental Validity of Awareness of Emotion Recognition Skill in the Form of a Magnitude-Only Discrepancy Variable

Thus, preliminary evidence suggested that for men, information about absolute and comparative awareness of facial expression recognition skill may add incremental validity in the prediction of social adjustment.

Test of Hypothesis #3 – Awareness of Emotion Recognition Skill in the Form of a Direction-Only Discrepancy Variable

Tables 48 – 55 summarize the results of factorial ANOVAs that examined whether overestimating, underestimating, or having no discrepancy between actual and estimated DANVA2 performance was associated with social adjustment. Results showed that after controlling for relevant personality dimensions, the direction of discrepancies did not predict social adjustment in most cases. However, as indicated in Table 48, the interaction between gender and Pre-D Abs F (i.e., the direction of the discrepancy between actual DANVA2-F absolute performance and absolute DANVA2-F estimates of performance made prior to DANVA2 administration) was statistically significant when likability was the index of social adjustment, $F(2, 132) = 4.92$, $p < .01$. Subsequent post hoc tests of simple effects showed that although there were no group differences in likability for females, for males, under- and over-estimating, compared to no discrepancy, were similarly associated with lower likability ratings. Group means and standard deviations were as follows: underestimate group, $M = 51.73$, $SD = 5.01$; overestimate group, $M = 50.62$, $SD = 3.42$; no discrepancy group, $M = 57.22$, $SD = 4.93$.

As shown in Table 52, the main effect of Post-D Abs F (i.e., the direction of the discrepancy between actual DANVA2-F absolute performance and absolute DANVA2-F estimates of performance made after DANVA2 administration) on likability was also statistically significant, $F(2, 132) = 3.88$, $p < .05$. Post hoc tests of simple effects showed that neither over- nor under-estimating groups differed significantly from the no discrepancy group ($M = 52.12$, $SD = 5.34$). However, under- and overestimating groups did differ significantly from one another in their reported levels of likability, with participants in the underestimating group reporting higher levels of likability ($M = 52.43$, $SD = 5.58$) than the overestimating group ($M = 49.19$, $SD = 4.25$).

Test of Hypothesis #3 – Summary Related to Awareness of Emotion Recognition Skill in the Form of a Direction-Only Discrepancy Variable

In summary, the aforementioned results indicated that the direction of discrepancies did not predict social adjustment in most cases. However, some preliminary evidence did emerge to suggest that for men, overestimating one's facial expression recognition skill may be associated with less peer-rated likability than underestimating.

Discussion

Hypothesis #1: Self-Assessed and Performance-Based Emotion Recognition Skill

Consistent with a small body of extant research (Brackett, Rivers, Shiffman, Lerner, & Salovey, 2006; Hall, Gaul, & Kent, 1999), and the claims of some emotion researchers (Nowicki & Duke, 2002), self-assessed and performance measures of emotion recognition skill were not associated strongly. This was the case for both facial and vocal emotion recognition skill, and for both absolute and comparative self-assessments as well. Participants, on average, demonstrated minimal awareness of their

emotion recognition abilities, and thus were not very accurate in their estimations. When considered alongside a larger body of psychological research which suggests that people are often poor at providing accurate self-reports of their abilities (Dunning, 2005; Dunning, Heath, & Suls, 2004; Falchikov & Boud, 1989; Mabe & West, 1982), this finding is not surprising.

There are a variety of potential explanations for why people lack awareness of their emotion recognition skill. As Brackett and colleagues (2006), and Nowicki and Duke (2012) have suggested, people may lack awareness of their emotion recognition skill because it is something that is neither formally taught nor evaluated, and so individuals receive no direct feedback concerning their abilities. Indeed, aside from possible early conversations with our parents about emotions (Fivush, Brotman, Buckner, & Goodman, 2000), it is rare for people to talk about the extent to which they are able to pick up on emotions accurately. Brackett and colleagues even noted that in their study of self-reported and performance measures of emotional intelligence – a broader construct that includes emotion recognition skill as one of multiple facets – the correlation between self-reported and performance measures of verbal intelligence was stronger than that for measures of emotional intelligence. Since essential elements of verbal intelligence are taught and tested directly in preschool through college academic settings, Brackett and colleagues suggested that individuals may have many more opportunities for feedback about their strengths and weaknesses involving this skill.

It is also important to address the potential role that measurement error may have played when attempting to understand the lack of strong association between self-assessed and performance measures of emotion recognition skill in this study. As

Krueger and Mueller (2002), and to some degree, Ehrlinger, Johnson, Banner, Dunning, and Kruger (2008) have noted as well, the unreliability (e.g., low internal consistency) of measures can reduce the strength of correlations between self-reports and performance indices of skill. Since the internal consistency estimates of the two performance measures of emotion recognition skill used in this study (i.e., the DANVA2-F and DANVA2-V) were low, it is likely that this may have contributed to less correspondence between self-assessed and performance-based emotion recognition skill. Thus, perhaps with more internally consistent measures, the association may be stronger. Nevertheless, as Hall (2001) highlighted in her review of the psychometric properties of commonly used tests of nonverbal decoding skills, it is not uncommon for these measures to have weak internal consistencies. Further, she also argued that weak internal consistencies are not always clear indicators of random error since measures with weak internal consistencies can still have moderate to strong test-retest reliability and predictive validity.

Regarding awareness of emotion recognition skill among participants in this study, it was found that the overall tendency was for both male and female participants to underestimate their self-rated absolute performance on measures of facial and vocal emotion recognition skill, but to overestimate, at least prior to DANVA2 administration, their comparative estimates related to peers. The former finding runs counter to the large body of research on the better-than-average-effect (Alicke & Govorun, 2005), whereas the latter finding is more consistent with it. For absolute estimates in particular, it is possible that perceived task difficulty may have impacted self-assessments (Burson, Larrick, & Klayman, 2006). Since the average confidence rating for DANVA2-F and DANVA2-V items was 3.21 (*SD* = .32) and 3.18 (*SD* = .36) respectively, and a

confidence rating of 3 corresponded to feeling only "somewhat confident" about a response, absolute underestimates made after DANVA2 administration (which were lower than estimates made prior to DANVA2 administration) suggest participants perceived the DANVA2 as somewhat difficult, whereas underestimates made beforehand may be related to a more general sense that reading others' emotions is difficult because it is a process that often occurs outside of awareness (Nowicki & Duke, 1994).

Hypothesis #2: Emotion Recognition Skill and the Dunning-Kruger Effect

Partial support for the Dunning-Kruger effect related to awareness of emotion recognition skill was found in this study. Regarding absolute estimates of DANVA2-F and DANVA2-V performance, a tendency to underestimate facial and vocal expression recognition skill was observed across groups, regardless of performance level. This finding may be related, at least in part, to the fact that although DANVA2-F and DANVA2-V scores were normally distributed, they were distributed at the upper end of the range of potential scores (i.e., 0 to 24) that one can obtain on the DANVA2. Thus, even the poorest performers obtained DANVA2 scores that were relatively high. Had a more difficult test of emotion recognition been administered, such that the average scores distinguishing top and bottom performers formed a wider distribution, a pattern of awareness more consistent with the Dunning-Kruger effect may have emerged. Attempts were made to create a wider distribution of scores by decreasing the exposure time of DANVA2-F stimuli from two seconds to one second, but this may not have had the intended impact. Perhaps the use of less static test stimuli, unlike those that characterize the DANVA2, would also increase the variance in scores. In addition, recruiting a sample

that varied more in age and/or racial background may have also impacted the distribution of scores. Future researchers should seek to investigate these possibilities.

Although the lowest DANVA2-V performance group did overestimate its absolute performance on the DANVA2-V prior to DANVA2 administration, the overestimations of this group, on average, were not nearly as great as is typically seen with the Dunning-Kruger effect. Further, the top DANVA2-V performance group also underestimated their absolute DANVA2-V performance both before and after DANVA2 administration, which is somewhat surprising when considered in the context of research findings related to the Dunning-Kruger effect which has found that underestimation for top performers more often occurs when comparative, rather than absolute, estimates are made. Such a pattern usually occurs because researchers suggest that individuals assume erroneously that since a task is easy for them, it will also be relatively easy for others. A similar pattern of results was found for absolute estimates of DANVA2-F performance, although the lowest performing DANVA2-F group's slight tendency for overestimation did not reach statistical significance. However, unlike findings related to the DANVA2-V, the lowest and middle DANVA2-F performance tertiles were more accurate in their absolute estimations (i.e., actual and estimated performance means were not significantly different at $\alpha = .05$) made prior to DANVA2 administration than the upper tertile group, which is also inconsistent with the Dunning-Kruger effect. Here again, perceived task difficulty (Burson, Larrick, & Klayman, 2006) may have impacted this pattern of results as well, such that lower performing groups did not overestimate their performance as much as they would have on a task perceived as somewhat easier, and top performers tended to underestimate their performance even though the process of making absolute

estimates did not involve comparing oneself to others. To ascertain information concerning the impact of task difficulty on self-assessments in future research, the directions on self-assessment forms could possibly be manipulated so that some described emotion recognition as an “easy” task, whereas others described it as a “difficult” task.

Regarding comparative estimates that required participants to think about themselves in relation to their peers, results were more consistent with the Dunning-Kruger effect, and also with the findings of Brackett and colleagues (2006) who only utilized peer-based comparative estimates to gauge awareness of emotional intelligence. Although actual performance level did not predict awareness of DANVA2-V comparative performance prior to DANVA2 administration, it did after DANVA2 administration, such that the Dunning-Kruger effect was observed (i.e., the lowest performers overestimated their DANVA2-V performance relative to peers, the middle group was relatively accurate, and the top performers underestimated their performance relative to peers). For comparative peer-based estimates of facial expressions, the Dunning-Kruger effect was observed both before and after DANVA2 administration.

In summary, perceiving the subtests of the DANVA2 as somewhat difficult may have caused participants to underestimate their performance, on average, when thinking about their own skills in isolation from those of their peers. Alternatively, making comparative estimates that involved considering the performance of peers may have forced them to think beyond the difficulty of the task, thus allowing the Dunning-Kruger effect to emerge. Future researchers may need to include multiple measures of emotion

recognition skill that vary in perceived difficulty to examine how much it impacts participants' expectations about their performance.

Hypothesis #2a: Narcissism, Neuroticism, and Self-Assessed Emotion Recognition Skill

An additional aim of this study was to examine whether personality characteristics like narcissism (typically associated with overconfidence) and neuroticism (typically associated with thinking negatively about oneself and others) would be associated with estimates of emotion recognition skill, and if so, whether controlling for narcissism or neuroticism would eliminate or weaken the Dunning-Kruger effect. Consistent with existing research on narcissism and self-assessment (John & Robins, 1994), this study found some evidence that higher levels of narcissism were associated with making higher estimates of one's comparative performance on the DANVA2-F and DANVA2-V. In addition, some preliminary evidence emerged to suggest that at least for comparative estimates of vocal expression recognition performance, higher levels of neuroticism were associated with making lower estimates of one's comparative performance. However, controlling for these personality dimensions in relevant analyses did not alter findings. Thus, for researchers interested in investigating the Dunning-Kruger effect as it pertains to emotion recognition skill, controlling for narcissism and neuroticism may not be essential. However, it should be noted that since the items that contribute to the neuroticism scale on the BFI do not ask for information about negative cognitions *per se*, but rather for information about physiological and mood states typically associated with depression and anxiety, it is possible that a related but more cognitive-oriented measure, like a scale focused on ruminative responses (e.g., Treynor, Gonzalez, & Nolen-Hoeksema, 2003), might produce results more consistent with

predictions. In fact, there are also a host of other personality measures that may impact individuals' estimates of their emotion recognition skill. For example, a construct such as locus of control of reinforcement that measures expectancies for problem solving success and the connection between one's behavior and outcomes would be a promising candidate. In addition, the degree to which participants value a particular skill might also affect their estimations (e.g., individuals might rate themselves more highly for skills that they value as important for a particular outcome).

Hypothesis #3: Emotion Recognition Skill Awareness and Social Adjustment

Partial support for the third hypothesis – that information concerning peoples' awareness of their emotion recognition skill would add additional variance to the prediction of social adjustment – was found in this study, and thus was consistent with Crick and Dodge's (1994) influential model of social information processing. Given the significant impact that cognitive theory has had on research in clinical psychology, it is important for emotion recognition researchers to move beyond the measurement of simple perception of emotion, and to consider how people evaluate their social skills when attempting to predict social adjustment. An extensive body of research documents the role of thoughts about the self and others in emotional experiences and behavior (Beck, 1988), and a growing number of social psychological studies suggest individual differences in the ability to accurately assess one's own skill level in a variety of domains (e.g., Dunning, Heath, & Suls, 2004). Thus, to move research concerned with emotion recognition and social outcomes forward, we need to be thinking about thinking.

