

EXPLORING THE LINK BETWEEN CONSCIENTIOUSNESS AND POSITIVE AFFECT

BY

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DISSERTATION

Submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in Psychology
in the Graduate College of the
University of Illinois at Urbana-Champaign, 2012

Urbana, Illinois

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ABSTRACT

Previous research has indicated a relationship between conscientiousness and positive emotions (e.g., DeNeve & Cooper, 1998). However, no research to date has addressed why conscientiousness is related to emotions or to which emotions it is related. Across three studies, I aimed to explicate the relationship between conscientiousness and positive affect. In Study 1, I used meta-analysis to show that conscientiousness is related to a variety of positive emotions and overall positive affect, but that attentiveness and authentic pride were most strongly associated with conscientiousness. Further, Study 1 showed that attentiveness fully accounted for the relation between conscientiousness and positive affect. Study 2 ($N = 274$) tested the relationship between individual facets of conscientiousness and positive affect and found that industriousness and responsibility were most strongly related to positive affect. Study 2 replicated results from Study 1 showing that attentiveness fully mediated the relation between conscientiousness and positive affect. Additionally, Study 2 showed that the relation between conscientiousness and positive affect was not due to overlap with extraversion and neuroticism. Study 3 ($N = 270$) examined the interplay among conscientiousness, positive affect, and performance on two exams in a short-term longitudinal study. Industriousness and self-control predicted higher scores on exam 1, and high scores on exam 1 predicted experiencing positive emotions about exam performance; however, scores on exam 1 did not mediate the relationship between facets of conscientiousness and specific emotions. Additionally, experiencing positive feelings about one's performance on the first exam did not explain improvement on a later exam. These three studies show that attentiveness and pride are the primary positive emotions associated with conscientiousness, and provide insight into the process by which conscientious individuals achieve heightened levels of positive affect.

ACKNOWLEDGEMENTS

I owe many people a debt of gratitude for their help in making this dissertation come to fruition. Thanks to Brent Roberts for all his help and guidance. Additional thanks go to my doctoral committee members, Howard Berenbaum, Chris Fraley, Dan Newman, and Reed Larson, for all their helpful ideas. I am thankful for all the moral support, feedback, and friendship from Pat Hill and Michelle Schoenleber—you were both lifesavers. I could not have done this without the support of my dear friends and family who supported me all the way; especially Joanne Carroll, who supplied me with endless dinners and pies. And most of all, thanks go to my wonderful husband, Nathan, who so graciously put up with me during this entire process. I could not have done this without his never-ending love and support.

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CHAPTER 1

INTRODUCTION

Personality traits have been defined as neurophysiological structures underlying relatively enduring patterns of thoughts, *feelings*, and behaviors that represent a readiness to respond in particular ways to specific environmental cues (Roberts & Jackson, 2008; Tellegen, 1991). This definition implies that affect is a core dimension of personality traits. For example, there is an extensive body of literature linking extraversion with positive affect and neuroticism with negative affect (e.g., Costa & McCrae, 1980; Lucas, Diener, Grob, Suh, & Shao, 2000; Tellegen, 1985; Watson & Clark, 1992). Extraversion entails having an “energetic approach” to life, characterized by sociability, physical activity, assertiveness, and positive emotionality. Neuroticism, on the other hand, describes the opposite pole of emotional stability and even-temperedness, and consists of moodiness, anxiety, and nervousness (John & Srivastava, 1999). It is readily apparent from these definitions that extraversion and neuroticism have a prominent emotional component. A popular personality inventory, the NEO-PI-R (Costa & McCrae, 1992), lists “positive emotions” as a facet scale of extraversion. Similarly, items describing high neuroticism in personality inventories contain words such as “anxious,” “depressed,” and “moody” (John, Naumann, & Soto, 2008). In fact, the links between extraversion and positive affect, and neuroticism and negative affect, are so robust that some researchers (e.g., Tellegen, 1985) have gone as far as to propose that extraversion and neuroticism be re-named as “positive emotionality” and “negative emotionality,” respectively.

While a great deal is known about the affective structure of extraversion and neuroticism, there remains a need to discover the affective structure of the remaining three Big Five personality traits. Some research has been conducted on the emotional components of

conscientiousness, agreeableness, and openness to experience, but not enough to draw firm conclusions as to the specific emotions that underlie these traits. Personality traits predict a wide variety of important life outcomes such as marital success, occupational attainment, and mortality (Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007), so understanding the mechanisms, such as emotion, through which personality affects these outcomes is vitally important for the study of personality. For example, one study found that the relation between extraversion and stronger interpersonal relationships is specifically explained by the positive affect component of extraversion (Lucas & Diener, 2001).

The current series of studies aims to explore the relation between conscientiousness and emotion, and in particular, positive affect, and to discover what specific emotions or families of emotions are responsible for this association. I will first present an overview of the conceptual overlap and distinctions made between personality traits and affect. Second, I will describe conscientiousness and review the existing literature on its associations with emotion. Next, I will propose some theories as to why we would expect conscientiousness to be related to positive affect, and will review the literature on two specific emotions, pride and attentiveness, that I hypothesize to be the key positive emotions associated with conscientiousness and that will explain the relation between conscientiousness and positive emotion. Finally, I will describe the current set of studies, which addressed three main questions about the nature of the relationship between conscientiousness and positive affect: 1) Which specific emotions are related to conscientiousness, and do these emotions account for the relation between conscientiousness and overall positive affect? 2) What specific aspects of conscientiousness are responsible for the relation with positive affect? and 3) How do conscientiousness and emotion work together to produce behavioral outcomes such as academic achievement?

Conceptual Relation Between Personality Traits and Affect

The sociogenomic model of personality traits (Roberts & Jackson, 2008) was put forth as an update to traditional biological models of personality traits (e.g., Eysenck, 1967) which hold that biological influences on personality traits are causal and unchangeable. Particularly important to the current discussion is the sociogenomic model's emphasis on states; that is, a person's immediate emotional, cognitive, or behavioral reactions to his or her environment. The sociogenomic model specifies that the environment does not directly alter personality traits, but rather, acts through states. If the environment causes certain states, such as feeling positive affect, to be experienced consistently over time, these states can eventually become reflected in the personality trait (Fleeson, 2001). Thus, states serve a crucial mediating role between changes in the environment and changes in one's personality.

One particular type of state, affect, refers to the conscious experience of emotion. How, then, does affect relate to personality traits? There are a few possibilities. First, affect may be a kind of trait in and of itself. While affect can be experienced momentarily as a state, it can also be experienced habitually, as one of a person's core characteristics. For example, if someone is constantly experiencing states of happiness, "happy" could be considered an integral part of the person's personality. Second, affect could represent one component of personality traits such as the big five (extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience). For example, affect is often cited as comprising part of what it means to be extraverted, as the experience of positive emotions is often considered to be a facet of extraversion (e.g., Costa & McCrae, 1992). In this case, affect would be one specific trait in a cluster of several narrower traits that hang together under the broad umbrella of extraversion. Third, it is possible that affect is a product of traits. For example, if a person is conscientious,

being responsible, self-controlled, and productive would lead to feeling more positive affect. Thus, affect would be a result of expressing one's personality traits rather than being an actual component of a personality trait.

Conscientiousness

Conscientiousness is the tendency to be planful, organized, task- and goal-oriented, and self-controlled, to delay gratification, and to follow socially-prescribed norms and rules (John & Srivastava, 1999). Since the definition of conscientiousness, unlike that of extraversion and neuroticism, does not directly include emotional content, it has not been the primary focus of research on emotion and personality. Despite the absence of a clear affective dimension underlying conscientiousness, a meta-analysis of 148 studies found that conscientiousness was significantly related to overall positive and negative affect, life satisfaction, and happiness (DeNeve & Cooper, 1998). Interestingly, the magnitudes of these relationships were similar to correlations between affect and extraversion and neuroticism. Even more surprising is that results were obtained despite the fact that the majority of studies included in this meta-analysis were conducted prior to the widespread use of modern Big Five personality measures. Thus, many of the studies labeled as assessing conscientiousness actually only included variables that were conceptually related to conscientiousness, such as internal locus of control (DeNeve & Cooper, 1998), rather than formal measures of conscientiousness. A more recent meta-analysis (Heller, Watson, & Ilies, 2004) which examined studies that used newer, formal measures of conscientiousness found an even more prominent relation between conscientiousness and life satisfaction. While life satisfaction may not be affect *per se*, the larger correlations with life satisfaction that were found when using newer, more sophisticated measures of

conscientiousness may indicate that even stronger correlations exist between conscientiousness and positive and negative affect than those that have previously been reported.

A few studies have examined the relation between conscientiousness and specific emotions that make up the broader categories of positive and negative affect. In terms of negative affect, conscientiousness has been linked to guilt, shame, and guilt- and shame-proneness (Abe, 2003; Einstein & Lanning, 1998; Fayard, Roberts, Robins, & Watson, 2012; Fee & Tangney, 2000). A recent series of three studies conducted an in-depth investigation into the negative affective component of conscientiousness (Fayard et al., 2012). The first study used meta-analysis to examine the relation between conscientiousness and the negative basic emotions. While conscientiousness was significantly related to anger, sadness, fear, disgust, and surprise, guilt showed the strongest relationship with conscientiousness. Further, conscientiousness was negatively related to experiencing guilt, but positively related to guilt-proneness, the propensity to experience guilt upon doing something wrong. The relationship between conscientiousness and guilt accounted for the association between conscientiousness and broader negative affect. These results were replicated in a second study, which also found that the relation between conscientiousness and guilt remained significant even after controlling for extraversion and neuroticism, indicating that the emotional content associated with conscientiousness is not merely a result of overlap with extraversion and neuroticism. Finally, in a short-term longitudinal study, conscientiousness predicted the trait experience of guilt, which, in turn, predicted affect about current academic behavior, as well as future academic performance.

In addition to these findings, low conscientiousness has been implicated in several major emotional outcomes, such as the mood and anxiety disorders. In a recent twin study,

conscientiousness was the second strongest factor next to neuroticism in predicting depression (Kendler & Myers, 2009). Another recent study found that conscientiousness was the second strongest big five predictor of major depression and other unipolar mood disorders, as well as anxiety disorders (Kotov, Gamez, Schmidt, & Watson, 2010).

The research reviewed above indicates that conscientiousness has definite ties to emotions and emotional outcomes. However, this is surprising, given the lower-order structure of conscientiousness. Research has identified five replicable facets of conscientiousness, which include order, responsibility, industriousness, impulse control, and conventionality (Roberts, Walton, & Bogg, 2005). These facets are largely concerned with behaviors, and it is not clear at first glance what role emotion plays. However, the seemingly behavioral nature of conscientiousness may, paradoxically, be the key to its link with positive emotion.

Why would conscientiousness be related to positive affect?

In general, performing conscientious behaviors such as being industrious, responsible, and self-controlled should allow people to act in ways that are valued by society. Because of their tendency to adhere to socially prescribed norms and expectations, conscientious individuals are selected into or create environments in which they can achieve positive outcomes (Roberts, Wood, & Caspi, 2008). For example, employers desire to have workers who are conscientious and efficient; thus, conscientious individuals are able to attain higher status and higher paying jobs than individuals who are low in conscientiousness (Judge, Higgins, Thoresen, & Barrick, 1999). Also, since conscientiousness is socially valued, exercising conscientiousness should evoke positive responses from others in the individual's social world (Caspi & Bem, 1990). In this way, people who “follow the rules” and achieve will be rewarded by others in terms of praise, recognition, and even further opportunities for advancement, which should lead to

experiencing more positive affect and less negative affect. Conversely, people low in conscientiousness that “break the rules” or fail to achieve are punished by society by being “de-selected” from certain situations and by receiving negative social feedback from others (Roberts, Wood, & Caspi, 2008). Finally, conscientious individuals should react to these positive responses from others in ways that reinforce their conscientious behavior; in other words, a desire to continue being conscientious in order to receive further praise (Caspi & Bem, 1990; Roberts, Wood, & Caspi, 2008). Through these selection, evocation, and reactance conscientious people create social situations which should lead to positive affect (Roberts, Wood, & Caspi, 2008).

These selection effects can be readily observed in the area of academic achievement. Conscientiousness has been found to be strongly related to academic achievement, including attaining higher grade-point averages, above and beyond cognitive ability (Nofle & Robins, 2007; Poropat 2009). In order to achieve in most academic settings, a certain set of rules and procedures must be followed. Students must typically attend class, study, and work hard to score highly on tests and achieve good grades. Often, the work associated with earning good grades necessitates students controlling their impulses to party all night or to miss class. Thus, by being industrious and self-disciplined, students are rewarded with good grades, which can open doors for higher job attainment or admission to graduate school. Being rewarded for being conscientious should lead to increased positive affect, as well as increased motivation to receive these rewards in other areas of life and in the future.

Conscientious individuals may also be particularly adept at inoculating themselves from experiencing negative consequences. By “doing good” and “avoiding bad,” conscientious people may be better at choosing to perform behaviors whose consequences result in increased

positive affect, as well as successfully avoiding behaviors that would result in increased negative affective outcomes. For example, conscientious people typically engage in productive behaviors such as studying, and do a thorough job at the things they do. Conscientiousness is consistently inversely related to the tendency to procrastinate (Fee & Tangney, 2000). By being industrious, conscientious individuals can revel in a job well done, as well as avoid the negative feelings that come from doing an incomplete job and the anxiety associated with procrastination and looming deadlines. Similarly, behaving responsibly may engender positive feelings about one's self, such as feelings of pride and competence. Conscientious individuals are able to exercise more restraint, and can thereby avoid the negative consequences that often accompany impulsive actions. Thus, these “inoculation effects” show that conscientious people may be skilled at selecting which behaviors to engage in based on their affective consequences.

Finally, there is the potential that the relation between conscientiousness and positive affect is simply an artifact. There are two possible explanations for this hypothesis. The first is that the relation between conscientiousness and positive affect is the result of conceptual overlap between conscientiousness and extraversion (and low neuroticism) rather than the result of a genuine relationship between the two. Contrary to this hypothesis, one study has found evidence that the relation between conscientiousness and global well-being held after controlling for extraversion and neuroticism (McCrae & Costa, 1991). Another study found that conscientiousness contributed a significant amount of incremental variance in predicting positive affect even after controlling for the effect of extraversion (Watson & Clark, 1992).

this is an idea that deserves further testing before we can draw firm conclusions about the relationship between conscientiousness and emotion. The second possibility is that some items in measures of positive emotions, such as attentiveness, may overlap with conscientiousness

items, resulting in a measurement artifact. In this case, attentiveness scales would not be measuring a separate emotional dimension, but rather, aspects of conscientiousness.

Conscientiousness and positive affect

Conscientiousness has consistently been shown to be positively related to general positive affect (DeNeve & Cooper, 1998), but it is unclear which specific aspects of positive affect are responsible for this relationship. Conscientiousness has strong, positive associations with the positive affect facet of attentiveness (e.g., Watson, 2000; Watson & Clark, 1992), and has also been linked to two different conceptualizations of pride (Tracy & Robins, 2007b). Additionally, in a study containing four separate samples, conscientiousness accounted for a significant portion of the variance in positive affect in all four samples, even after controlling for extraversion (Watson & Clark, 1992). However, since few studies have examined conscientiousness and positive emotions beyond the level of overall positive affect, and since no studies to date have examined which specific emotions account for the relation between conscientiousness and positive affect, there is not enough evidence available to draw firm conclusions about the specific emotions underlying this relationship. Therefore, a systematic study is needed to elaborate on the relation between conscientiousness and positive affect. Based on the limited evidence and on theoretical reasons, which shall be elaborated upon presently, I expected that attentiveness and pride would be at the heart of the conscientiousness-positive affect relationship.

Based on recent studies on the nature of pride, pride is now widely considered to be an emotion. Although it is more cognitively complex than “basic” emotions such as joy, pride shares several features in common with basic emotions that may indicate a biological base for these emotions. For example, recent studies have revealed that pride has a distinct nonverbal

expression that includes both facial and postural elements, and this expression is recognized cross-culturally in both adults and children (Tracy & Robins, 2007a). Two differences between pride and the emotions traditionally thought of as basic are that more complex cognitive processes precede the experience of pride versus other emotions, and pride appears to serve a primarily social function rather than a survival function. The status of attentiveness as an emotion is debated, however. Some researchers cite the strong correlations between attentiveness and positive affect as evidence that attentiveness is a component of positive affect (e.g., Watson, 2000); however, attentiveness is generally described as a type of mood rather than an emotion in the traditional sense. Other emotion researchers argue that attentiveness non-emotional states (Diener, Wirtz, Biswas-Diener, Tov, Kim-Prieto, Choi, & Oishi, 2010). Attentiveness may represent a mood experience, but little research has investigated this construct to date.

Attentiveness

Attentiveness is a facet scale of positive affect that represents concepts such as alertness, concentration, and determination. The attentiveness scale of the Positive and Negative Affect Schedule – Expanded Form (PANAS-X; Watson & Clark, 1999) includes four items: alert, attentive, concentrating, and determined. While attentiveness may not be a dimension of core affect *per se* (Watson, personal correspondence), but may instead represent directing attentional resources, it is nonetheless a potential explanation for the relation between conscientiousness and positive affect.

Attentiveness appears to be a fairly unique construct in positive affect, as the PANAS-X is the only emotion measure that contains a specific attentiveness subscale. Only a few studies have published correlations between conscientiousness and attentiveness, but in the available

studies, correlations between conscientiousness and attentiveness were surprisingly high, ranging from $r = .47$ to $r = .68$ (Vaidya, Gray, Haig, Mroczek, & Watson, 2008; Watson, 2000; Watson & Clark, 1992; Watson, Hubbard, & Wiese, 2000; Watson & Naragon, 2009). Moreover, it appears that at least in these samples, attentiveness was a prominent player in the conscientiousness-positive affect relation. For example, in one study (Watson & Naragon, 2009), conscientiousness was found to correlate with overall positive affect at $r = .39$. Among the positive affect subscales, attentiveness and conscientiousness correlated at $r = .53$, while the remaining subscales (joviality and self-assurance) were correlated with conscientiousness at a much lower level ($r_s = .22$ and $.16$, respectively). Further, attentiveness was the only facet of positive affect, including overall positive affect, that was more strongly related to conscientiousness than to extraversion ($r_s = .53$ and $.28$, respectively). This result suggests that while overall positive affect and most facets of positive affect are most strongly related to extraversion, attentiveness holds a unique relation to conscientiousness.

Another study examined relations between conscientiousness and attentiveness at the facet level of conscientiousness, as measured by the NEO-PI. PANAS-X attentiveness, as well as overall positive affect, were most strongly correlated with the achievement facet of conscientiousness (Watson & Clark, 1992). Only attentiveness and overall positive affect were significantly related to all three conscientiousness facets (achievement, dependability, and orderliness), with attentiveness demonstrating the largest correlations with all three facets. Additionally, a factor analysis examining the PANAS-X scales and various measures of personality traits revealed that attentiveness loaded onto a factor consisting of three other measures of conscientiousness.