The present investigation was unique in attempting to ascertain the impact of differing levels of awareness of emotion recognition skill on social outcomes. Given its

exploratory nature, many analyses were conducted with the goal of potentially identifying findings that could inform future research directions. Unfortunately, a tradeoff of such an approach is the higher probability of Type I error. Thus, statistically significant findings must be considered carefully. With these caveats in mind, it appeared that significant patterns did emerge for males regarding their awareness of their facial expression recognition skill.

In three instances, poorer awareness of one's facial expression recognition skill in the form of larger discrepancies between actual and estimated comparative performance was significantly associated with poorer social adjustment (i.e., loneliness and social connectedness) for males. Further, in two additional hierarchical regression analyses that included awareness of facial expression recognition skill as a predictor of likability and loneliness, the addition of an awareness variable added marginally significant variance to the model for males. In each of these hierarchical regression analyses, awareness of facial expression recognition skill was a better predictor of social adjustment than actual DANVA2 performance was, which is consistent with Crick and Dodge's (1994) model of social information processing that posits that the way we think about social cues, and not just the social cues themselves, impacts our social adjustment. Although their model would not predict that awareness of social skill should be differentially important for males and females, the results of this study are similar to the findings of Brackett and colleagues (2006), and other studies that have found that emotion-related skills are related to social functioning for one gender, but not the other (e.g., Brackett, Mayer, & Warner, 2004; Custrini & Feldman, 1989; Eisenberg, Fabes, Murphy, Maszk, Smith, & Karbon, 1995). Indeed, in this study as well, although zero-order correlation coefficients

reflecting the relation between DANVA2 performance and social adjustment outcomes did not reach statistical significance for men, the size and pattern of correlations, relative to those for women, indicated that emotion recognition skill may be more important for men than women. In their attempt to understand why a performance measure of emotional intelligence (i.e., the MSCEIT) was predictive of social functioning for men, but not women, Brackett and colleagues (2006) suggested that, "emotions operate within social norms, and the norms governing appropriate gendered behavior for men and women are different." (p. 791). They also speculated that their measure of emotional intelligence, "may be biased in that it better assesses the emotional abilities of men (and thus better predicts relevant social outcomes for men), but it may not capture the abilities of women adequately (and thus is not related to social outcomes for women)." (p. 791). Since women are generally considered to be more adept at processing emotional information than men (Simon & Nath, 2004), it is possible that emotional abilities more complex than emotion recognition skill (e.g., capacity for emotion regulation) may be more predictive of social outcomes for women, whereas more basic skills (i.e., emotion recognition; Gross, 2003) are more predictive for men.

In addition, there was some evidence to suggest that for males, overestimating, rather than underestimating, one's facial expression recognition skills may lead to being less liked by peers. However, here again, it is important to note that out of twenty four factorial ANOVAs conducted, only one analysis showed that participants who over- and underestimated their skills differed significantly from those with no discrepancy between their actual and estimated DANVA2 performance in terms of social adjustment. Thus, this finding could be spurious. Nevertheless, if future research did show that

overestimating, rather than underestimating one's skill is in fact more problematic for social adjustment, it may be because individuals who overestimate their skill would be less likely to adjust their subsequent behaviors in an interpersonal interaction because they assume that they are not contributing substantially to interpersonal problems arising from miscommunication. Indeed, as Bagley, Abramowitz, and Kosson (2009) noted in their study of affect recognition among psychopaths (who frequently report moderately high levels of narcissism; Paulhus & Williams, 2002), "[b]ecause they have difficulty understanding the emotional impact of their actions for themselves or others, they do not learn to modify their behaviors on the basis of their emotional consequences (Cleckley, 1941)" (p. 388). Individuals who underestimate their skill, however, may be more likely to seek feedback from a social partner since they would assume that they are contributing to miscommunication.

Conclusions and Limitations of the Present Study

Various elements of this study bear implications for its external validity. First, most measures of key constructs have been found to be highly reliable, widely used and well-validated in related research. Thus, the use of measures like the DANVA2, the UCLA Loneliness Scale, the BFI, and the NPI makes findings in this study directly comparable to many existing studies. However, internal consistency estimates of the subtests of the DANVA2 in this study were much lower than is typically found in other studies that have utilized it as a measure of emotion recognition skill. Thus, this represents a potential threat to the external, and internal, validity of the present study. Since it is not standard procedure to ask participants to provide confidence ratings for their answers while being administered the DANVA2, it is possible that this adjustment

to protocol, as well as the shortened exposure time for facial expression stimuli, contributed to the lower internal consistency of the DANVA2. However, as Hall (2001) noted, although the reliability of a measure is typically very much tied to its validity, the most widely used measures of nonverbal skill, such as the Profile of Nonverbal Sensitivity (PONS; Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979), demonstrate predictive validity even though they have internal consistency estimates similar to the ones found for the DANVA2 in the present study.

This study, like others with a similar focus (e.g., Dunning et al., 2003), also measured awareness of emotion recognition in terms of both absolute (i.e., raw score) and comparative (i.e., peer-based) estimates. Although other researchers have tended to find similar patterns of results for both types of estimation (e.g., Dunning et al., 2003), this was not the case in the present investigation. Specifically, findings suggested that overall, how people compare their emotion recognition skill to peers may be more important for social adjustment than how people think about their skill in isolation, or in absolute terms. When one considers the fact that social adjustment, and the recognition of emotional expressions, involves *interaction with others*, this makes sense. However, it is also important to note that self-assessment measures of emotion recognition skill employed in this study were also somewhat different than those used in other studies (e.g., Brackett et al., 2006; Kruger & Dunning, 1999). Specifically, in order to not give away too much information about the items of the DANVA2, participants in this study were asked to estimate raw scores in the form of equivalent percentages, whereas other studies interested in self-assessed skill typically ask participants to simply give a raw score estimate. In addition, in the present study, participants were asked to provide

comparative estimates in the form of a small grouping of ranked categories, rather than in terms of percentile ranks that range between 0 and 100 as is usually done (Dunning, Heath, & Suls, 2004). Although the comparative estimation methods used in this study have the advantage of possibly being easier and more meaningful for participants, the limited number of categories may have caused a restriction of range, which can reduce the size of correlation coefficients (Lockhart, 1997). Further, participants were not told that categories were tied to specific percentile groups; thus, it is unclear how participants were thinking about these categories (e.g., as lining up with a typical normal distribution; etc.).

Regarding measurement of social adjustment, a possible strength of this study was the use of multiple indices of this broad construct, as well as a lack of reliance on self-report measures alone. In addition, the measure of likability used was an improvement over typical measures of likability because it included multiple items, rather than a single item, and thus was in a better position to provide a more valid estimate of the construct. It should be noted that the association between the RLS and the other two measures of social adjustment was low and probably due to the fact that the RLS is based on observation of a recent interaction, whereas the other measures are self-reports.

An additional possible strength of this study was the multimodal nature of the assessment of emotion recognition skill. Indeed, even Brackett et al. (2006) encouraged future researchers to examine separately the components of emotional intelligence (which includes emotion recognition skill) since individual abilities have the potential to explain unique variance in social adjustment and related constructs. To date, most research that bears implications for the relation between emotion recognition skill and social

adjustment has focused exclusively on facial expressions. Although the findings in this study indicated that awareness of facial expression recognition skill was more important for social adjustment than awareness of vocal expression recognition skill, additional research on the roles of various nonverbal channels in social adjustment seems warranted. For example, if researchers were interested in predicting the success of long-distance relationships that involved interactions that took place mostly over the telephone, awareness of one's vocal expression recognition skill may be particularly important.

It is also important to note that although the DANVA2 has been widely used in research on emotion recognition skill, it was designed to be a relatively easy test in order to identify those individuals who would have difficulty processing emotional information that most others would not have. Therefore, despite efforts to make the DANVA2-F a bit more difficult by decreasing the exposure time for facial expression stimuli, even the lowest performers did relatively well overall. Future research focused on investigating the Dunning-Kruger effect as it relates to emotion recognition skill should employ more difficult measures of this construct in order to obtain a wider range of scores. For example, measures that also include neutral expressions (e.g., Tottenham et al., 2009), which are often mistaken for emotional expressions, may be more difficult.

Future Directions

Although this study represents an initial attempt to advance our understanding of the link between emotion recognition skill and social adjustment by focusing on the perception of, and thinking about, emotional cues, there are additional stages in Crick and Dodge's (1994) model of social information processing that need to be examined. For example, does a tendency to over- or underestimate one's awareness of emotion

recognition skill impact subsequent behavioral enactments differentially? And what role might emotion regulation play on the path from the encoding and interpretation of cues to behavior and social evaluation?

Future research should also focus on obtaining larger samples of men, and on elucidating why some aspects of emotion recognition skill in particular, and emotional intelligence more broadly, may be more important for men than women. For years, researchers have emphasized the fact that women are better than men on almost every aspect of emotional processing and emotional outcomes (e.g., Hall 1978, 1984). However, there has been less emphasis and research on identifying why the differences between the genders have developed (for an exception see McClure, 2000), or how to identify the unique ways that men may approach and deal with emotional information. If, as is the case in the present study, men's lack of awareness of their true nonverbal decoding abilities relative to their peers is associated with poorer social outcomes, that finding needs to be replicated and if found again, brought into the awareness of scientific and lay communities.

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Table 1
Descriptive Statistics for Demographic Variables

Variable	*M*	*SD*	%	*Range*
Gender				
Female	--	--	68	--
Male	--	--	32	--
Age (in years)	19.22	1.08	--	17 – 22
Year in College				
Freshman	--	--	39	--
Sophomore	--	--	31	--
Junior	--	--	21	--
Senior	--	--	9	--
College Major				
Psychology[a]	--	--	41	--
Other[b]	--	--	39	--
Undecided/Undeclared	--	--	20	--
Racial/Ethnic Identity				
Asian	--	--	26	--
Black/African American	--	--	8	--
Hispanic/Latino	--	--	2	--
White/Caucasian	--	--	51	--
Multiracial/Multiethnic[c]	--	--	8	--
Other	--	--	5	--
Recruitment Source				
Introductory Psychology	--	--	86	--
Child Development	--	--	14	--

Note. $N = 158$; [a] Indicated majoring in psychology only, or majoring in psychology and another field; [b] Indicated majoring in one or more fields that were not psychology; [c]Circled more than one racial/ethnic category.

Table 2
Correlations among Social Adjustment Measures

	UCLA	SCS	RLS
UCLA Loneliness Total Score	---		
SCS Total Score	-.85**	---	
RLS Summary Score	-.05	.03	---

Note. SCS = Social Connectedness Scale; RLS = Reysen Likability Scale; $n = 93 – 102$; **$p < .01$.

Table 3
Discrepancy Variable Names and Descriptions

Variable Name	Description
Pre-D Abs F	Discrepancy between actual DANVA2-F absolute (raw) score and estimated DANVA2-F absolute score made *before* the DANVA2 was administered (Potential range = 0 – 24)
Pre-D Comp F	Discrepancy between actual comparative status based on DANVA2-F performance relative to peers (i.e., bottom 20% = extremely below average [group 1]; next 20% = below average [group 2]; middle 20% = average [group 3]; next 20% = above average [group 4]; top 20% = extremely above average [group 5]) and estimated DANVA2-F comparative status made *before* the DANVA2 was administered (Potential range = 0 – 4)
Pre-D Abs V	Discrepancy between actual DANVA2-V absolute (raw) score and estimated DANVA2-V absolute score made *before* the DANVA2 was administered (Potential range = 0 – 24)
Pre-D Comp V	Discrepancy between actual comparative status based on DANVA2-V performance relative to peers (i.e., bottom 20% = extremely below average [group 1]; next 20% = below average [group 2]; middle 20% = average [group 3]; next 20% = above average [group 4]; top 20% = extremely above average [group 5]) and estimated DANVA2-V comparative status made *before* the DANVA2 was administered (Potential range = 0 – 4)
Post-D Abs F	Discrepancy between actual DANVA2-F absolute (raw) score and estimated DANVA2-F absolute score made *after* the DANVA2 was administered (Potential range = 0 – 24)
Post-D Comp F	Discrepancy between actual comparative status based on DANVA2-F performance relative to peers (i.e., bottom 20% = extremely below average [group 1]; next 20% = below average [group 2]; middle 20% = average [group 3]; next 20% = above average [group 4]; top 20% = extremely above average [group 5]) and estimated DANVA2-F comparative status made *after* the DANVA2 was administered (Potential range = 0 – 4)
Post-D Abs V	Discrepancy between actual DANVA2-V absolute (raw) score and estimated DANVA2-V absolute score made *after* the DANVA2 was administered (Potential range = 0 – 24)
Post-D Comp V	Discrepancy between actual comparative status based on DANVA2-V performance relative to peers (i.e., bottom 20% = extremely below average [group 1]; next 20% = below average [group 2]; middle 20% = average [group 3]; next 20% = above average [group 4]; top 20% = extremely above average [group 5]) and estimated DANVA2-V comparative status made *after* the DANVA2 was administered (Potential range = 0 – 4)

Note. DANVA2-F = DANVA2 Faces Subtest; DANVA2-V = DANVA2 Voices Subtest.