There are a few theoretical reasons why conscientiousness should be related to attentiveness. First, numerous researchers have developed models of personality and temperament that involve a “control” component (e.g., Ahadi & Rothbart, 1994; Carver, Johnson, & Joormann, 2008; Depue & Lenzenweger, 2006; Tellegen, 1985; Watson & Clark, 1993). In many of these cases, conscientiousness is virtually indistinguishable from these conceptualizations of control. For example, the temperament dimension of effortful control is directly related to adult conscientiousness (Ahadi & Rothbart, 1994; Rothbart, Posner, & Hershey, 1995). Effortful control reflects the strength of one’s attentional system; heightened attention is one of the mechanisms by which individuals are able to control or inhibit behaviors. This ability to inhibit impulsive responses allows individuals to persist at tasks that would otherwise be undesirable (Derryberry & Tucker, 2006). Derryberry and Tucker (2006) that higher attention and arousal, as generated by the reticular formation in the brain, are necessary for sustaining effortful tasks, and when the necessity to produce effortful behavior arises, parts of the brain may increase attentional resources. This boost in attention is then directed by the frontal lobe to activities such as planning and impulse control, which are key elements of conscientiousness. In this case, attentiveness might be related to conscientiousness in that attention, alertness, and concentration are important for successfully performing conscientious behaviors. Depue and Lenzenweger (2006) propose a similar model; in a discussion of the neurobehavioral systems that underlie personality traits, they describe a “nonaffective constraint” factor that serves to control emotional responses generated by the reward and inhibition systems. This system is similar to conscientiousness in that conscientious individuals actively both suppress some approach behaviors and encourage some avoidance

behaviors (for example, when unpleasant tasks need to be done). Activating attentional resources is necessary for carrying out effective nonaffective constraint.

Second, attentiveness may represent aspects of conscientiousness rather than being a separate construct. Two particular aspects of attentiveness, determination and concentration, may be responsible for this overlap. Both Peabody and de Raad (2002) and MacCann, Duckworth, and Roberts (2009) have identified persistence or perseverance, concepts that directly overlap with determination, as facets of conscientiousness. An examination of items in various conscientiousness scales provides an even more concrete link with concentration and determination. For example, in MacCann and colleagues' (2009) conscientiousness scale, an item from their industriousness facet, "I push myself very hard to succeed," seems to capture the concept of feeling determined, and another item from their procrastination refrainment scale, "I am easily distracted (reversed)," as well as the almost identical item from the Big Five Inventory (John & Srivastava, 1999), "I see myself as someone who is easily distracted," seem to assess the opposite of concentration. Indeed, studies have reported strong negative correlations between conscientiousness and a measure of distractibility (Dindo, McDade-Montez, Sharma, Watson, & Clark, 2009). With the substantial amount of overlap seen between items designed to measure conscientiousness and items of the attentiveness scale, specifically "concentrating" and "determined," it is likely that at least part of the construct of attentiveness is simply measuring the affective embodiment of conscientiousness.

Based on the research findings, it appears that a nontrivial relationship exists between conscientiousness and attentiveness. However, it is not clear precisely why attentiveness is related to conscientiousness, whether aspects of attentiveness are fully responsible for the

relation between conscientiousness and positive affect, or if more traditional emotions, such as pride, are also playing a role.

Pride

Pride refers to positive feelings about one's self or one's own accomplishments. It belongs to a particular sub-family of emotions called the self-conscious emotions, which includes pride, guilt, shame, and embarrassment (Tangney & Dearing, 2002). Among these, pride is the only positive self-conscious emotion. Self-conscious emotions are unique from basic emotions in that complex cognitive processes must take place in order for them to occur (Tracy & Robins, 2004). In particular, self-conscious emotions require individuals to reflect on their own behavior, determining whether their behavior has implications for their identity and generating cognitive appraisals as to the cause of the behavior. Thus, pride arises when individuals perform a behavior that activates positive self-representations, decide that the behavior is congruent with their identity, and then attribute that behavior to internal, specific, and unstable causes—or in other words, effort (Tracy & Robins, 2004). It has been proposed that because of the behavioral orientation of conscientiousness, along with the specialized processes in which self-conscious emotions arise, conscientiousness may be uniquely suited to the self-conscious emotions (Fayard et al., 2012; Roberts, Jackson, Fayard, Edmonds, & Meints, 2008).

Conscientious individuals appear to have a greater understanding and appreciation for rules, values, and behavioral norms. Consistent with Freud's writings on the superego (1961), conscientious people should have internalized societal standards for behavior. Because conscientious people have a clearer idea of how they should behave, they should be more adept at reflecting on their behavior and whether or not they have met their own or society's expectations. For example, individuals high in conscientiousness generally act responsibly, and

are self-controlled, productive, and traditional. When a conscientious person believes that he or she has violated a rule or standard, this behavior will be viewed as inconsistent with the image of him-or herself as a conscientious person, and the individual will subsequently experience guilt or shame. Conversely, and most pertinent to this discussion, if a conscientious person upholds rules and standards, or especially achieves some accomplishment, the person will maintain or enhance his or her image as a conscientious person and will experience feelings of pride. As was discussed previously, conscientious people tend to uphold standards and achieve success in a variety of domains, so it follows that conscientious people should experience pride on a much more regular basis than individuals who are less conscientious. This connection can be seen in the context of academic achievement; performing well in school by being conscientious should elicit pride about the student's accomplishments. Indeed, pride has been classified as an "achievement emotion" and was predicted by both mastery and performance goals for achievement (Pekrun, Elliot, & Maier, 2006).

There are two ways in which individuals can experience pride (Tracy & Robins, 2007b)—authentic, or beta, pride, and hubristic, or alpha, pride. Authentic pride is so-called because it represents the experience of pride following specific, often achievement-related accomplishments (e.g., succeeding at a difficult task), and most likely reflects genuine feelings of self-worth and self-esteem. Hubristic pride, on the other hand, involves feelings of pride based not on one's particular behavior, but rather, on one's self as a whole, without any justification (e.g., "I am awesome"). Hubristic pride may represent an aggrandized sense of self rather than a person's true feelings about him- or herself. In this way, authentic and hubristic pride have parallels to guilt and shame, respectively. Guilt involves negative feelings over a particular behavior a person committed, whereas shame involves negative feelings about the entire self as a

whole (Tangney & Dearing, 2002). Indeed, hubristic pride is positively correlated with shame-proneness, while authentic pride shows an even stronger negative correlation with shame-proneness (Tracy & Robins, 2007b). Because of the conceptual links between authentic pride and guilt, as opposed to shame, and because previous research has found a link between guilt and conscientiousness (Fayard et al., 2012), it is to be expected that authentic pride will be the form of pride most strongly associated with conscientiousness. Additionally, if pride accounts for the relation between conscientiousness and positive affect, authentic pride rather than hubristic pride should be responsible for this effect.

Pride is one of the least studied self-conscious emotions (Tracy & Robins, 2007b) and has only recently begun to receive consistent research attention. Because of this, only a few studies have examined its relation with conscientiousness. Two studies have reported significant correlations between conscientiousness and both state and trait pride, ranging from $r = .48$ to $.34$ for authentic pride and from $r = -.23$ to $-.19$ for hubristic pride (Carver, Sinclair, & Johnson, 2010; Tracy & Robins, 2007b). Perseverance and self-control, facets of conscientiousness on many personality inventories, have also been associated with pride. In one study, authentic pride was related to the perseverance scale of the Urgency-Premeditation-Perseverance-Sensation Seeking (UPPS) scale at $r = .41$ and to a self-control scale at $r = .31$, whereas hubristic pride was negatively and less strongly related to both of these constructs (Carver, et al., 2010). Finally, pride follows a similar developmental trajectory to conscientiousness, in that it tends to increase with age (Orth, Robins, & Soto, 2010).

Recently, Williams and DeSteno (2008) put forward what they call the “motivational hypothesis of pride,” in which they argue that experiencing pride about an accomplishment should prompt an individual to continue to pursue further accomplishments in that area. Their

hypothesis states that pride should particularly motivate the pursuit of short-term goals, such as achieving good grades on an exam or a standardized test. In this vein, conscientious people are likely to behave in ways that allow for the experience of pride, such as being studious or getting into a good college. This experience of pride can then motivate the conscientious student to continue to perform conscientious behaviors that will ultimately result in the further experience of pride in the academic arena.

Pride is different from other positive emotions in this respect, as general positive affect has been found to be unrelated to, or in some studies to actually reduce, motivation and perseverance (e.g., Bartlett & DeSteno, 2006; Wegener & Petty, 1994; Williams & DeSteno, 2008). Pride has also been distinguished from self-efficacy, such that motivation for future successes can be attributed to pride and not to self-efficacy (Williams & DeSteno, 2008). Thus, pride can serve as a strong motivational force (Fredrickson & Branigan, 2001) and can lead to increased perseverance (Williams & DeSteno, 2008). Together with the tendency for responsibility and hard-work associated with conscientiousness, pride could be a major contributor to the positive outcomes, such as academic excellence, that are often achieved by conscientious individuals.

Present studies

In order to assess which emotions are at the core of the relation between conscientiousness and positive affect, I conducted three studies. In the first study, I meta-analytically examined the relationship between conscientious and various facets of positive affect and specific emotions related to positive affect in order to determine which emotion or emotions are related to conscientiousness. I also used mediation analysis to test whether these emotions accounted for the relationship between conscientiousness and positive affect. Second, I examined

conscientiousness at the facet level to see whether certain facets of conscientiousness, such as industriousness, were primarily related to these positive emotions. Third, I examined conscientiousness and positive emotions in a short longitudinal study to examine how conscientiousness and emotion work together to produce outcomes such as academic achievement.

CHAPTER 2

STUDY 1

The aim of Study 1 was to establish a meta-analytic relationship between conscientiousness and both general and specific positive affect, with particular attention to the emotions of pride and attentiveness. Consistent with previous research, I expected that conscientiousness would be positively related to overall positive affect, pride, and attentiveness, as well as to other specific positive emotions. Several of the samples used in this study consisted of primary data, and these data were used to investigate which specific emotions account for the relation between conscientiousness and positive affect. I predicted that pride or attentiveness would mediate the relation between conscientiousness and the experience of overall positive affect.

Method

Selection of emotions

Emotions to be included in the meta-analysis were selected using three strategies. First, pride and attentiveness were included based on theoretical justification and findings from previous research. Second, existing positive emotion scales that include measures of individual emotions were examined to ensure that the major positive emotions were included. These measures were the Positive and Negative Affect Schedule—Expanded Form (PANAS-X; Watson & Clark, 1999), which includes 22 individual positive emotion terms and 3 positive emotion subscales; the Differential Emotions Scale--IV (DES-IV; Izard, Blumberg, & Oyster, 1985), which includes interest and joy scales; the Multiple Affect Adjective Checklist (Zuckerman & Lubin, 1985), whose positive affect scale consists of happiness, joy, and pleasantness; the Intensity and Time Affect Scale (Diener, Smith, & Fujita, 1995), which includes love and joy; the

Mood Adjective Checklist (Nowlis & Green, 1957), which includes elation and vigor; and the Profile of Mood States (McNair, Lorr, & Droppleman (1971), which includes vigor (for a detailed list of positive emotions measures, see Larsen, Diener, & Lucas, 2003). Additionally, Berenbaum (2002) identified three key joy-related emotion factors associated with taking part in pleasurable activities: cheerfulness, contentment, and enchantment. Third, I examined definitions of basic emotions, and several emotion researchers note joy or happiness, interest, love, and wonder as being core basic emotions (Ortony & Turner, 1990).

Literature search

I conducted a literature search using the terms “conscientiousness,” “personality,” “big five,” “five factor model,” “positive affect,” “emotion,” “pride,” and “attentiveness,” and a citation search using the positive emotion measures mentioned in the previous section, as well as the names of widely used personality measures such as “BFI,” “NEO,” and “IPIP.” However, since little empirical research has been published on conscientiousness and narrower aspects of positive affect, most of the data in the meta-analysis came from unpublished datasets. These data were obtained by contacting researchers who regularly study these variables and/or who have published articles examining the big five personality traits and broader measures of positive affect. I also requested data via the Association for Research in Personality and Society for Personality and Social Psychology's e-mail listserves. Data from specific scales were targeted; namely, the PANAS-X (Watson & Clark, 1999) for its measure of attentiveness and the Authentic and Hubristic Pride Scale (Tracy & Robins, 2007b) for a more thorough measure of pride.

Correlations with conscientiousness were not available for some emotions and some emotion scales¹.

Criteria for inclusion

Since the goal of the current study was to examine the relationship between conscientiousness and specific emotions, only studies that measured specific positive emotions (e.g., pride, joy) were included in the meta-analysis. A few studies also contained measures of broad positive affect, and these data were included in the analyses in order to examine how the current estimates compare to results of previous studies. However, since a previous meta-analysis examined the relation between conscientiousness and positive affect (DeNeve & Cooper, 1998), studies containing positive affect but not specific emotions were not included in the current meta-analysis. No restrictions were made regarding sample characteristics such as age, ethnicity, gender, or clinical/non-clinical.

Meta-analytic analysis

Correlations between conscientiousness and affect were used as the measures of effect size. I used a random effects model to estimate population effect sizes. When the data were found to be homogenous, as indicated by a non-significant Q statistic, I instead analyzed those data based on a fixed effects model (Hedges & Olkin, 1985; Roberts, Kuncel, Viechtbauer, & Bogg, 2007). All estimates were calculated in the Comprehensive Meta Analysis program (Borenstein & Rothstein, 1999).

Specifically, I examined 12 separate positive emotional constructs: authentic pride, hubristic pride, attentiveness, interest, inspiration, contentment, cheerfulness, vigor, excitement,

¹ There were not enough data to calculate meta-analytic estimates for enchantment and contentment. In the current data, one sample reported the correlation between conscientiousness and enchantment ($r = -.04$) and three samples reported the relation between conscientiousness and contentment (average $r = .33$, ranging from .13 to .46).

love, wonder, and overall positive affect. Effect sizes for authentic pride were taken from data using the authentic pride scale of the AHPS and from the single item, “proud,” from the PANAS and PANAS-X. Hubristic pride was measured by the hubristic pride scale of the AHPS. Correlations for attentiveness used the PANAS-X attentiveness scale (“alert,” “attentive,” “determined,” “concentrating”). There were no published data for interest and conscientiousness, so effect sizes for interest were calculated using the correlation between conscientiousness and the item, “interested,” from the PANAS and PANAS-X. There were also no published data for conscientiousness and love, so effect sizes for love were computed using the correlation between conscientiousness and the item “in love.”² Wonder was comprised of descriptors such as “in awe” and “wonder.” Inspiration was assessed using measures of interest from published studies as well as the item “inspired” from the PANAS and PANAS-X. Contentment used published correlations between conscientiousness and contentment scales—no unpublished data were available for this emotion.

The 10-item joviality subscale of the PANAS-X includes the items “happy,” “cheerful,” “delighted,” “joyful,” “excited,” “enthusiastic,” “lively,” and “energetic,” and represents a mix of three qualitatively different emotions. For example, Berenbaum, Chow, Schoenleber, and (under review) found that vigor was empirically distinct from measures of happiness or cheerfulness. For this reason, data using the joviality scale as a whole were not included in the meta-analysis. Several samples of unpublished data contained the emotions included in the joviality scale, and these emotions were broken down into specific emotion scales: cheerfulness, a composite of the items “happy,” “cheerful,” “delighted,” and “joyful” (this configuration was also used by Watson (2000) and Feldman Barrett (1998); vigor, a combination

² “In love” may be a component of the broader emotion of affection; however, there were no data available on conscientiousness and affection.

of “lively” and “energetic”; and excitement, a composite of the items “excited” and “enthusiastic.” Published data including scales for happiness or joy were analyzed under “cheerfulness.” Finally, correlations with overall positive affect from studies that included one or more of the variables listed above were also included for analysis.

Overall, 50 studies were included in the meta-analysis, with $N = 52,261$ total participants. There were 253 effect sizes, with 64 for pride, 16 for attentiveness, 30 for excitement, 31 for inspiration, 30 for interest, 16 for cheerfulness, 11 for vigor, 11 for love, 12 for wonder, and 32 for positive affect. Of these, 19 effect sizes came from published studies; the rest were from unpublished data. See Table 1 for a description of the samples included in meta-analytic analyses.

Mediation analysis

Five of the samples included in the meta-analysis were unpublished data sets that contained both the Authentic and Hubristic Pride Scale (AHPS; Tracy & Robins, 2007b) and general positive affect as measured by the PANAS or PANAS-X. These data were used to test whether pride mediated the relation between conscientiousness and positive affect. Sample sizes ranged from $N = 1,184$ to $N = 2,100$, with a total of $N = 7,675$. In these samples, participants ranged in age from 17-51 ($M = 19.49$, $SD = 1.96$), with 65.9% females, 32.9% males, and 1.2% who did not report their gender. Overall race/ethnic makeup was 1.4% African American, 41.6% Asian, 33.4% Caucasian, 9.1% Hispanic, 7.2% mixed race, 5.7% “other,” and 1.6% did not record their race.

Additionally, 11 samples contained the full PANAS-X. These data were used to test whether attentiveness or any of the other specific emotions included in the meta-analysis mediated the relation between conscientiousness and positive affect. Sample sizes ranged from N

=274-1,999. Participants ranged in age from 17-59 ($M = 19.67$, $SD = 2.16$), with 66.5% female and 35.5% male. Race/ethnic makeup in these samples was 1.6% African American, 40.9% Asian, 36.2% Caucasian, 7.7% Hispanic, 7.5% mixed race, and 6.1% “other.”

Finally 19 samples contained the original 20-item PANAS (Watson, Clark, & Tellegen, 1988), and these datasets contained additional data on pride, excitement, interest, and inspiration. These samples ranged from $N = 135$ to $N = 2,333$, with participants ages 17 - 54 ($M = 19.57$, $SD = 2.06$); 65.5% female and 33.6% male, and .9% who did not report a gender; and 1.6% African American, 42.0% Asian, 33.3% Caucasian, 8.1% Hispanic, 7.5% mixed race, 6.1% other, and 1.4% who did not provide information on race.