Table 4
Descriptive Statistics for Emotion Recognition Performance as Measured by the DANVA2

Variable	Total Sample *M* (*SD*)	*Range*
DANVA2-F Total	19.96 (1.91)	15 – 24
DANVA2-V Total	18.08 (2.03)	14 – 23

Note. DANVA2-F = DANVA2 Facial Expression Subtest; DANVA2-V = DANVA2 Vocal Expression Subtest; *n* = 156 for Faces; *n* = 158 for Voices.

Table 5
Descriptive Statistics for Absolute Emotion Recognition Skill Estimates

Variable	*M* (*SD*)	*Range*
Pre-DANVA2 Administration		
DANVA2-F Estimate	18.85 (3.34)	10 – 24
DANVA2-V Estimate	17.94 (3.47)	6 – 24
Post-DANVA2 Administration		
DANVA2-F Estimate	16.87 (3.65)	6 – 23
DANVA2-V Estimate	16.11 (3.88)	4 – 23

Note. DANVA2-F = DANVA2 Facial Expressions Subtest; DANVA2-V = DANVA2 Vocal Expressions Subtest; n = 157 – 158.

Table 6
Descriptive Statistics for Comparative Emotion Recognition Skill Estimates

Variable	EBA	BA	A	AA	EAA	Mdn
Pre-DANVA2 Administration						
DANVA2-F Estimate	0%	0.6%	46.8%	46.2%	6.3%	AA
DANVA2-V Estimate	0%	3.2%	52.5%	39.2%	5.1%	A
Post-DANVA2 Administration						
DANVA2-F Estimate	0%	8.2%	60.8%	29.7%	1.3%	A
DANVA2-V Estimate	0%	14.6%	59.5%	24.7%	1.3%	A

Note. n = 158 for all variables; DANVA2-F = DANVA2 Facial Expressions Subtest; DANVA2-V = DANVA2 Vocal Expressions Subtest; EBA = Extremely below average; BA = Below average; A = Average; AA = Above average; EAA = Extremely above average; Mdn = Median.

Table 7
Descriptive Statistics for Social Adjustment Measures

Variable	*M* (*SD*)
UCLA Loneliness Scale	38.24 (9.00)
Social Connectedness Scale	71.78 (12.77)
Reysen Likability Scale	51.92 (5.43)

Note. $n = 156$ for UCLA Loneliness Scale; $n = 153$ for Social Connectedness Scale; $n = 141$for Reysen Likability Scale.

Table 8
Descriptive Statistics for Personality Variables

Variable	Female *M* (*SD*)	Male *M* (*SD*)	*t* (df)
BFI Openness	3.60 (.61)	3.66 (.68)	-.52 (155)
BFI Conscientiousness	3.62 (.65)	3.36 (.68)	2.34 (155)*
BFI Extraversion	3.39 (.76)	3.31 (.76)	.64 (155)
BFI Agreeableness	3.95 (.60)	3.74 (.63)	1.96 (155)†
BFI Neuroticism	3.00 (.76)	2.51 (.80)	3.67 (155)**
NPI Narcissism	14.58 (5.89)	16.69 (7.14)	-1.96 (150)†

Note. n = 49 – 50 for males; n = 103 – 107 for females; BFI = Big Five Inventory; NPI = Narcissistic Personality Inventory; For all personality variables, higher scores are equivalent to higher levels of that personality dimension; $^{\dagger}p < .10$; *$p < .05$; **$p < .01$.

Table 9
Correlations Coefficients Showing Relation between Actual and Estimated Absolute DANVA2-F and DANVA2-V Emotion Recognition Performance

Variable	Correlation Coefficient
Actual Performance Correlated with Estimates Made Prior to DANVA2 Administration	
DANVA2-F	.17*
DANVA2-V	.16*
Actual Performance Correlated with Estimates Made After DANVA2 Administration	
DANVA2-F	.16*
DANVA2-V	.17*

Note. Measure of correlation = Pearson correlation coefficient; DANVA2-F = DANVA2 Facial Expressions Subtest; DANVA2-V = DANVA2 Vocal Expressions Subtest; For DANVA2-F correlations, $n = 154 – 157$; For DANVA2-V correlations, $n = 158$; $^{\dagger}p < .10$; * $p < .05$; ** $p < .01$.

Table 10
Correlation Coefficients Showing Relation between Actual and Estimated Comparative DANVA2-F and DANVA2-V Emotion Recognition Performance

Variable	Correlation Coefficient
Actual Performance Correlated with Estimates Made Prior to DANVA2 Administration	
DANVA2-F	.09†
DANAV2-V	.19**
Actual Performance Correlated with Estimates Made After DANVA2 Administration	
DANVA2-F	- .01
DANVA2-V	.10†

Note. Measure of correlation = Kendall's Tau-b coefficient; DANVA2-F = DANVA2 Facial Expressions Subtest; DANVA2-V = DANVA2 Vocal Expressions Subtest; For DANVA2-F coefficients, $n = 156$; For DANVA2-V coefficients, $n = 158$; †$p < .10$; *$p < .05$; **$p < .01$.

Table 11
Repeated Measures Multivariate Analyses of Variance (MANOVA) Testing the Dunning-Kruger Effect for Emotion Recognition Skill

Effect	df	df(error)	*F*
Facial Expressions/Absolute Estimates			
Type of ER Meas	2	302	43.20**
Type of ER Meas x Perf Tertile	4	302	6.60**
Vocal Expressions/Absolute Estimates			
Type of ER Meas	2	310	31.77**
Type of ER Meas x Perf Tertile	4	310	9.72**
Facial Expressions/ Comparative Estimates			
Type of ER Meas	2	306	0.04
Type of ER Meas x Perf Tertile	4	306	27.99**
Vocal Expressions/ Comparative Estimates			
Type of ER Meas[a]	1.87	310	1.44
Type of ER Meas x Perf Tertile[a]	3.74	310	26.35**

Note. ER = Emotion Recognition; Meas = Measure; Perf = Performance; Type of ER Meas = Actual DANVA2 score vs. Pre-DANVA2 estimate vs. Post-DANVA2 estimate; Perf Tertile = Lowest 1/3 vs. Middle 1/3 vs. Highest 1/3 based on DANVA2 Performance; [a] *F*s based on Greenhouse-Geisser due to violation of sphericity assumption; $^{\dagger}p < .10$; * $p < .05$; ** $p < .01$.

Table 12
Simple Effects Tests of Dunning-Kruger Effect: Comparing Actual DANVA2-F Performance to Absolute DANVA2-F Estimates

Variable	*n*	*M* (*SD*)	*t*	Nature of Estimate
		Before DANVA2 Administration		
Lower Third Performance Group				
Actual DANVA2 Performance	59	17.97 (1.14)	0.27	No diff.
Pre-DANVA2 Estimate	--	18.08 (3.47)	--	
Middle Third Performance Group				
Actual DANVA2 Performance	32	20.00 (0.00)	-1.58	No diff.
Pre-DANVA2 Estimate	--	19.19 (2.90)	--	
Upper Third Performance Group				
Actual DANVA2 Performance	64	21.75 (0.89)	-5.24**	Under
Pre-DANVA2 Estimate	--	19.44 (3.26)	--	
		After DANVA2 Administration		
Lower Third Performance Group				
Actual DANVA2 Performance	58	17.95 (1.15)	-4.30**	Under
Post-DANVA2 Estimate	--	15.91 (3.64)	--	
Middle Third Performance Group				
Actual DANVA2 Performance	32	20.00 (0.00)	-2.83**	Under
Post-DANVA2 Estimate	--	18.34 (3.31)	--	
Upper Third Performance Group				
Actual DANVA2 Performance	65	21.74 (0.89)	-10.59**	Under
Post-DANVA2 Estimate	--	17.09 (3.32)	--	

Note. No diff. = No difference; Over = Overestimate; Under = Underestimate; $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 13
Simple Effects Tests of Dunning-Kruger Effect: Comparing Actual DANVA2-V Performance to Absolute DANVA2-V Estimates

Variable	*n*	*M* (*SD*)	*t*	Nature of Estimate
Before DANVA2 Administration				
Lower Third Performance Group				
Actual DANVA2 Performance	64	16.05 (1.08)	4.45**	Over
Pre-DANVA2 Estimate	--	17.83 (3.29)	--	
Middle Third Performance Group				
Actual DANVA2 Performance	52	18.56 (0.50)	- 2.16*	Under
Pre-DANVA2 Estimate	--	17.42 (3.82)	--	
Upper Third Performance Group				
Actual DANVA2 Performance	42	20.60 (0.73)	- 3.78**	Under
Pre-DANVA2 Estimate	--	18.76 (3.21)	--	
After DANVA2 Administration				
Lower Third Performance Group				
Actual DANVA2 Performance	64	16.05 (1.08)	- 0.83	No diff.
Post-DANVA2 Estimate	--	15.70 (3.53)	--	
Middle Third Performance Group				
Actual DANVA2 Performance	52	18.56 (0.50)	- 4.27**	Under
Post-DANVA2 Estimate	--	16.25 (3.97)	--	
Upper Third Performance Group				
Actual DANVA2 Performance	42	20.60 (0.73)	- 6.01**	Under
Post-DANVA2 Estimate	--	16.57 (4.29)	--	

Note. No diff. = No difference; Over = Overestimate; Under = Underestimate; $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 14
Simple Effects Tests of Dunning-Kruger Effect: Comparing Standardized Actual DANVA2-F Performance to Standardized Comparative DANVA2-F Estimates

Variable	*n*	*M* (*SD*)	*t*	Nature of Estimate
Before DANVA2 Administration				
Lower Third Performance Group				
Stand. Actual DANVA2 Performance	59	-1.04 (0.60)	6.63**	Over
Stand. Pre-DANVA2 Comparative Estimate	--	-0.19 (0.92)	--	
Middle Third Performance Group				
Stand. Actual DANVA2 Performance	32	0.02 (0.00)	-0.60	No diff.
Stand. Pre-DANVA2 Comparative Estimate	--	-0.08 (1.00)	--	
Upper Third Performance Group				
Stand. Actual DANVA2 Performance	65	0.93 (0.46)	-5.78**	Under
Stand. Pre-DANVA2 Comparative Estimate	--	0.13 (1.04)	--	
After DANVA2 Administration				
Lower Third Performance Group				
Stand. Actual DANVA2 Performance	59	-1.04 (0.60)	6.79**	Over
Stand. Post-DANVA2 Comparative Estimate	--	-0.03 (0.91)	--	
Middle Third Performance Group				
Stand. Actual DANVA2 Performance	32	0.02 (0.00)	-0.05	No diff.
Stand. Post-DANVA2 Comparative Estimate	--	0.02 (0.93)	--	
Upper Third Performance Group				
Stand. Actual DANVA2 Performance	65	0.93 (0.46)	-5.89**	Under
Stand. Post-DANVA2 Comparative Estimate	--	0.01 (1.12)	--	

Note. Stand. = Standardized; No diff. = No difference; Over = Overestimate; Under = Underestimate; $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 15
Simple Effects Tests of Dunning-Kruger Effect: Comparing Standardized Actual DANVA2-V Performance to Standardized Comparative DANVA2-V Estimates

Variable	*n*	*M* (*SD*)	*t*	Nature of Estimate
Before DANVA2 Administration				
Lower Third Performance Group				
Stand. Actual DANVA2 Performance	59	-0.18 (0.94)	-0.05	No diff.
Stand. Pre-DANVA2 Comparative Estimate	--	-0.19 (1.02)	--	
Middle Third Performance Group				
Stand. Actual DANVA2 Performance	32	0.01 (1.19)	-1.02	No diff.
Stand. Pre-DANVA2 Comparative Estimate	--	-0.23 (0.83)	--	
Upper Third Performance Group				
Stand. Actual DANVA2 Performance	65	0.17 (0.95)	0.62	No diff.
Stand. Pre-DANVA2 Comparative Estimate	--	0.26 (0.97)	--	
After DANVA2 Administration				
Lower Third Performance Group				
Stand. Actual DANVA2 Performance	59	-0.18 (0.94)	2.71**	Over
Stand. Post-DANVA2 Comparative Estimate	--	0.27 (0.99)	--	
Middle Third Performance Group				
Stand. Actual DANVA2 Performance	32	0.01 (1.19)	-0.24	No diff.
Stand. Post-DANVA2 Comparative Estimate	--	-0.05 (0.98)	--	
Upper Third Performance Group				
Stand. Actual DANVA2 Performance	65	0.17 (0.95)	-2.49*	Under
Stand. Post-DANVA2 Comparative Estimate	--	-0.22 (0.99)	--	

Note. Stand. = Standardized; No diff. = No difference; Over = Overestimate; Under = Underestimate; $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 16

Pearson Correlation and Kendall's Tau-b Coefficients Reflecting Relations between Narcissism, Neuroticism, and Measures of Emotion Recognition Skill

Personality Variable	Emotion Recognition Skill Variables									
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Narcissism	.05	-.02	.08	.13†	.30**	.24**	.08	.09	.24**	.14**
Neuroticism	.11	-.00	-.09	-.07	-.06	-.09	-.02	-.13†	-.08	-.26**

Note. (1) = DANVA2 Faces total score; (2) = DANVA2 Voices total score; (3) = Pre-DANVA2 Faces Absolute Estimate; (4) = Pre-DANVA2 Voices Absolute Estimate; (5) = Pre-DANVA2 Faces Comparative Estimate; (6) = Pre-DANVA2 Voices Comparative Estimate; (7) = Post-DANVA2 Faces Absolute Estimate; (8) = Post-DANVA2 Voices Absolute Estimate; (9) = Post-DANVA2 Faces Comparative Estimate; (10) = Post-DANVA2 Voices Comparative Estimate; Narcissism = NPI (Narcissistic Personality Inventory) total score; Neuroticism = BFI (Big Five Inventory) Neuroticism total score; $^{**}p < .01$; $^{*}p < .05$; $^{\dagger}p < .10$.