Results

Meta-analysis

As expected, conscientiousness was significantly related to overall positive affect, as well as to each of the specific emotions included in the meta-analysis, with the exception of wonder ($\rho = -.01$, *ns*; see Table 2). The sample-weighted correlation between conscientiousness and overall positive affect was $\rho = .42$, and the median correlation between conscientiousness and each of the specific emotions was $\rho = .22$. I expected conscientiousness to be significantly positively related to attentiveness; however, the population estimate for attentiveness was quite large ($\rho = .52$, $p < .05$). Contrary to expectations, the population correlation for pride was approximately the same magnitude as the other specific emotions ($\rho = .27$, $p < .05$). However, when pride was broken down into three components—authentic pride, hubristic pride, and single-item measures that did not differentiate between authentic and hubristic pride—results were markedly different. All three categories of pride were significantly related to

conscientiousness, but authentic pride was related to conscientiousness to a much stronger degree than the other types of pride ($\rho = .44, p < .05$). Single-item pride was moderately related to conscientiousness ($\rho = .20$), and in line with previous research, hubristic pride was negatively related to conscientiousness ($\rho = -.21$).

Mediation

Next, I tested whether any specific emotions accounted for the relation between conscientiousness and positive affect. Mediation analyses were conducted on the 35 sets of primary data included in the meta-analysis that contained measures of conscientiousness and general positive affect. Table 3 contains correlations for each specific emotion and positive affect, each specific emotion and conscientiousness, zero-order and partial correlations for conscientiousness and positive affect, and the bootstrap indirect effect for each set of mediation tests. No mediation tests were conducted for wonder, since conscientiousness was not significantly related to wonder in any of the samples.

Five samples of unpublished data contained both the AHPS and the PANAS-X positive affect scale. To examine whether pride mediated the relation between conscientiousness and overall positive affect, it was necessary to create a positive affect variable that did not contain items from the PANAS-X pride scale. Thus, a measure of “positive affect without pride” was created using the nine items, “active,” “alert,” “attentive,” “determined,” “enthusiastic,” “excited,” “inspired,” “interested,” and “strong,” excluding the item, “proud.” Average reliability for this scale was $\alpha = .86$. In each of the five samples, conscientiousness was significantly related to positive affect without pride (r s from .41-.48, all $p < .05$). When controlling for authentic pride, the relation between conscientiousness and positive affect without

pride dropped to an average partial correlation of $r = .24$, ranging from $.20$ to $.27$ (all $p < .05$). I used an SPSS macro by Preacher and Hayes (2004) to calculate the strength of the indirect effect of conscientiousness on positive affect without pride through authentic pride. Using 1,000 bootstrap resamples in each analysis, all five samples showed a significant indirect effect (β s ranged from $.22$ -. $.24$, all $p < .05$). While authentic pride accounted for a significant portion of the association between conscientiousness and positive affect without pride, the effect only represented partial mediation.

Additionally, the PANAS and PANAS -X contain a 1-item measure of pride—the adjective “proud”; separate mediation tests were performed using the 25 samples containing these data. In these samples, average reliability for positive affect without pride was $\alpha = .85$, and conscientiousness was correlated with positive affect without pride at an average of $r = .42$ (all $p < .05$). When controlling for the item, “proud,” this relationship dropped to an average partial correlation of $r = .37$, and each partial correlation remained significant. In all cases, the indirect effect was significant (average $\beta = .10$, all $p < .05$). However, the pride item accounted for a smaller proportion of the relationship between conscientiousness and positive affect than authentic pride.

Next, I tested whether attentiveness mediated the conscientiousness-positive affect relationship. Similar to the analyses for pride, a “positive affect without attentiveness” variable was calculated, using the original PANAS-X positive affect scale with the exclusion of the items, “alert,” “attentive,” “concentrating,” and “determined.” Average reliability for this measure $\alpha = .82$. Across the 11 samples, conscientiousness was related to positive affect without attentiveness with an average correlation of $r = .32$ (all $p < .05$). When controlling for attentiveness, the partial correlation between conscientiousness and positive affect without

attentiveness dropped to an average correlation of $r = -.02$ (all *ns*). The indirect effect was significant in all samples (average $\beta = .36$, all $p < .05$). Thus, in these samples, attentiveness fully accounted for the relation between conscientiousness and positive affect.

In order to rule out the possibility that any other emotions mediated the conscientiousness-positive affect relationship, I tested for mediation using the other emotions included in the primary data—cheerfulness, vigor, love, excitement, interest, and inspiration. The eleven datasets used in testing attentiveness as a mediator were also used for cheerfulness, vigor, and love. Since love and the items in the cheerfulness scale (happy, delighted, joyful, cheerful) and vigor scale (lively, energetic) are not included in the PANAS-X positive affect scale, no special measures of positive affect were created for analyses involving cheerfulness, vigor, or love. Reliability for positive affect in these 11 samples was $\alpha = .85$, and conscientiousness was related to positive affect at an average of $r = .41$. When controlling for cheerfulness, the partial correlation between conscientiousness and positive affect was an average of $r = .37$, and each partial correlation remained significant. All indirect effects were significant (average $\beta = .14$). Similar results were obtained for vigor. When controlling for vigor, the correlation between conscientiousness and positive affect was reduced to an average of $r = .36$ (all $p < .05$). As with cheerfulness, the indirect effect was significant in all 11 samples (average $\beta = .15$). Although both cheerfulness and vigor significantly partially mediated the relation between conscientiousness and positive affect, in both cases, the effect was weak in comparison to attentiveness. Finally, the average partial correlation between conscientiousness and positive affect when controlling for love was $r = .40$ (all $p < .05$). The indirect effect averaged $\beta = .02$ and was not significant in five of the 11 samples. Love poorly explained the

relationship between conscientiousness and positive affect, as the partial correlation was effectively unchanged from the zero-order correlation.

Next, I tested excitement, interest, and inspiration as mediators of conscientiousness and positive affect. Thirty samples contained data on these emotions; 11 of these contained the PANAS-X and were also used in testing attentiveness, cheerfulness, and vigor. The remaining 19 datasets contained only the original 20-item PANAS. As in the previous tests, I created measures of “positive affect without excitement,” “positive affect without interest,” and “positive affect without inspiration,” excluding the terms “excited” and “enthusiastic,” “interested,” and “inspired” from the PANAS and PANAS-X positive affect scales, respectively. Reliability for these scales ranged from $\alpha = .83$ to $.85$ across all 30 samples.

In the 11 samples containing the PANAS-X, conscientiousness was significantly correlated with positive affect without excitement (average $r = .45$, all $p < .05$). When controlling for excitement, the partial correlation between conscientiousness and positive affect without excitement only dropped to an average of $r = .44$ (all $p < .05$). The indirect effect was significant in 11 samples (average $\beta = .10$). Results for data containing the PANAS were comparable; however one sample was omitted from mediation testing, as conscientiousness was not related to excitement in this sample ($r = -.02$, *ns*). In the remaining 18 samples, conscientiousness was related to positive affect without excitement at an average of $r = .46$ (all $p < .05$), and when controlling for excitement, this relation was only reduced to $r = .43$ (all $p < .05$). The indirect effect was significant in each of the 18 samples (average $\beta = .13$). In both sets of analyses, excitement did not explain much of the relationship between conscientiousness and positive affect.

In both the 11 samples containing the PANAS-X and the 19 samples containing the PANAS, conscientiousness was related to positive affect without interest at an average of $r = .42$ (all $p < .05$). When controlling for interest, this relation dropped to an average of $r = .37$ in the PANAS-X samples and $r = .38$ in the PANAS-only samples (all $p < .05$). Finally, in the first and second sets of samples, conscientiousness was related to positive affect without inspiration at $r = .42$ and $r = .43$, respectively (all $p < .05$). When controlling for inspiration, this relation dropped to an average of $r = .37$ and $r = .36$, respectively, and all correlations remained significant.

Discussion

As predicted, conscientiousness was significantly positively related to overall positive affect, but to a much stronger degree than that found in a previous meta-analysis (DeNeve & Cooper, 1998). This difference in strength is most likely due to better and more precise measurement of conscientiousness and affect in the current study. Also according to expectations, conscientiousness was significantly positively related to all but two of the specific positive emotions included in the meta-analysis; wonder showed no relationship with conscientiousness, and according to hypotheses, hubristic pride was negatively related to conscientiousness. Attentiveness was the emotion most strongly related to conscientiousness, followed closely by authentic pride.

I also examined which specific emotions underlay the relationship between conscientiousness and positive affect. Mediation analyses revealed that attentiveness fully accounted for conscientious individuals' experience of positive affect. Contrary to hypotheses, authentic pride partially, but not fully, accounted for this relationship. Authentic pride

accounted for a larger proportion of the relation between conscientiousness and positive affect than the single item, “proud.” This is most likely because “proud” is non-specific and could be interpreted to mean a number of things. For instance, “proud” could mean that one is proud of one’s accomplishments, or that he or she is haughty. In each of these samples, “proud” was significantly correlated with both authentic and hubristic pride (*r*s ranged from .48 to .52 for authentic pride and .07 to .17 for hubristic pride, all $p < .05$). Taken together with the meta-analytic results, this highlights the necessity of using precise measurement tools for emotions like pride that have been found to have two distinct facets (Tracy & Robins, 2007b). Finally, other emotions in the meta-analysis did not explain the relation between conscientiousness and positive affect. From these data, it appears that attentiveness is the primary emotion associated with conscientiousness. Although authentic pride did not explain the relationship between conscientiousness and positive affect, it nonetheless remained strongly related to conscientiousness.