Table 17
Correlation Coefficients for DANVA2 Performance and Social Adjustment Measures

	(1)	(2)	(3)	(4)	(5)
(1) DANVA2-F	---	.23†	.17	-.11	.23†
(2) DANVA2-V	.08	---	-.23†	.20†	.17
(3) UCLA	-.17*	.01	---	-.88**	-.01
(4) SCS	.13	.05	-.85**	---	.00
(5) RLS	-.01	.03	-.05	.03	---

Note. Female correlations below diagonal (n = 93 – 106); Male correlations above diagonal (n = 43 – 50); (1) DANVA2-F = DANVA2 Faces Total Score; (2) DANVA2-V = DANVA2 Voices Total Score; (3) UCLA = UCLA Loneliness Total Score; (4) SCS = Social Connectedness Scale Total Score; (5) RLS = Reysen Likability Scale Summary Score; †$p < 10$; *$p < .05$; **$p < .01$.

Table 18
Correlation Coefficients for Personality and Social Adjustment Measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) BFI-O	---	.03	.25*	.03	.10	.17	-.15	.19	.25*
(2) BFI-C	-.03	---	.51**	.44**	-.20†	-.40**	.39**	.14	.37**
(3) BFI-E	.32**	.11	---	.20†	.03	-.43**	.52**	.07	.55**
(4) BFI-A	.09	.40**	.07	---	-.28*	-.57**	.47**	.01	-.21†
(5) BFI-N	.03	-.42**	-.23*	-.30**	---	.42**	-.42**	-.04	-.07
(6) UCLA	-.08	-.41**	-.41**	-.28**	.34**	---	-.88**	-.01	-.20†
(7) SCS	.05	.33**	.34**	.22*	-.27**	-.85**	---	.00	.29*
(8) RLS	.05	.02	.14	-.04	.02	-.05	.03	---	.06
(9) NPI	.40**	.18*	.55**	-.06	-.24**	-.28**	.24**	.21*	---

Note. Female correlations below diagonal (n = 93 – 107); Male correlations above diagonal (n = 43 – 50); (1) BFI-O = Big Five Inventory Openness; (2) BFI-C = BFI Conscientiousness; (3) BFI-E = BFI Extraversion; (4) BFI-A = Agreeableness; (5) BFI-N = BFI Neuroticism; (6) UCLA = UCLA Loneliness Scale Total Score; (7) SCS = Social Connectedness Scale Total Score; (8) RLS = Reysen Likability Scale Summary Score; (9) NPI = Narcissistic Personality Inventory Total Score; †$p < .10$; *$p < .05$; **$p < .01$.

Table 19
Correlation Coefficients for DANVA2 Performance and Personality Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) BFI–O	---	.03	.25†	.03	.10	.25†	.15	.27†
(2) BFI–C	-.03	---	.51**	.44**	-.20	.37**	-.08	.18
(3) BFI–E	.32**	.11	---	.20	.03	.55**	.07	.09
(4) BFI–A	.09	.40**	.07	---	-.28*	-.21	-.16	.24
(5) BFI–N	.03	-.42**	-.23*	-.30**	---	-.07	.06	-.09
(6) NPI	.40**	.18*	.55**	-.06	-.24*	---	.12	.20
(7) DANVA2-F	-.05	.09	-.00	-.22*	.06	.04	---	.23
(8) DANVA2-V	-.20*	-.05	-.01	-.03	.07	-.18†	.08	---

Note. Female correlations below diagonal (n = 101 – 107); Male correlations above diagonal (n = 49 – 50); (1) BFI–O = Big Five Inventory Openness; (2) BFI–C = Big Five Inventory Conscientiousness; (3) BFI–E = Big Five Inventory Extraversion; (4) BFI–A = Big Five Inventory Agreeableness; (5) BFI–N = Big Five Inventory Neuroticism; (6) NPI = Narcissistic Personality Inventory Total Score; (7) DANVA2-F = DANVA2 Faces Subtest Performance; (8) DANVA2-V = DANVA2 Voices Subtest Performance; $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 20
Magnitude-Only (i.e., Absolute Value of the Difference between Actual and Estimated Performance) Discrepancy Score Descriptive Statistics

Variable	*Mean* (*SD*)	Range	Median	Mode
Pre-D Abs F	2.86 (2.32)	0 – 12	2	1
Pre-D Comp F	1.26 (0.93)	0 – 3	1	1
Pre-D Abs V	3.06 (2.13)	0 – 12	3	1
Pre-D Comp V	1.28 (0.90)	0 – 3	1	1
Post-D Abs F	3.76 (3.03)	0 – 14	3	2
Post-D Comp F	1.28 (0.89)	0 – 3	1	1
Post-D Abs V	3.41 (2.95)	0 – 17	3	1
Post-D Comp V	1.34 (0.84)	0 – 3	1	2

Note. Pre-D Abs F = Discrepancy between actual DANVA2-F absolute (raw) score and estimated DANVA2-F absolute score made *before* the DANVA2 was administered; Pre-D Comp F = Discrepancy between actual comparative status based on DANVA2-F performance relative to peers and estimated DANVA2-F comparative status made *before* the DANVA2 was administered; Pre-D Abs V = Discrepancy between actual DANVA2-V absolute (raw) score and estimated DANVA2-V absolute score made *before* the DANVA2 was administered; Pre-D Comp V = Discrepancy between actual comparative status based on DANVA2-V performance relative to peers and estimated DANVA2-V comparative status made *before* the DANVA2 was administered; Post-D Abs F = Discrepancy between actual DANVA2-F absolute (raw) score and estimated DANVA2-F absolute score made *after* the DANVA2 was administered; Post-D Comp F = Discrepancy between actual comparative status based on DANVA2-F performance relative to peers and estimated DANVA2-F comparative status made *after* the DANVA2 was administered; Post-D Abs V = Discrepancy between actual DANVA2-V absolute (raw) score and estimated DANVA2-V absolute score made *after* the DANVA2 was administered; Post-D Comp V = Discrepancy between actual comparative status based on DANVA2-V performance relative to peers and estimated DANVA2-V comparative status made *after* the DANVA2 was administered; n = 155 – 158.

Table 21
Direction-Only (i.e., Underestimate, No Discrepancy, or Overestimate) Discrepancy Score Descriptive Statistics

Variable	%Underestimate	%No Discrepancy	%Overestimate
Pre-D Abs F	49.0	11.0	40.0
Pre-D Comp F	49.4	22.4	28.2
Pre-D Abs V	46.2	7.6	46.2
Pre-D Comp V	44.9	20.9	34.2
Post-D Abs F	76.1	8.4	15.5
Post-D Comp F	44.2	20.5	35.3
Post-D Abs V	59.5	8.2	32.3
Post-D Comp V	40.5	18.4	41.1

Note. Pre-D Abs F = Discrepancy between actual DANVA2-F absolute (raw) score and estimated DANVA2-F absolute score made *before* the DANVA2 was administered; Pre-D Comp F = Discrepancy between actual comparative status based on DANVA2-F performance relative to peers and estimated DANVA2-F comparative status made *before* the DANVA2 was administered; Pre-D Abs V = Discrepancy between actual DANVA2-V absolute (raw) score and estimated DANVA2-V absolute score made *before* the DANVA2 was administered; Pre-D Comp V = Discrepancy between actual comparative status based on DANVA2-V performance relative to peers and estimated DANVA2-V comparative status made *before* the DANVA2 was administered; Post-D Abs F = Discrepancy between actual DANVA2-F absolute (raw) score and estimated DANVA2-F absolute score made *after* the DANVA2 was administered; Post-D Comp F = Discrepancy between actual comparative status based on DANVA2-F performance relative to peers and estimated DANVA2-F comparative status made *after* the DANVA2 was administered; Post-D Abs V = Discrepancy between actual DANVA2-V absolute (raw) score and estimated DANVA2-V absolute score made *after* the DANVA2 was administered; Post-D Comp V = Discrepancy between actual comparative status based on DANVA2-V performance relative to peers and estimated DANVA2-V comparative status made *after* the DANVA2 was administered; n = 155 – 158.

Table 22
Correlation Coefficients for Magnitude-Only Discrepancy Scores and Social Adjustment Measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Pre-D Abs F	---	.23†	.19†	.07	.52**	.08	.22†	-.02	.20†	-.25*	-.25†
(2) Pre-D Comp F	.13	---	-.03	.05	-.03	.67**	-.23†	-.06	.14	-.23†	-.14
(3) Pre-D Abs V	.20*	.11	---	.12	.16	-.11	-.08	.15	-.20†	.18	.08
(4) Pre-D Comp V	.07	.11	.04	---	.08	-.05	-.10	.56**	-.05	-.01	-.06
(5) Post-D Abs F	.29**	.14	.04	-.12	---	.07	.39**	.02	.20†	-.21†	.12
(6) Post-D Comp F	.06	.62**	.11	.10	.32**	---	-.22†	-.03	.32*	-.38**	-.20†
(7) Post-D Abs V	.18*	.11	.22*	-.09	.51**	.08	---	-.17	.05	.08	.08
(8) Post-D Comp V	.06	.15†	-.05	.54**	-.06	.16*	.23*	---	-.02	.01	.01
(9) UCLA	.08	.11	-.13	.00	-.03	.14†	-.06	.03	---	-.88**	-.01
(10) SCS	-.18*	-.12	.01	-.09	-.08	-.15†	-.09	-.13	-.85**	---	.00
(11) RLS	.16†	.04	.13	.06	-.02	.01	-.13	-.04	-.05	.03	---

Note. Female correlations below diagonal (n = 94 – 108); Male correlations above diagonal (n = 44 – 50); (1) – (8) = See Table 3 for detailed descriptions of these variables; (9) UCLA = UCLA Loneliness Total Score; (10) SCS = Social Connectedness Scale Total Score; (11) RLS = Reysen Likability Scale Summary Score; $^{\dagger}p < .10$; *$p < .05$; **$p < .01$.

Table 23
Correlation Coefficients for Magnitude-Only Discrepancy Scores and Personality Variables

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
(1) Pre-D Abs F	---	.23	.19	.07	.52**	.08	.22	-.02	-.08	-.17	-.03	-.33*	.05	.05
(2) Pre-D Comp F	.13	---	-.03	.05	-.03	.67**	-.23	-.06	-.11	.09	-.02	-.06	.16	.09
(3) Pre-D Abs V	.20*	.11	---	.12	.16	-.11	-.08	.15	.21	.03	.19	-.09	-.28*	.25†
(4) Pre-D Comp V	.07	.11	.04	---	.08	-.05	-.10	.56**	-.10	.06	.04	-.12	-.19	.04
(5) Post-D Abs F	.29**	.14	.04	-.12	---	.07	.39**	.02	.00	-.08	.10	-.24†	.03	.02
(6) Post-D Comp F	.06	.62**	.07	.10	.32**	---	-.22	-.03	.14	-.25†	-.23	-.02	.21	-.11
(7) Post-D Abs V	.18†	.11	.22*	-.09	.51**	.08	---	-.17	.01	-.00	.19	-.18	-.02	.14
(8) Post-D Comp V	.06	.15	-.05	.54**	-.06	.16	.23*	---	.04	.03	.11	.08	-.10	.02
(9) BFI–O	-.18†	.02	-.10	.23*	-.30**	.00	-.35**	.01	---	.03	.25†	.03	.10	.25†
(10) BFI–C	-.09	-.15	.01	-.00	-.03	-.13	.04	.04	-.03	---	.51**	.44**	-.20	.37**
(11) BFI–E	-.15	.01	-.03	-.07	-.17†	-.02	-.14	-.12	.32**	.11	---	.20	.03	.55**
(12) BFI–A	-.14	-.02	-.06	-.11	-.11	-.16	-.11	-.08	.09	.40**	.07	---	-.28*	-.21
(13) BFI–N	.07	-.11	-.17†	-.16	.09	.01	.03	-.10	.03	-.42**	-.23*	-.30**	---	-.07
(14) NPI	-.10	.14	-.10	.06	-.17†	.16	-.21*	.10	.40**	.18†	.55**	-.06	-.24*	---

Note. Female correlations below diagonal (n = 100 – 108); Male correlations above diagonal (n = 49 – 50); (1) – (8) = See Table 3 for detailed descriptions of these variables; (9) BFI–O = Big Five Inventory Openness; (10) BFI–C = Big Five Inventory Conscientiousness; (11) BFI–E = Big Five Inventory Extraversion; (12) BFI–A = Big Five Inventory Agreeableness; (13) BFI–N = Big Five Inventory Neuroticism; (14) NPI = Narcissistic Personality Inventory Total Score $^{\dagger}p < .10$; *$p < .05$; **$p < .01$.

Table 24
Hierarchical Regression Analysis with Personality, DANVA2-F, and Pre-D Abs F as Predictors of Loneliness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 98)						
Step 1					--	.30**
	Conscientiousness	-3.66	1.35	-.28**		
	Extraversion	-3.76	1.16	-.34**		
	Agreeableness	-1.62	1.38	-.11		
	Neuroticism	1.13	1.12	.10		
	Narcissism	-.02	.15	-.02		
Step 2					.04	.34*
	DANVA2-F	-.97	.46	-.19*		
Step 3					.00	.34
	Pre-D Abs F	.13	.34	.03		
Males (n = 49)						
Step 1					--	.53**
	Conscientiousness	1.44	2.04	.10		
	Extraversion	-4.16	1.88	-.32*		
	Agreeableness	-7.60	2.18	-.48**		
	Neuroticism	3.78	1.39	.31**		
	Narcissism	-.20	.21	-.14		
Step 2					.01	.54
	DANVA2-F	.45	.48	.10		
Step 3					.00	.54
	Pre-D Abs F	.13	.46	.03		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 25
Hierarchical Regression Analysis with Personality, DANVA2-F, and Pre-D Abs F as Predictors of Social Connectedness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 96)						
Step 1					--	.19**
	Conscientiousness	3.65	2.11	.19†		
	Extraversion	4.60	1.88	.28*		
	Agreeableness	1.85	2.16	.09		
	Neuroticism	-1.27	1.76	-.08		
	Narcissism	.06	.25	.03		
Step 2					.02	.21
	DANVA2-F	1.09	.74	.15		
Step 3					.02	.23
	Pre-D Abs F	-.82	.53	-.15		
Males (n = 49)						
Step 1					--	.54**
	Conscientiousness	-2.14	2.74	-.11		
	Extraversion	7.68	2.52	.44**		
	Agreeableness	7.67	2.92	.36*		
	Neuroticism	-5.63	1.86	-.34**		
	Narcissism	.27	.28	.14		
Step 2					.01	.55
	DANVA2-F	-.54	.65	-.09		
Step 3					.01	.56
	Pre-D Abs F	-.77	.60	-.14		

Note. †$p < .10$; *$p < .05$; **$p < .01$.

Table 26
Hierarchical Regression Analysis with Personality, DANVA2-F, and Pre-D Abs F as Predictors of Likability

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 90)						
Step 1					--	.04†
	Narcissism	.18	.09	.20†		
Step 2					.00	.04
	DANVA2-F	.22	.35	.07		
Step 3					.02	.06
	Pre-D Abs F	.33	.26	.14		
Males (n = 43)						
Step 1					--	.05
	DANVA2-F	.47	.31	.23		
Step 2					.08	.13†
	Pre-D Abs F	-.53	.27	-.29†		

Note. †$p < .10$; *$p < .05$; **$p < .01$.

Table 27
Hierarchical Regression Analysis with Personality, DANVA2-F, and Pre-D Comp F as Predictors of Loneliness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 99)						
Step 1					--	.31**
	Conscientiousness	-3.69	1.32	-.28**		
	Extraversion	-3.74	1.15	-.34**		
	Agreeableness	-1.61	1.37	-.11		
	Neuroticism	1.11	1.10	.10		
	Narcissism	-.02	.15	-.02		
Step 2					.03	.34*
	DANVA2-F	-.97	.45	-.19*		
Step 3					.00	.34
	Pre-D Comp F	.23	.91	.03		
Males (n = 49)						
Step 1					--	.53**
	Conscientiousness	1.44	2.04	.10		
	Extraversion	-4.16	1.88	-.32*		
	Agreeableness	-7.60	2.18	-.48**		
	Neuroticism	3.78	1.39	.31**		
	Narcissism	-.20	.21	-.14		
Step 2					.01	.54
	DANVA2-F	.45	.48	.10		
Step 3					.04	.58†
	Pre-D Comp F	2.99	1.50	.27†		

Note. †$p < .10$; *$p < .05$; **$p < .01$.

Table 28
Hierarchical Regression Analysis with Personality, DANVA2-F, and Pre-D Comp F as Predictors of Social Connectedness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 97)						
Step 1					--	.19**
	Conscientiousness	3.77	2.08	.20†		
	Extraversion	4.50	1.85	.28*		
	Agreeableness	1.78	2.14	.09		
	Neuroticism	-1.16	1.74	-.07		
	Narcissism	.06	.25	.03		
Step 2					.02	.21
	DANVA2-F	1.09	.74	.15		
Step 3					.00	.21
	Pre-D Comp F	-.86	1.44	-.07		
Males (n = 49)						
Step 1					--	.54**
	Conscientiousness	-2.14	2.74	-.11		
	Extraversion	7.68	2.52	.44**		
	Agreeableness	7.67	2.92	.36*		
	Neuroticism	-5.63	1.86	-.34**		
	Narcissism	.27	.28	.14		
Step 2					.01	.55
	DANVA2-F	-.54	.65	-.09		
Step 3					.06	.61*
	Pre-D Comp F	-5.16	1.95	-.34*		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 29
Hierarchical Regression Analysis with Personality, DANVA2-F, and Pre-D Comp F as Predictors of Likability

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 91)						
Step 1					--	.04†
	Narcissism	.19	.09	.21†		
Step 2					.00	.04
	DANVA2-F	.20	.35	.06		
Step 3					.00	.04
	Pre-D Comp F	-.13	.69	-.02		
Males (n = 44)						
Step 1					--	.05
	DANVA2-F	.47	.31	.23		
Step 2					.00	.05
	Pre-D Comp F	-.03	.97	-.01		

Note. †$p < .10$; *$p < .05$; **$p < .01$.

Table 30
Hierarchical Regression Analysis with Personality, DANVA2-V, and Pre-D Abs V as Predictors of Loneliness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 101)						
Step 1					--	.32**
	Conscientiousness	-3.80	1.30	-.29**		
	Extraversion	-3.76	1.13	-.34**		
	Agreeableness	-1.65	1.35	-.12		
	Neuroticism	1.14	1.09	.10		
	Narcissism	-.02	.15	-.02		
Step 2					.00	.32
	DANVA2-V	-.13	.39	-.03		
Step 3					.01	.33
	Pre-D Abs V	-.36	.36	-.09		
Males (n = 49)						
Step 1					--	.53**
	Conscientiousness	1.44	2.04	.10		
	Extraversion	-4.16	1.88	-.32*		
	Agreeableness	-7.60	2.18	-.48**		
	Neuroticism	3.78	1.39	.31**		
	Narcissism	-.20	.21	-.14		
Step 2					.01	.54
	DANVA2-V	-.42	.51	-.09		
Step 3					.00	.54
	Pre-D Abs V	-.38	.64	-.07		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 31
Hierarchical Regression Analysis with Personality, DANVA2-V, and Pre-D Abs V as Predictors of Social Connectedness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 99)						
Step 1					--	.21**
	Conscientiousness	4.04	2.04	.21†		
	Extraversion	4.56	1.83	.28*		
	Agreeableness	1.85	2.12	.09		
	Neuroticism	-1.23	1.72	-.08		
	Narcissism	.06	.24	.03		
Step 2					.01	.22
	DANVA2-V	.56	.62	.09		
Step 3					.00	.22
	Pre-D Abs V	-.16	.58	-.03		
Males (n = 49)						
Step 1					--	.54**
	Conscientiousness	-2.14	2.74	-.11		
	Extraversion	7.68	2.52	.44**		
	Agreeableness	7.67	2.92	.36*		
	Neuroticism	-5.63	1.86	-.34**		
	Narcissism	.27	.28	.14		
Step 2					.00	.54
	DANVA2-V	.17	.69	.03		
Step 3					.00	.54
	Pre-D Abs V	.01	.87	.00		

Note. †$p < .10$; *$p < .05$; **$p < .01$.

Table 32
Hierarchical Regression Analysis with Personality, DANVA2-V, and Pre-D Abs V as Predictors of Likability

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 93)						
Step 1					--	.04*
	Narcissism	.19	.09	.21*		
Step 2					.01	.05
	DANVA2-V	.29	.30	.10		
Step 3					.03	.08†
	Pre-D Abs V	.47	.27	.18†		
Males (n = 44)						
Step 1					--	.03
	DANVA2-V	.34	.31	.17		
Step 2					.01	.04
	Pre-D Abs V	.25	.45	.09		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 33
Hierarchical Regression Analysis with Personality, DANVA2-V, and Pre-D Comp V as Predictors of Loneliness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 101)						
Step 1					--	.32**
	Conscientiousness	-3.80	1.30	-.29**		
	Extraversion	-3.76	1.13	-.34**		
	Agreeableness	-1.65	1.35	-.12		
	Neuroticism	1.14	1.09	.10		
	Narcissism	-.02	.15	-.02		
Step 2					.00	.32
	DANVA2-V	-.13	.39	-.03		
Step 3					.00	.32
	Pre-D Comp V	-.49	.95	-.05		
Males (n = 49)						
Step 1					--	.53**
	Conscientiousness	1.44	2.04	.10		
	Extraversion	-4.16	1.88	-.32*		
	Agreeableness	-7.60	2.18	-.48**		
	Neuroticism	3.78	1.39	.31**		
	Narcissism	-.20	.21	-.14		
Step 2					.01	.54
	DANVA2-V	-.42	.51	-.09		
Step 3					.00	.54
	Pre-D Comp V	-.71	1.39	-.06		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 34
Hierarchical Regression Analysis with Personality, DANVA2-V, and Pre-D Comp V as Predictors of Social Connectedness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 99)						
Step 1					--	.21**
	Conscientiousness	4.04	2.04	.21†		
	Extraversion	4.56	1.83	.28*		
	Agreeableness	1.85	2.12	.09		
	Neuroticism	-1.22	1.72	-.08		
	Narcissism	.06	.24	.03		
Step 2					.01	.22
	DANVA2-V	.56	.62	.09		
Step 3					.00	.22
	Pre-D Comp V	-.53	1.47	-.04		
Males (n = 49)						
Step 1					--	.54**
	Conscientiousness	-2.14	2.74	-.11		
	Extraversion	7.68	2.52	.44**		
	Agreeableness	7.67	2.92	.36*		
	Neuroticism	-5.63	1.86	-.34**		
	Narcissism	.27	.28	.14		
Step 2					.00	.54
	DANVA2-V	.17	.69	.03		
Step 3					.00	.54
	Pre-D Comp V	-.71	1.88	-.05		

Note. †$p < .10$; *$p < .05$; **$p < .01$.