CHAPTER 3

STUDY 2

Study 1 provided information about the relation between conscientiousness and several specific positive emotions. However, Study 1 was limited in that it only contained broad measures of conscientiousness. Conscientiousness is a family of traits comprised of attributes such as orderliness, responsibility, industriousness, impulse control, and conventionality (Roberts et al., 2005). Due to the variety of traits encompassed by broad measures of conscientiousness, it is possible that the individual facets of conscientiousness are differentially related to positive emotions. For example, two facets of conscientiousness—orderliness and traditionality—have been found to be unrelated to the experience of negative affect (Fayard et al., 2012). Therefore, it was important to assess the association between positive affect with a more differentiated model of conscientiousness. Study 2 improved upon Study 1 by assessing conscientiousness using two facet-level measures. Using these data, I was able to formally test whether any facets of conscientiousness uniquely predicted positive affect above and beyond a general conscientiousness factor. Additionally, Study 2 used both trait and state measures of positive affect, attentiveness, and pride. Based on the idea that conscientious individuals feel positive affect as a result of their accomplishments and productive behavior, I predicted that the facets of industriousness and responsibility would be most strongly related to general positive affect, pride, and attentiveness.

Another goal of Study 2 was to shed more light on the relationship between conscientiousness and attentiveness reported in Study 1. The strong population correlations found in Study 1 introduced the possibility that attentiveness items were tapping into measures of

industriousness. To investigate this possibility, Study 2 examined the relation between conscientiousness and attentiveness at the attentiveness item-level. These data allowed me to test which, if any, individual attentiveness items were driving the relationship with conscientiousness. I predicted that items such as “determined” would be most strongly related to conscientiousness, and that the relation between industriousness and attentiveness would be due to measurement overlap.

Further, Study 2 measured the full Big Five in order to test the “artifact hypothesis” that the relation between conscientiousness and positive affect is due to overlap with extraversion and neuroticism. The Big Five are not completely orthogonal, and conscientiousness shares some properties with the highly affect-laden extraversion and neuroticism. I predicted that even when controlling for the influence of extraversion and neuroticism, conscientiousness would remain a significant predictor of positive affect.

Method

Participants

315 participants were recruited via Amazon.com's Mechanical Turk program, an Internet survey engine, and received monetary compensation (\$0.50) for their participation. There were no restrictions as to participants' demographic characteristics, other than that the participants were required to reside in the United States. 37 participants were excluded from the study after failing to pass quality control items such as “Click ‘disagree’ if you are not a robot.” An additional 4 participants were excluded due to reporting that they were not fluent in English. The final group of 274 participants consisted of 179 females and 95 males, ages 18-73 ($M = 36.11$, $SD = 13.06$). The sample was 3.6% Asian, 6.9% Black, 81.8% Caucasian, 3.6%

Hispanic, 1.5% Native American, 2.2% bi- or multi-racial. One participant (.4%) did not report a race.

Materials

Personality traits. The Big Five Inventory (BFI) is a 44-item scale designed to measure the big five personality traits of extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience, with 8-10 items per trait domain. For example, participants were instructed to judge whether “[They] see [themselves] as someone who...” “does a thorough job” (conscientiousness) and “can be moody” (neuroticism). Participants indicated how much each item described them on a 1 (disagree strongly) to 5 (agree strongly) scale. Reliabilities for conscientiousness, extraversion, and neuroticism were $\alpha = .87, .89, \text{ and } .91$, respectively.

Conscientiousness was assessed by the Chernyshenko Conscientiousness Scales (CCS; Chernyshenko, 2003), the Big Five Inventory (John & Srivastava, 1999), and the conscientiousness scale from McCann, Duckworth, and Roberts (2009).

The CCS contains five 10-item subscales measuring facets of conscientiousness (order, industriousness, responsibility, self-control, and traditionality). Participants responded to statements such as “I rarely jump into something without first thinking about it” and “I invest little effort into my work” (reversed) on a scale from 1 (disagree strongly) to 4 (agree strongly). High scores indicate high levels of each facet. Reliability for overall conscientiousness was $\alpha = .94$, and reliabilities for individual facets were as follows: order ($\alpha = .92$), industriousness ($\alpha = .87$), responsibility ($\alpha = .76$), self-control ($\alpha = .82$), traditionality ($\alpha = .84$).

The conscientiousness scale from MacCann, et al. (2009) consists of 68 items taken from the International Personality Item Pool (Goldberg, Johnson, Eber, Hogan, Ashton, Cloninger, & Gough, 2006) that measure 8 facets of conscientiousness: industriousness (10 items),

perfectionism (9 items), tidiness (9 items), procrastination refrainment (7 items), control (8 items), caution (7 items), task planning (9 items), and perseverance (9 items). Participants indicated the extent to which items such as, “I accomplish a lot of work” (industriousness) and “I am easily discouraged” (perseverance, reversed) were true for them on a scale from 1 (not at all like me) to 5 (very much like me). High scores represent higher levels of conscientiousness. Reliability for the overall conscientiousness scale was $\alpha = .96$, and reliabilities for the facet scales were industriousness ($\alpha = .90$), perfectionism ($\alpha = .83$), tidiness ($\alpha = .90$), procrastination refrainment ($\alpha = .86$), control ($\alpha = .86$), caution ($\alpha = .85$), task planning ($\alpha = .90$), and perseverance ($\alpha = .85$).

Positive affect. Positive affect was measured using the 22 positive affect items from the Positive and Negative Affect Schedule – Expanded Form (PANAS-X; Watson & Clark, 1999). The PANAS-X is a checklist measure of affect that asks participants to rate the extent to which they experience each emotion on a scale from 1 (very slightly or not at all) to 5 (extremely). In the current study, participants first rated the extent to which they experience each emotion on average (trait positive affect), followed by how they felt at the current moment (state positive affect). The overall positive affect scale contains 10 affect terms: active, alert, attentive, determined, enthusiastic, excited, inspired, interested, proud, and strong. The PANAS-X also includes three specific positive emotion scales: joviality (happy, joyful, delighted, cheerful, excited, enthusiastic, lively, energetic), self-assurance (proud, strong, confident, bold, daring, fearless), and attentiveness (alert, attentive, concentrating, determined). Positive affect and attentiveness were the only scales reported in the current study. Reliabilities for trait and state positive affect were both $\alpha = .92$, and reliabilities for trait and state attentiveness were $\alpha = .85$ and $.89$, respectively.

Pride was assessed using the Authentic and Hubristic Pride Scale (AHPS; Tracy & Robins, 2007b). The AHPS is an adjective measure of pride containing 14 items that make up two 7-item subscales, authentic pride and hubristic pride. The authentic pride subscale consists of descriptors such as “confident,” “productive,” and “accomplished.” Participants rated the extent to which they experience these emotions generally or typically (trait) or at the current moment (state) on a scale ranging from 1 (not at all) to 5 (extremely). Participants completed both trait and state versions of the AHPS. Reliabilities for trait and state authentic pride were $\alpha = .94$ and $.93$, respectively.

Results

Positive affect

Similar to findings from Study 1, BFI conscientiousness was related to overall trait positive affect ($r = .50$) and state positive affect ($r = .48$). CCS conscientiousness was significantly related to both trait and state overall positive affect (both $r_s = .46$, both $p < .05$). All five facets of CCS conscientiousness were also significantly related to positive affect: industriousness and responsibility were most strongly related to overall positive affect ($r_s = .48$ and $.43$ for trait positive affect, and $r_s = .43$ and $.38$ for state positive affect), while order ($r_s = .30$ and $.32$), self-control ($r_s = .25$ and $.27$), and traditionality ($r_s = .27$ and $.31$) were significantly, but less strongly, correlated with trait and state positive affect. Correlations between conscientiousness and positive affect, attentiveness, and pride can be viewed in Table 4.

Overall conscientiousness from the MacCann scale was significantly related to both trait and state positive affect ($r_s = .53$ and $.52$, respectively). All eight facets of conscientiousness from the MacCann scale were significantly related to positive affect. Similar to results from the CCS, industriousness was highly correlated with overall positive affect ($r = .53$ for trait positive

affect, $r = .47$ for state positive affect, both $p < .05$), whereas tidiness and control were significantly, but less strongly, related to positive affect (see Table 4). The remaining facets in the MacCann scales do not have a direct counterpart in the CCS. However, a few facets from the CCS and MacCann scales were correlated at levels approaching scale reliabilities (see Table 5). MacCann perseverance was related to CCS responsibility at $r = .69$ and to CCS industriousness at $r = .62$, and MacCann perfectionism and CCS industriousness were correlated at $r = .68$. Not surprisingly, perseverance and perfectionism were related to trait and state positive affect at levels comparable to those from CCS industriousness and responsibility ($r_s = .52$ and $.47$ for perseverance and both $r_s = .40$ for perfectionism). Two facets unique to the MacCann scale were also strongly correlated with positive affect—procrastination refrainment and task planning (r_s ranged from $.45$ -. 47). Finally, trait and state positive affect were correlated at $r = .83$ ($p < .05$).

Attentiveness

BFI conscientiousness was significantly correlated with both trait attentiveness and state attentiveness ($r_s = .60$ and $.45$, respectively; both $p < .05$). CCS conscientiousness was significantly related to trait attentiveness ($r = .56$, $p < .05$) and state attentiveness ($r = .43$, $p < .05$). Further, all five facets of CCS conscientiousness were significantly related to overall attentiveness. Similar to the results for positive affect, two facets of conscientiousness were related to trait and state attentiveness much more strongly than the others: industriousness ($r_s = .57$ and $.45$, respectively; $p < .05$) and responsibility ($r_s = .52$ and $.42$, respectively; $p < .05$). The remaining three facets of CCS conscientiousness were related to trait attentiveness at an average of $r = .34$ (all $p < .05$) and to state attentiveness at an average of $r = .26$ (all $p < .05$).