Table 35
Hierarchical Regression Analysis with Personality, DANVA2-V, and Pre-D Comp V as Predictors of Likability

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 93)						
Step1					--	.04*
	Narcissism	.19	.09	.21*		
Step 2					.01	.05
	DANVA2-V	.29	.30	.10		
Step 3					.00	.05
	Pre-D Comp V	.40	.67	.07		
Males (n = 44)						
Step 1					--	.03
	DANVA2-V	.34	.31	.17		
Step 2					.00	.03
	Pre-D Comp V	.09	.92	.02		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 36
Hierarchical Regression Analysis with Personality, DANVA2-F, and Post-D Abs F as Predictors of Loneliness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 98)						
Step1					--	.31**
	Conscientiousness	-3.75	1.33	-.28**		
	Extraversion	-3.83	1.16	-.35**		
	Agreeableness	-1.64	1.37	-.12		
	Neuroticism	1.02	1.12	.09		
	Narcissism	.00	.16	.00		
Step 2					.03	.34*
	DANVA2-F	-.99	.46	-.20*		
Step 3					.00	.34
	Post-D Abs F	-.09	.26	-.03		
Males (n = 49)						
Step1					--	.53**
	Conscientiousness	1.44	2.04	.10		
	Extraversion	-4.16	1.88	-.32*		
	Agreeableness	-7.60	2.18	-.48**		
	Neuroticism	3.78	1.39	.31**		
	Narcissism	-.20	.21	-.14		
Step 2					.01	.54
	DANVA2-F	.45	.48	.10		
Step 3					.01	.55
	Post-D Abs F	.42	.42	.12		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 37
Hierarchical Regression Analysis with Personality, DANVA2-F, and Post-D Abs F as Predictors of Social Connectedness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 96)						
Step1					--	.19**
	Conscientiousness	3.84	2.10	.20†		
	Extraversion	4.59	1.87	.29*		
	Agreeableness	1.81	2.15	.09		
	Neuroticism	-1.07	1.76	-.07		
	Narcissism	.03	.25	.02		
Step 2					.02	.21
	DANVA2-F	1.12	.75	.15		
Step 3					.01	.22
	Post-D Abs F	-.31	.40	-.08		
Males (n = 49)						
Step1					--	.54**
	Conscientiousness	-2.14	2.74	-.11		
	Extraversion	7.68	2.52	.44**		
	Agreeableness	7.67	2.92	.36*		
	Neuroticism	-5.63	1.86	-.34**		
	Narcissism	.27	.28	.14		
Step 2					.01	.55
	DANVA2-F	-.54	.65	-.09		
Step 3					.02	.57
	Post-D Abs F	-.91	.55	-.19		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 38
Hierarchical Regression Analysis with Personality, DANVA2-F, and Post-D Abs F as Predictors of Likability

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 90)						
Step1					--	.05*
	Narcissism	.21	.10	.22*		
Step 2					.00	.05
	DANVA2-F	.17	.35	.05		
Step 3					.00	.05
	Post-D Abs F	-.07	.20	-.04		
Males (n = 44)						
Step1					--	.05
	DANVA2-F	.47	.31	.23		
Step 2					.01	.06
	Post-D Abs F	.13	.27	.07		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 39
Hierarchical Regression Analysis with Personality, DANVA2-F, and Post-D Comp F as Predictors of Loneliness

Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 99)					
Step1				--	.31**
Conscientiousness	-3.69	1.32	-.28**		
Extraversion	-3.74	1.15	-.34**		
Agreeableness	-1.61	1.37	-.11		
Neuroticism	1.11	1.10	.10		
Narcissism	-.02	.15	-.02		
Step 2				.03	.34*
DANVA2-F	-.97	.45	-.19*		
Step 3				.01	.35
Post-D Comp F	.94	.90	.09		
Males (n = 49)					
Step1				--	.53**
Conscientiousness	1.44	2.04	.10		
Extraversion	-4.16	1.88	-.32*		
Agreeableness	-7.60	2.18	-.48**		
Neuroticism	3.78	1.39	.31**		
Narcissism	-.20	.21	-.14		
Step 2				.01	.54
DANVA2-F	.45	.48	.10		
Step 3				.10	.64**
Post-D Comp F	4.28	1.24	.40**		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 40
Hierarchical Regression Analysis with Personality, DANVA2-F, and Post-D Comp F as Predictors of Social Connectedness

Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 97)					
Step1				--	.19**
Conscientiousness	3.77	2.08	.20†		
Extraversion	4.50	1.85	.28*		
Agreeableness	1.78	2.14	.09		
Neuroticism	-1.16	1.74	-.07		
Narcissism	.06	.25	.03		
Step 2				.02	.21
DANVA2-F	1.09	.74	.15		
Step 3				.01	.22
Post-D Comp F	-1.47	1.41	-.10		
Males (n =49)					
Step1				--	.54**
Conscientiousness	-2.14	2.74	-.11		
Extraversion	7.68	2.52	.44**		
Agreeableness	7.67	2.92	.36*		
Neuroticism	-5.63	1.86	-.34**		
Narcissism	.27	.28	.14		
Step 2				.01	.55
DANVA2-F	-.54	.65	-.09		
Step 3				.09	.64**
Post-D Comp F	-5.42	1.69	-.38**		

Note. †$p < .10$; *$p < .05$; **$p < .01$.

Table 41
Hierarchical Regression Analysis with Personality, DANVA2-F, and Post-D Comp F as Predictors of Likability

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 91)						
Step1					--	.04†
	Narcissism	.19	.09	.21†		
Step 2					.00	.04
	DANVA2-F	.20	.35	.06		
Step 3					.00	.04
	Post-D Comp F	-.24	.68	-.04		
Males (n = 44)						
Step1					--	.05
	DANVA2-F	.47	.31	.23		
Step 2					.01	.06
	Post-D Comp F	-.56	.89	-.11		

Note. †$p < .10$; *$p < .05$; **$p < .01$.

Table 42
Hierarchical Regression Analysis with Personality, DANVA2-V, and Post-D Abs V as Predictors of Loneliness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 101)						
Step1					--	.32**
	Conscientiousness	-3.80	1.30	-.29**		
	Extraversion	-3.76	1.13	-.34**		
	Agreeableness	-1.65	1.35	-.12		
	Neuroticism	1.14	1.09	.10		
	Narcissism	-.02	.15	-.02		
Step 2					.00	.32
	DANVA2-V	-.13	.39	-.03		
Step 3					.01	.33
	Post-D Abs V	-.32	.29	-.10		
Males (n = 49)						
Step1					--	.53**
	Conscientiousness	1.44	2.04	.10		
	Extraversion	-4.16	1.89	-.32*		
	Agreeableness	-7.60	2.18	-.48**		
	Neuroticism	3.78	1.39	.31**		
	Narcissism	-.20	.21	-.14		
Step 2					.01	.54
	DANVA2-V	-.42	.51	-.09		
Step 3					.00	.54
	Post-D Abs V	.25	.39	.08		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 43
Hierarchical Regression Analysis with Personality, DANVA2-V, and Post-D Abs V as Predictors of Social Connectedness

Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 99)					
Step1				--	.21**
Conscientiousness	4.04	2.04	.21†		
Extraversion	4.56	1.83	.28*		
Agreeableness	1.85	2.12	.09		
Neuroticism	-1.23	1.72	-.08		
Narcissism	.06	.24	.03		
Step 2				.01	.22
DANVA2-V	.56	.62	.09		
Step 3				.00	.22
Post-D Abs V	-.32	.42	-.08		
Males (n = 49)					
Step1				--	.54**
Conscientiousness	-2.14	2.74	-.11		
Extraversion	7.68	2.52	.44**		
Agreeableness	7.67	2.92	.36*		
Neuroticism	-5.63	1.86	-.34**		
Narcissism	.27	.28	.14		
Step 2				.00	.54
DANVA2-V	.17	.69	.03		
Step 3				.00	.54
Post-D Abs V	.14	.52	.03		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 44
Hierarchical Regression Analysis with Personality, DANVA2-V, and Post-D Abs V as Predictors of Likability

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 93)						
Step1					--	.04*
	Narcissism	.19	.09	.21*		
Step 2					.01	.05
	DANVA2-V	.29	.30	.10		
Step 3					.02	.07
	Post-D Abs V	-.32	.22	-.15		
Males (n = 44)						
Step1					--	.03
	DANVA2-V	.34	.31	.17		
Step 2					.00	.03
	Post-D Abs V	.07	.24	.04		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 45
Hierarchical Regression Analysis with Personality, DANVA2-V, and Post-D Comp V as Predictors of Loneliness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 101)						
Step1					--	.32**
	Conscientiousness	-3.80	1.30	-.29**		
	Extraversion	-3.76	1.13	-.34**		
	Agreeableness	-1.65	1.35	-.12		
	Neuroticism	1.14	1.09	.10		
	Narcissism	-.02	.15	-.02		
Step 2					.00	.32
	DANVA2-V	-.13	.39	-.03		
Step 3					.00	.32
	Post-D Comp V	-.11	.90	-.01		
Males (n = 49)						
Step1					--	.53**
	Conscientiousness	1.44	2.04	.10		
	Extraversion	-4.16	1.88	-.32*		
	Agreeableness	-7.60	2.18	-.48**		
	Neuroticism	3.78	1.39	.31**		
	Narcissism	-.20	.21	-.14		
Step 2					.01	.54
	DANVA2-V	-.42	.51	-.09		
Step 3					.01	.55
	Post-D Comp V	1.20	1.49	.09		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 46
Hierarchical Regression Analysis with Personality, DANVA2-V, and Post-D Comp V as Predictors of Social Connectedness

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 99)						
Step1					--	.21**
	Conscientiousness	4.04	2.04	.21†		
	Extraversion	4.56	1.83	.28*		
	Agreeableness	1.85	2.12	.09		
	Neuroticism	-1.23	1.72	-.08		
	Narcissism	.06	.24	.03		
Step 2					.01	.22
	DANVA2-V	.56	.62	.09		
Step 3					.00	.22
	Post-D Comp V	-1.30	1.37	-.09		
Males (n = 49)						
Step1					--	.54**
	Conscientiousness	-2.14	2.74	-.11		
	Extraversion	7.68	2.52	.44		
	Agreeableness	7.67	2.92	.36		
	Neuroticism	-5.63	1.86	-.34		
	Narcissism	.27	.28	.14		
Step 2					.00	.54
	DANVA2-V	.17	.69	.03		
Step 3					.01	.55
	Post-D Comp V	-1.91	2.00	-.10		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 47
Hierarchical Regression Analysis with Personality, DANVA2-V, and Post-D Comp V as Predictors of Social Likability

	Variable	*B*	SEB	*β*	ΔR^2	R^2
Females (n = 93)						
Step1					--	.04*
	Narcissism	.19	.09	.21*		
Step 2					.01	.05
	DANVA2-V	.29	.30	.10		
Step 3					.00	.05
	Post-D Comp V	-.30	.64	-.05		
Males (n = 44)						
Step1					--	.03
	DANVA2-V	.34	.31	.17		
Step 2					.00	.03
	Post-D Comp V	.22	1.03	.03		

Note. $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 48
Factorial Analysis of Variance Examining Impact of Direction of Discrepancy (between Pre-DANVA2 Absolute Faces Estimate and Actual Faces Raw Score) and Gender on Social Adjustment

Factor	df	MS	*F*	η^2
UCLA Loneliness Total Score				
(Conscientiousness)	1	1014.80	15.42**	.10
(Neuroticism)	1	760.55	11.56**	.07
Discrepancy Direction	2	52.41	.80	.01
Gender	1	7.35	.11	.00
Discrepancy Direction x Gender	2	5.27	.08	.00
Social Connectedness Scale Total Score				
(Conscientiousness)	1	1353.68	9.58**	.06
(Neuroticism)	1	1024.49	7.25**	.05
Discrepancy Direction	2	70.58	.50	.01
Gender	1	232.19	1.64	.01
Discrepancy Direction x Gender	2	90.72	.64	.01
Reysen Likability Scale Summary Score				
Discrepancy Direction	2	20.70	.72	.01
Gender	1	84.45	2.97	.02
Discrepancy Direction x Gender	2	139.72	4.92**	.07

Note. Covariates indicated with parentheses; $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 49
Factorial Analysis of Variance Examining Impact of Direction of Discrepancy (between Pre-DANVA2 Comparative Faces Estimate and Actual Faces Comparative Status) and Gender on Social Adjustment

Factor	df	MS	*F*	η^2
		UCLA Loneliness Total Score		
(Agreeableness)	1	528.62	8.75**	.06
(Conscientiousness)	1	386.01	6.39*	.04
(Neuroticism)	1	447.75	7.41**	.05
Discrepancy Direction	2	85.29	1.41	.02
Gender	1	8.45	.14	.00
Discrepancy Direction x Gender	2	125.33	2.07	.03
		Social Connectedness Scale Total Score		
(Agreeableness)	1	552.65	4.12*	.03
(Conscientiousness)	1	567.34	4.22*	.03
(Neuroticism)	1	620.16	4.62*	.03
Discrepancy Direction	2	196.73	1.47	.02
Gender	1	21.45	.16	.00
Discrepancy Direction x Gender	2	271.78	2.02	.03
		Reysen Likability Scale Summary Score		
Discrepancy Direction	2	22.20	.74	.01
Gender	1	8.88	.30	.00
Discrepancy Direction x Gender	2	17.49	.58	.01