Overall MacCann conscientiousness was significantly correlated with both trait and state attentiveness ($r_s = .62$ and $.48$, both $p < .05$), and all 8 facets were significantly correlated with both forms of attentiveness. As with overall positive affect, industriousness and perseverance were the facets most strongly associated with trait attentiveness (both $r = .61$) and state attentiveness ($r_s = .47$ and $.45$, respectively). Tidiness was significantly related to attentiveness, but was the most weakly related ($r_s = .30$ and $.20$ for trait and state attentiveness). Additionally, trait and state attentiveness were significantly correlated ($r = .78$, $p < .05$).

In order to further explore the relation between conscientiousness and attentiveness, I examined attentiveness at the item level. I predicted that items such as “determined” would be more strongly correlated with conscientiousness than items such as “alert” and “attentive.” Correlations for overall conscientiousness and its facets with the individual items from the PANAS-X attentiveness scale can be found in Table 6. BFI conscientiousness, overall CCS conscientiousness, and overall conscientiousness from the MacCann scale were related to each item in the attentiveness scale (“attentive,” “alert,” “determined,” and “concentrating”) for both trait and state attentiveness (see Table 6). First, I examined correlations between the five CCS conscientiousness facets and the four attentiveness items. There were no major differences in the strength of the associations between conscientiousness facets and each attentiveness item. Averaging across conscientiousness facets, correlations for trait attentiveness items ranged from an average of $r = .33$ (“alert”) to $r = .37$ (“attentive” and “concentrating”), and average correlations for state attentiveness items ranged from $r = .27$ (“attentive” and “concentrating”) to $r = .33$ (“determined”). Results were similar for the MacCann conscientiousness scale. conscientiousness facets, conscientiousness was related to each attentiveness item approximately equally, with average correlations for each item ranging from $r = .38$ (“alert”) to $r = .41$

(“attentive” and “concentrating”), and from $r = .30$ (“attentive,” “alert,” and “concentrating”) to $r = .36$ (“determined”).³ From these results, it appears that the relation between attentiveness and attentiveness is not driven by any particular attentiveness items⁴.

Authentic pride

BFI conscientiousness was significantly related to both trait and state pride ($r_s = .57$ and $.56$, respectively), as was overall CCS conscientiousness ($r_s = .51$ and $.50$) and overall MacCann conscientiousness ($r_s = .62$ and $.61$). At the CCS facet level, results were comparable to those for general positive affect and attentiveness (see Table 4). Industriousness and responsibility were the facets most strongly related to pride ($r_s = .52$ and $.48$ for trait pride; $r_s = .47$ and $.49$ for state pride, all $p < .05$). For MacCann conscientiousness, all 8 facets were significantly related to pride, but industriousness and perseverance were strongest (correlations ranged from $r = .56$ to $r = .64$). As with positive affect and attentiveness, trait and state authentic pride were strongly correlated ($r = .87, p < .05$).

Testing measurement overlap

Before attempting to replicate the finding from Study 1 that attentiveness mediates the relationship between conscientiousness and overall positive affect, it was necessary to first test whether attentiveness and industriousness are part of the same construct. Currently, industriousness and attentiveness are treated as two constructs in the literature; industriousness as a facet of conscientiousness, and attentiveness as an emotion. However, the high correlations

³ As a comparison, the average item-total correlation for CCS conscientiousness items was $r = .47$, and $r = .52$ for MacCann conscientiousness items.

⁴ Similarly, conscientiousness and its facets were approximately equally related to each individual item in the authentic pride scale, as well as to each item in the PANAS positive affect, joviality, and self-assurance scales, with the exception of the self-assurance scale item “daring,” which was consistently either negatively related to or not significantly related to facets of conscientiousness.

between attentiveness items and measures of industriousness may indicate that items such as “alert,” “attentive,” “determined,” and “concentrating” are actually measuring industriousness. If it is indeed the case that attentiveness is tapping into conscientiousness, the association between attentiveness and industriousness is simply an artifact, and attentiveness should not be treated as an affective state.

To test the possibility of measurement overlap between industriousness and attentiveness, I tested two latent variable models using AMOS software (Arbuckle, 2009)—one in which industriousness and attentiveness are separate constructs and one in which the two are represented by a single latent construct. Fit for both models was assessed using two statistics: the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). In general, a CFI above .95 indicates a good fitting model (Bentler, 1990). Additionally RMSEA values of less than .05 are considered to indicate a good model fit.

First, I tested the currently accepted model, with CCS industriousness and trait attentiveness treated as separate, but correlated constructs (see Figure 1). I created two correlated latent variables for attentiveness and industriousness, with the four attentiveness items as indicators for attentiveness and the 10 industriousness items as indicators for industriousness. Fit statistics indicated that this model fit the data moderately well (CFI = .92, RMSEA = .08). I tested this model using MacCann industriousness, and this model also fit the data well (CFI = .95, RMSEA = .07). Since MacCann perfectionism and perseverance were correlated with industriousness at $r = .68$ and $r = .62$, respectively, I also tested the traditional model using perfectionism and perseverance in place of industriousness. The two-factor model fit the data less well for perfection and perseverance (both CFI = .92, both RMSEA = .08). In these models, the two latent factors were correlated at an average of .62.

Next, I constructed a one-factor model to test whether CCS industriousness and attentiveness were better represented as a single construct. I created a single latent variable with the 4 attentiveness items and the 10 industriousness items as indicators. Fit statistics indicated that the one-factor model was a poor fit for the data (CFI = .78, RMSEA = .13). Fit was similar when using the 10 items from MacCann industriousness (CFI = .83, RMSEA = .13), the 9 items from MacCann perfectionism (CFI = .69, RMSEA = .15), and the 9 items from MacCann perseverance (CFI = .80, RMSEA = .13). Each of the traditional two-factor models were a better fit for the data than the one-factor model, and this conclusion was supported by each model's AIC statistics, in which a smaller AIC indicates a better model (Akaike, 1974). Across all facets of conscientiousness, AIC ranged from 258.53 to 292.64 for the two-factor models, and from 452.97 to 555.58 for the one-factor models. It appears that in the current sample, industriousness and attentiveness should not be thought of as the same construct.

Since authentic pride was related to industriousness and responsibility at approximately the same levels as attentiveness, I also tested whether measurement overlap existed between authentic pride and the facets of industriousness and responsibility. Overall, the two-factor models fit the data well. Fit for the two-factor model for CCS industriousness was CFI = .92, RMSEA = .08, and for MacCann industriousness, CFI = .93 and RMSEA = .09. Similarly, fit indices for MacCann perfectionism, MacCann perseverance, and CCS responsibility ranged from CFI = .91 to .93 and RMSEA = .07 to .09. In these models, correlations between the two latent factors ranged from .44 to .70.

As with attentiveness, the one-factor models for conscientiousness and pride fit the data more poorly than the two-factor models. Models for CCS and MacCann industriousness did fit well (CFI = .73 and .70, RMSEA = .15 and .17, respectively), nor did MacCann perfectionism

(CFI = .72, RMSEA = .16), MacCann perseverance, or CCS responsibility (both CFI = .80, RMSEA = .14 and .12, respectively). AIC results supported this conclusion (AICs for the two-factor models were 429.51 and 383.28 for CCS industriousness and responsibility, and 953.23 and 650.69 for the one-factor models; results were comparable for the models involving MacCann conscientiousness).

Mediation analyses

Since industriousness and attentiveness were found to be separate constructs, I next attempted to replicate results from Study 1 by testing whether attentiveness accounted for the relation between conscientiousness and overall positive affect. Following the procedure used in Study 1, I created a measure of positive affect without attentiveness by excluding the items “alert,” “attentive,” and “determined” from the trait version of the PANAS-X positive affect scale. Reliability for this scale was $\alpha = .91$. BFI conscientiousness was significantly related to positive affect without attentiveness ($r = .42$), but when controlling for trait attentiveness, this association was no longer significant ($r = -.02, ns$). Similarly, CCS conscientiousness was related to positive affect without attentiveness at $r = .39$, and when controlling for attentiveness, the partial correlation dropped to zero ($r = -.01, ns$). Finally, MacCann conscientiousness was related to positive affect without attentiveness ($r = .46$), and when controlling for trait attentiveness, this relationship was no longer significant ($r = .03, ns$). Next, I used the bootstrapping procedure by Preacher and Hayes (2004) to test whether attentiveness significantly accounted for the relation between conscientiousness and positive affect. In all three conscientiousness scales, the indirect effect through attentiveness was significant (β s = .72, .98, and .58 for BFI conscientiousness, CCS conscientiousness, and MacCann conscientiousness, respectively).

Next, I tested whether authentic pride mediated the relationship between conscientiousness and positive affect. Based on results from Study 1, I predicted that pride would account for less of this relationship than attentiveness. To test this hypothesis, I first created a measure of positive affect without pride by excluding the item “proud” from the PANAS-X trait positive affect scale. Reliability for this scale was $\alpha = .92$. BFI conscientiousness was significantly related to positive affect without pride ($r = .50, p < .05$). When controlling for trait authentic pride, the association between conscientiousness and positive affect without pride dropped to $r = .15 (p < .05)$. The same pattern of results was found for CCS and MacCann conscientiousness. CCS conscientiousness was significantly related to positive affect without pride ($r = .46, p < .05$), and when controlling for pride, the partial correlation between these variables was $r = .16 (p < .05)$. MacCann conscientiousness was also significantly related to positive affect without pride ($r = .53, p < .05$), and when controlling for authentic pride, the partial correlation was $r = .16 (p < .05)$. Using 5,000 bootstrap resamples, the indirect effect of conscientiousness on positive affect without pride for BFI conscientiousness was $\beta = .45$, the effect for CCS conscientiousness was $\beta = .75$, and for MacCann conscientiousness, $\beta = .59$; all $p < .05$. Thus, while pride was a significant partial mediator of the relation between both conscientiousness facets and positive affect, it did not fully explain this relationship. These findings replicate results from Study 1 that attentiveness fully accounts for the conscientiousness-positive affect relationship, whereas pride accounts for only a portion of this relationship.