Note. Covariates indicated with parentheses; $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 50
Factorial Analysis of Variance Examining Impact of Direction of Discrepancy (between Pre-DANVA2 Absolute Voices Estimate and Actual Voices Raw Score) and Gender on Social Adjustment

Factor	df	MS	*F*	η^2
UCLA Loneliness Total Score				
(Conscientiousness)	1	1090.30	16.76**	.10
(Neuroticism)	1	686.48	10.55**	.07
Discrepancy Direction	2	39.19	.60	.01
Gender	1	.85	.01	.00
Discrepancy Direction x Gender	2	13.34	.21	.00
Social Connectedness Scale Total Score				
(Conscientiousness)	1	1510.09	10.82**	.07
(Neuroticism)	1	901.34	6.46*	.04
Discrepancy Direction	2	39.60	.28	.00
Gender	1	345.07	2.47	.02
Discrepancy Direction x Gender	2	111.89	.80	.01
Reysen Likability Scale Summary Score				
Discrepancy Direction	2	12.08	.40	.01
Gender	1	12.07	.40	.00
Discrepancy Direction x Gender	2	23.25	.77	.01

Note. Covariates indicated with parentheses; $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 51
Factorial Analysis of Variance Examining Impact of Direction of Discrepancy (between Pre-DANVA2 Comparative Voices Estimate and Actual Voices Comparative Status) and Gender on Social Adjustment

Factor	df	MS	*F*	η^2
UCLA Loneliness Total Score				
(Conscientiousness)	1	1004.82	15.53**	.10
(Neuroticism)	1	777.55	12.02**	.08
Discrepancy Direction	2	17.56	.27	.0
Gender	1	5.35	.08	.00
Discrepancy Direction x Gender	2	35.98	.56	.01
Social Connectedness Scale Total Score				
(Conscientiousness)	1	1423.54	10.17**	.07
(Neuroticism)	1	1177.12	8.41**	.06
Discrepancy Direction	2	80.48	.58	.01
Gender	1	160.37	1.15	.01
Discrepancy Direction x Gender	2	4.97	.04	.00
Reysen Likability Scale Summary Score				
Discrepancy Direction	2	37.79	1.26	.02
Gender	1	5.24	.18	.00
Discrepancy Direction x Gender	2	10.65	.36	.01

Note. Covariates indicated with parentheses; $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 52
Factorial Analysis of Variance Examining Impact of Direction of Discrepancy (between Post-DANVA2 Absolute Faces Estimate and Actual Faces Raw Score) and Gender on Social Adjustment

Factor	df	MS	*F*	η^2
UCLA Loneliness Total Score				
(Agreeableness)	1	455.65	7.41**	.05
(Conscientiousness)	1	474.77	7.73**	.05
(Neuroticism)	1	598.04	9.73**	.06
Discrepancy Direction	2	22.25	.36	.01
Gender	1	206.19	3.36†	.02
Discrepancy Direction x Gender	2	162.35	2.64†	.04
Social Connectedness Scale Total Score				
(Agreeableness)	1	575.85	4.24*	.03
(Conscientiousness)	1	611.77	4.51*	.03
(Neuroticism)	1	990.12	7.29**	.05
Discrepancy Direction	2	19.15	.14	.00
Gender	1	58.75	.43	.00
Discrepancy Direction x Gender	2	261.02	1.92	.03
Reysen Likability Scale Summary Score				
Discrepancy Direction	2	112.44	3.88*	.06
Gender	1	9.58	.33	.00
Discrepancy Direction x Gender	2	29.69	1.02	.02

Note. Covariates indicated with parentheses; †$p < .10$; *$p < .05$; **$p < .01$.

Table 53
Factorial Analysis of Variance Examining Impact of Direction of Discrepancy (between Post-DANVA2 Comparative Faces Estimate and Actual Faces Comparative Status) and Gender on Social Adjustment

Factor	df	MS	*F*	η^2
UCLA Loneliness Total Score				
(Conscientiousness)	1	705.31	11.13**	.07
(Neuroticism)	1	798.05	12.59**	.08
Discrepancy Direction	2	143.43	2.26	.03
Gender	1	.72	.01	.00
Discrepancy Direction x Gender	2	98.05	1.55	.04
Social Connectedness Scale Total Score				
(Conscientiousness)	1	871.32	6.43*	.04
(Neuroticism)	1	1165.23	8.60**	.06
Discrepancy Direction	2	219.85	1.622	.02
Gender	1	65.97	.49	.00
Discrepancy Direction x Gender	2	346.07	2.55†	.04
Reysen Likability Scale Summary Score				
Discrepancy Direction	2	42.30	1.41	.02
Gender	1	7.94	.26	.00
Discrepancy Direction x Gender	2	8.01	.27	.00

Note. Covariates indicated with parentheses; $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Table 54
Factorial Analysis of Variance Examining Impact of Direction of Discrepancy (between Post-DANVA2 Absolute Voices Estimate and Actual Voices Raw Score) and Gender on Social Adjustment

Factor	df	MS	*F*	η^2
UCLA Loneliness Total Score				
(Agreeableness)	1	406.23	6.66*	.04
(Conscientiousness)	1	636.93	10.44**	.07
(Neuroticism)	1	546.28	8.95**	.06
Discrepancy Direction	2	26.68	.44	.01
Gender	1	59.96	.98	.01
Discrepancy Direction x Gender	2	78.23	1.28	.02
Social Connectedness Scale Total Score				
(Agreeableness)	1	477.15	3.51†	.02
(Conscientiousness)	1	953.38	7.01**	.05
(Neuroticism)	1	956.08	7.03**	.05
Discrepancy Direction	2	60.49	.45	.01
Gender	1	2.24	.02	.00
Discrepancy Direction x Gender	2	82.48	.61	.01
Reysen Likability Scale Summary Score				
Discrepancy Direction	2	8.11	.27	.00
Gender	1	7.46	.25	.00
Discrepancy Direction x Gender	2	7.96	.26	.00

Note. Covariates indicated with parentheses; †$p < .10$; *$p < .05$; **$p < .01$.

Table 55
Factorial Analysis of Variance Examining Impact of Direction of Discrepancy (between Post-DANVA2 Comparative Voices Estimate and Actual Voices Comparative Status) and Gender on Social Adjustment

Factor	df	MS	*F*	η^2
UCLA Loneliness Total Score				
(Conscientiousness)	1	1070.10	16.39**	.10
(Neuroticism)	1	769.39	11.78**	.07
Discrepancy Direction	2	11.57	.18	.00
Gender	1	2.39	.04	.00
Discrepancy Direction x Gender	2	2.21	.03	.00
Social Connectedness Scale Total Score				
(Conscientiousness)	1	1437.86	10.25**	.07
(Neuroticism)	1	1205.99	8.60**	.06
Discrepancy Direction	2	66.63	.48	.01
Gender	1	126.15	.90	.01
Discrepancy Direction x Gender	2	.31	.00	.00
Reysen Likability Scale Summary Score				
Discrepancy Direction	2	16.17	.53	.01
Gender	1	4.25	.14	.00
Discrepancy Direction x Gender	2	9.89	.33	.01

Note. Covariates indicated with parentheses; $^{\dagger}p < .10$; $*p < .05$; $**p < .01$.

Appendix A

Thinking about myself – Questionnaire # 1

Instructions: Please complete each of the following statements. Do your best to estimate how you think you would perform on these tasks by choosing a percentage from the scale given below each statement. As you can see, there are 25 possible responses for the first statement and 7 possible responses for the other statements.

Circle only *one response* to complete each statement. Higher percentages are associated with better performance (i.e., getting more answers correct); lower percentages are associated with worse performance (i.e., getting fewer answers correct). Anchors have been provided for each scale to guide you as you select your responses.

1.) I think that I would correctly recognize _____ % of emotions on a test that measured my ability to recognize emotions in facial expressions.

You correctly recognize NO emotions												*You correctly recognize half of the emotions*												*You correctly recognize all emotions*
↓												↓												↓
0%	4%	8%	13%	17%	21%	25%	29%	33%	38%	42%	46%	50%	54%	58%	63%	67%	71%	75%	79%	83%	88%	92%	96%	100%

On the same kind of test…

2.) I think that I would correctly recognize _____ % of happy facial expressions.

You correctly recognize NO emotions			*You correctly recognize half of the emotions*			*You correctly recognize all emotions*
↓			↓			↓
0%	17%	33%	50%	67%	83%	100%

3.) I think that I would correctly recognize _____ % of sad facial expressions.

You correctly recognize NO emotions			*You correctly recognize half of the emotions*			*You correctly recognize all emotions*
↓			↓			↓
0%	17%	33%	50%	67%	83%	100%

4.) I think that I would correctly recognize _____ % of angry facial expressions.

You correctly recognize NO emotions			*You correctly recognize half of the emotions*			*You correctly recognize all emotions*
↓			↓			↓
0%	17%	33%	50%	67%	83%	100%

5.) I think that I would correctly recognize _____ % of fearful facial expressions.

You correctly recognize NO emotions			*You correctly recognize half of the emotions*			*You correctly recognize all emotions*
↓			↓			↓
0%	17%	33%	50%	67%	83%	100%

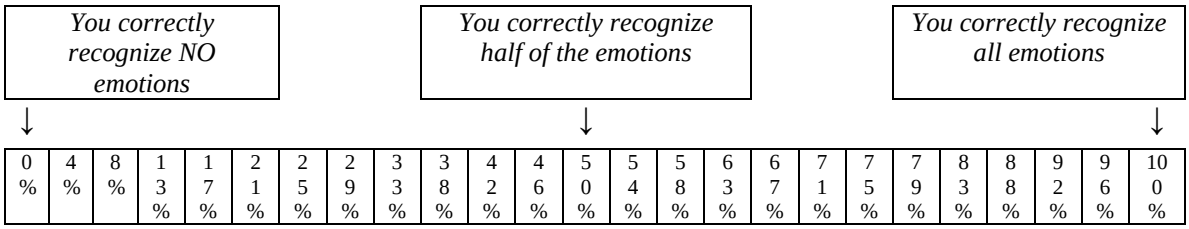
Appendix B

Thinking about myself – Questionnaire # 2

Instructions: Please complete each of the following statements. Do your best to estimate how you think you would perform on these tasks by choosing a percentage from the scale given below each statement. As you can see, there are 25 possible responses for the first statement and 7 possible responses for the other statements.

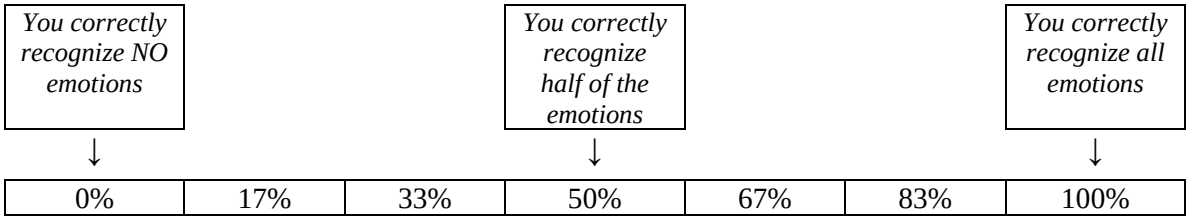
Circle only *one response* to complete each statement. Higher percentages are associated with better performance (i.e., getting more answers correct); lower percentages are associated with worse performance (i.e., getting fewer answers correct). Anchors have been provided for each scale to guide you as you select your responses.

1.) I think that I would correctly recognize _____ % of emotions on a test that measured my ability to recognize emotions in vocal expressions (i.e., tones of voice).

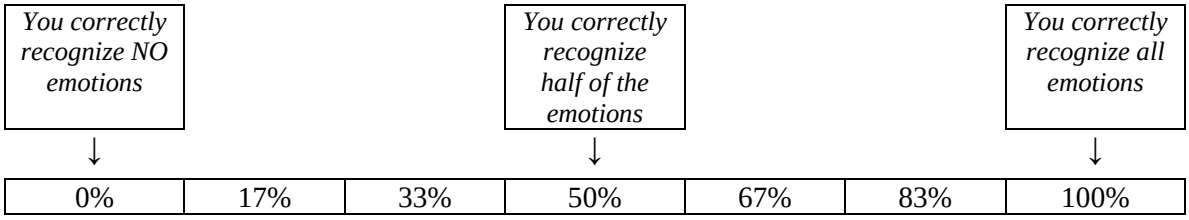


On the same kind of test…

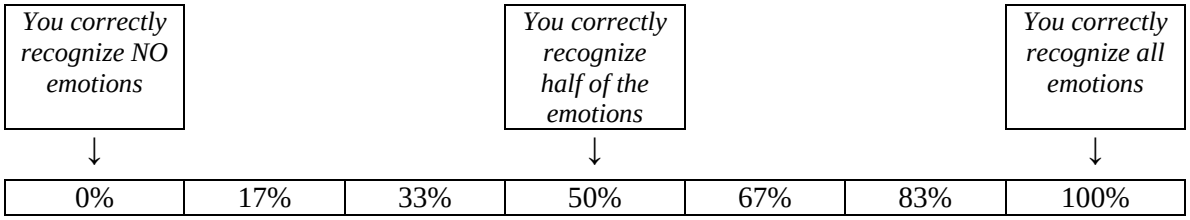
2.) I think that I would correctly recognize _____ % of happy vocal expressions.



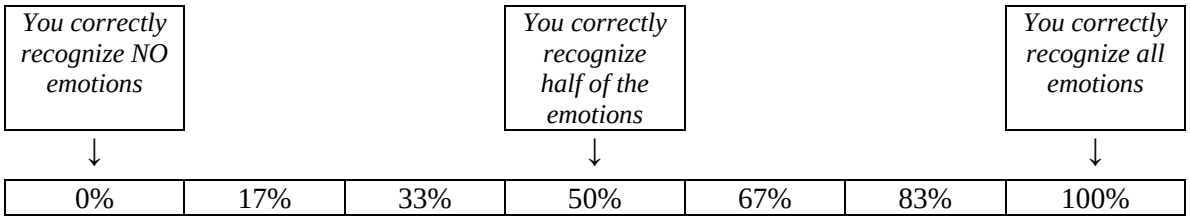
3.) I think that I would correctly recognize _____ % of sad vocal expressions.



4.) I think that I would correctly recognize _____ % of angry vocal expressions.



5.) I think that I would correctly recognize _____ % of fearful vocal expressions.



Appendix C

Thinking about myself in relation to my peers – Questionnaire # 3

Instructions: Please complete each of the following statements. Do your best to estimate how you think you would perform on these tasks *in comparison to other students at your university*. For example, if you choose "Average," that means you think your performance would be similar to most other students at your university. Circle only *one response* for each statement.

1.) Compared to other students at my university, I think that my performance on a test that measured my ability to correctly recognize emotions in facial expressions would be:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

2.) Compared to other students at my university, I think that my ability to correctly recognize happy facial expressions would be:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

3.) Compared to other students at my university, I think that my ability to correctly recognize sad facial expressions would be:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

4.) Compared to other students at my university, I think that my ability to correctly recognize angry facial expressions would be:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

5.) Compared to other students at my university, I think that my ability to correctly recognize fearful facial expressions would be:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

Appendix D

Thinking about myself in relation to my peers – Questionnaire # 4

Instructions: Please complete each of the following statements. Do your best to estimate how you think you would perform on these tasks *in comparison to other students at your university*. For example, if you choose "Average," that means you think your performance would be similar to most other students at your university. Circle only *one response* for each statement.

1.) Compared to other students at my university, I think that my performance on a test that measured my ability to correctly recognize emotions in vocal expressions (i.e., tones of voice) would be:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

2.) Compared to other students at my university, I think that my ability to correctly recognize happy vocal expressions would be:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

3.) Compared to other students at my university, I think that my ability to correctly recognize sad vocal expressions would be:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

4.) Compared to other students at my university, I think that my ability to correctly recognize angry vocal expressions would be:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

5.) Compared to other students at my university, I think that my ability to correctly recognize fearful vocal expressions would be:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

Appendix E

Thinking about myself – Questionnaire # 5

Instructions: Please complete each of the following statements. Do your best to estimate how you think you performed on these tasks by choosing a percentage from the scale given below each statement. As you can see, there are 25 possible responses for the first statement and 7 possible responses for the other statements.

Circle only *one response* to complete each statement. Higher percentages are associated with better performance (i.e., getting more answers correct); lower percentages are associated with worse performance (i.e., getting fewer answers correct). Anchors have been provided for each scale to guide you as you select your responses. It is OK if your responses have changed. It is also OK if your responses have not changed.

1.) I think that I correctly recognized _____ % of emotions on a test that measured my ability to recognize emotions in facial expressions.

You correctly recognize NO emotions ↓ | *You correctly recognize half of the emotions* ↓ | *You correctly recognize all emotions* ↓

0%	4%	8%	13%	17%	21%	25%	29%	33%	38%	42%	46%	50%	54%	58%	63%	67%	71%	75%	79%	83%	88%	92%	96%	100%

On the same kind of test…

2.) I think that I correctly recognized _____ % of happy facial expressions.

You correctly recognize NO emotions ↓ | *You correctly recognize half of the emotions* ↓ | *You correctly recognize all emotions* ↓

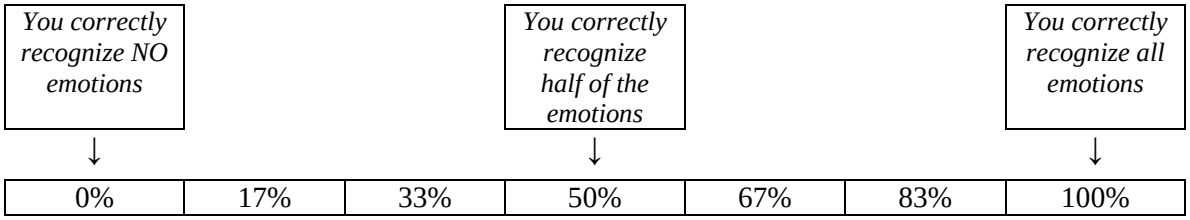
0%	17%	33%	50%	67%	83%	100%

3.) I think that I correctly recognized _____ % of sad facial expressions.

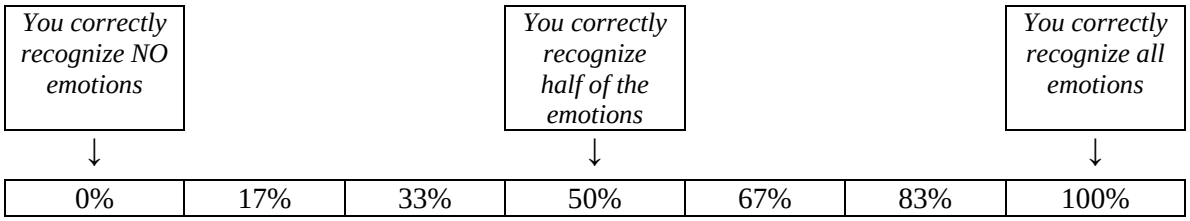
You correctly recognize NO emotions ↓ | *You correctly recognize half of the emotions* ↓ | *You correctly recognize all emotions* ↓

0%	17%	33%	50%	67%	83%	100%

4.) I think that I correctly recognized _____ % of angry facial expressions.



5.) I think that I correctly recognized _____ % of fearful facial expressions.



Appendix F

Thinking about myself – Questionnaire # 6

Instructions: Please complete each of the following statements. Do your best to estimate how you think you performed on these tasks by choosing a percentage from the scale given below each statement. As you can see, there are 25 possible responses for the first statement and 7 possible responses for the other statements.

Circle only *one response* to complete each statement. Higher percentages are associated with better performance (i.e., getting more answers correct); lower percentages are associated with worse performance (i.e., getting fewer answers correct). Anchors have been provided for each scale to guide you as you select your responses. It is OK if your responses have changed. It is also OK if your responses have not changed.

1.) I think that I correctly recognized _____ % of emotions on a test that measured my ability to recognize emotions in vocal expressions (i.e., tones of voice).

You correctly recognize NO emotions ↓ | *You correctly recognize half of the emotions* ↓ | *You correctly recognize all emotions* ↓

0%	4%	8%	13%	17%	21%	25%	29%	33%	38%	42%	46%	50%	54%	58%	63%	67%	71%	75%	79%	83%	88%	92%	96%	100%

On the same kind of test…

2.) I think that I correctly recognized _____ % of happy vocal expressions.

You correctly recognize NO emotions ↓ | *You correctly recognize half of the emotions* ↓ | *You correctly recognize all emotions* ↓

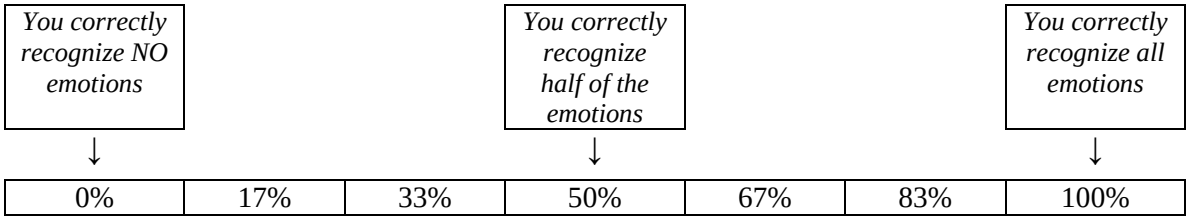
0%	17%	33%	50%	67%	83%	100%

3.) I think that I correctly recognized _____ % of sad vocal expressions.

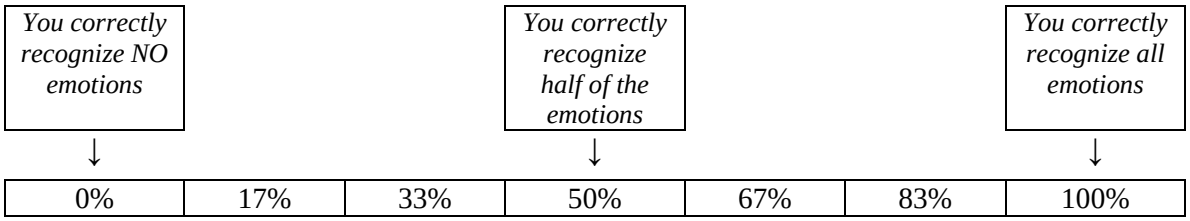
You correctly recognize NO emotions ↓ | *You correctly recognize half of the emotions* ↓ | *You correctly recognize all emotions* ↓

0%	17%	33%	50%	67%	83%	100%

4.) I think that I correctly recognized _____ % of angry vocal expressions.



5.) I think that I correctly recognized _____ % of fearful vocal expressions.



Appendix G

Thinking about myself in relation to my peers – Questionnaire # 7

Instructions: Please complete each of the following statements. Do your best to estimate how you think you performed on these tasks *in comparison to other students at your university*. For example, if you choose "Average," that means you think your performance was similar to most other students at your university. Circle only *one response* for each statement. It is OK if your responses have changed. It is also OK if your responses have not changed.

1.) Compared to other students at my university, I think that my performance on a test that measured my ability to correctly recognize emotions in facial expressions was:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

2.) Compared to other students at my university, I think that my ability to correctly recognize happy facial expressions was:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

3.) Compared to other students at my university, I think that my ability to correctly recognize sad facial expressions was:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

4.) Compared to other students at my university, I think that my ability to correctly recognize angry facial expressions was:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

5.) Compared to other students at my university, I think that my ability to correctly recognize fearful facial expressions was:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

Appendix H

Thinking about myself in relation to my peers – Questionnaire # 8

Instructions: Please complete each of the following statements. Do your best to estimate how you think you performed on these tasks *in comparison to other students at your university*. For example, if you choose "Average," that means you think your performance was similar to most other students at your university. Circle only *one response* for each statement. It is OK if your responses have changed. It is also OK if your responses have not changed.

1.) Compared to other students at my university, I think that my performance on a test that measured my ability to correctly recognize emotions in vocal expressions (i.e., tones of voice) was:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

2.) Compared to other students at my university, I think that my ability to correctly recognize happy vocal expressions was:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

3.) Compared to other students at my university, I think that my ability to correctly recognize sad vocal expressions was:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

4.) Compared to other students at my university, I think that my ability to correctly recognize angry vocal expressions was:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

5.) Compared to other students at my university, I think that my ability to correctly recognize fearful vocal expressions was:

Extremely Below Average | Below Average | Average | Above Average | Extremely Above Average

Appendix I

Demographics Questionnaire

1.) What is your gender (please circle one)?

Male Female Other

If you circled "other," please briefly describe: _____

2.) What is your current age (in years)? _____

3.) What is your current year in college (please circle one)?

Freshman Sophomore Junior Senior Other

If you circled "other," please briefly describe: _____

4.) What is your current college major? _____

5.) How would you describe your racial/ethnic identity (please circle all that apply)?

American Indian/ Native American	Asian	Black/ African American	Hispanic/ Latino	White/ Caucasian	Pacific Islander	Other

If you circled "other," please briefly describe: _____