General conscientiousness versus facets

Additionally, I used bi-factor modeling to formally examine whether any specific facets of conscientiousness contribute unique variance above and beyond the influence of a general

conscientiousness factor in predicting positive affect. Based on previous work (Fayard et al., 2012), I expected that general conscientiousness would account for the relation between conscientiousness and positive emotions rather than any particular facet or set of facets. To construct this model, I first created a latent trait model for a general conscientiousness factor that used the 50 CCS items as indicators. I then added five uncorrelated specific factors, one for each facet of conscientiousness, using the 10 items belonging to each facet as indicators. Next, predicted trait attentiveness and trait pride from both latent variables (see Figure 2). This procedure tested whether industriousness significantly predicted over and above the influence of general conscientiousness. While controlling for general conscientiousness, industriousness significantly predicted both trait attentiveness ($\beta = .22, p < .05$) and trait pride ($\beta = .20, p < .05$). I repeated these analyses for each remaining facet of CCS conscientiousness. No other facets of CCS conscientiousness significantly predicted attentiveness or pride beyond a general conscientiousness factor.

Artifact hypothesis

Next, I tested the “artifact hypothesis” that the relation between conscientiousness and positive affect results from conceptual overlap between conscientiousness and extraversion. To test whether conscientiousness provides any incremental validity above and beyond extraversion and neuroticism in predicting positive affect, I conducted a hierarchical regression analysis, controlling for BFI extraversion and neuroticism by entering these variables in the first step. BFI conscientiousness was entered in the second step, and measures of overall positive affect, attentiveness, and pride served as the outcome variable. Results confirmed the prediction that BFI conscientiousness would remain a significant predictor of positive affect, even while accounting for the influence of extraversion and neuroticism ($\beta = .26$ for trait positive affect, and

$\beta = .30$ for state affect; both $p < .05$). The effect held when considering specific positive emotions (β s = .45 and .34 for trait and state attentiveness, and β s = .32 and .33 for trait and state pride; all $p < .05$). In other words, the relation between conscientiousness and positive affect was not the result of an artifact; conscientiousness uniquely predicted general positive affect, as well as various specific positive feelings.

Discussion

Study 2 replicated the relationship between conscientiousness and overall positive affect, attentiveness, and authentic pride found in Study 1. However, Study 2 also measured conscientiousness at the facet level to examine whether certain parts of conscientiousness are more strongly related to positive affect than others. According to predictions, industriousness and CCS responsibility showed the strongest associations with positive affect. Additionally, the facet of perseverance from the MacCann conscientiousness scale, which appears to be a blend of industriousness and responsibility, showed strong associations with positive affect. I used a bifactor model to formally test whether any specific facets of conscientiousness uniquely predicted attentiveness and pride above and beyond a general conscientiousness factor. Industriousness was the only conscientiousness facet that showed incremental validity over general conscientiousness. From these results, it appears that the more proactive forms of conscientiousness are responsible for the relation between conscientiousness and positive affect.

I also tested the possibility that industriousness and attentiveness were similar enough to be considered one construct. First, I examined correlations between individual attentiveness items and conscientiousness and found that no specific attentiveness items were more strongly correlated with conscientiousness. Then I formally modeled the relationship between industriousness and attentiveness, comparing one-factor and two-factor models. In both facet-

level conscientiousness scales, the two-factor model was a better fit for the data. Since industriousness and attentiveness were not found to be part of the same construct, I attempted to replicate mediation analyses from Study 1 that showed that attentiveness fully accounts for the relationship between conscientiousness and positive affect. As in Study 1, trait attentiveness fully mediated the relation between conscientiousness and trait positive affect in all three conscientiousness scales. Finally, I tested whether the relationship between conscientiousness and positive affect is due to overlap between conscientiousness and extraversion and neuroticism. Across three conscientiousness scales, conscientiousness predicted positive affect, attentiveness, and pride while controlling for extraversion and neuroticism. Thus, conscientiousness appears to be genuinely related to positive affect above and beyond the influence of extraversion and neuroticism.

CHAPTER 4

STUDY 3

Studies 1 and 2 showed that attentiveness plays an important role in conscientious individuals' experience of positive affect. In both studies, authentic pride was also strongly related to conscientiousness, although it did not explain the conscientiousness-positive affect link. Study 3 aimed to provide context to the results of the previous studies by examining the process by which conscientiousness leads to positive affect through accomplishments, such as doing better on exams. In a brief longitudinal study, I examined the interplay between students' personality traits and their affective responses to their performance on two exams over the course of half a semester. Exam scores were chosen as the criterion for academic achievement in this study, as conscientiousness is reliably related to markers of academic performance such as GPA. A recent meta-analysis (Poropat, 2009) examined the relationship between conscientiousness and GPA. Conscientiousness was the strongest Big Five predictor of academic performance, and predicted GPA as well as cognitive ability. Additionally, conscientiousness remained a predictor of academic performance when controlling for cognitive ability.

In an analogous study, Fayard et al. (2012) examined the relation between conscientiousness, guilt, and exam scores. In this study, students who performed poorly on first exam experienced guilt as a result, and when controlling for trait levels of guilt, students' guilt about their exam performance predicted better performance on a subsequent exam. Guilt about students' exams also partially mediated the relation between scores on the first and second exams. Results from this study indicated that conscientiousness can influence affective experience, which in turn can influence future conscientious behavior in a few ways—through

trait levels of affect, as well as through affect experienced as a result of one's accomplishments and failures.

Study 3 aimed to test three sets of hypotheses. First, based on evidence from Studies 1 and 2, it was predicted that conscientiousness would be related to both trait attentiveness and trait pride. Second, theory on pride suggests that high levels of pride might give students confidence to undertake the pursuit of a new goal, such as trying to attain good grades. If this is the case, it would be expected that pride should mediate the relation between conscientiousness and exam performance. Given the strong relation between conscientiousness and attentiveness, I also tested whether attentiveness mediated the relation between conscientiousness and exam performance. Third, since authentic pride is said to result from achieving one's goals, I expected that conscientious students would experience higher levels of pride through achieving high exam scores. In other words, I expected conscientious students to experience greater levels of pride because of higher exam performance, and that exam performance would mediate the relation between conscientiousness and exam-related pride.

Method

Participants

Participants were undergraduate students at the University of Illinois enrolled in two psychology of personality courses, and they received partial course credit for completing each session of the study. Data were collected at two time points during each semester; 270 participants completed both sessions and were included in final analyses. Participants consisted of 66.9% female and 33.1% male students between ages 18 and 34 ($M = 20.24$, $SD = 1.87$) and were 3.4% African American, 4.9% Hispanic or Latino, 31.8% Asian, 54.2% Caucasian, .4% Pacific Islander, and 5.3% biracial or multiracial.

Measures

Personality traits. Conscientiousness was assessed using the CCS (Chernyshenko, 2003). The CCS is described in detail in Study 2. Reliability for conscientiousness was $\alpha = .89$; reliabilities for the individual facets ranged from $\alpha = .70$ for responsibility to $\alpha = .91$ for order and averaged $\alpha = .80$.

Conscientiousness, extraversion, and neuroticism were measured using the BFI (see Study 2). Reliabilities were $\alpha = .80$ for conscientiousness, $\alpha = .89$ for extraversion, and $\alpha = .86$ for neuroticism.

Pride. Pride was measured by the AHPS (Tracy & Robins, 2007b) and was administered in two forms; a trait version and an exam-specific version. As in Study 2, the trait version measured the extent to which participants experience pride generally or typically. The exam-specific version of this measure asked participants to rate each item with regard to how they felt about their performance on the most recent exam in the course. Reliabilities for trait authentic pride and exam-specific authentic pride were $\alpha = .86$ and $\alpha = .95$, respectively.

Positive affect. Positive affect was measured using the 22 positive affect items from the Positive and Negative Affect Schedule – Expanded Form (PANAS-X; Watson & Clark, 1999). This measure is described in Study 2. As in Study 2, participants rated the extent to which they experience each emotion on average (trait positive affect), as well as how they felt about their most recent exam score (exam-specific positive affect). Reliabilities for trait and exam-specific positive affect were $\alpha = .84$ and $\alpha = .88$, respectively, and reliabilities for trait and exam-specific attentiveness were $\alpha = .77$ and $\alpha = .79$, respectively.

Exams. Participants completed two midterm exams to fulfill their normal course requirements. Participants authorized access to their exam grades when they consented to participate in the study.

Procedure

At the beginning of the semester, students completed measures of trait conscientiousness and affect using the CCS, trait PANAS-X, and trait AHPS. After obtaining their grades on the first exam, students rated how they felt about their performance on the exam using the test-specific versions of the PANAS-X and AHPS. Students completed these assessments within 4 weeks of taking their first exam. Approximately 4 weeks after taking the first exam, the students took their second exam in the course. Students' exam grades were retrieved at the end of the semester, after official grades were reported to the University.

Results

Descriptive statistics

First, I examined the correlations among trait conscientiousness, trait and exam-specific positive emotions, and exam scores (see Table 8). Consistent with results from Studies 1 and 2, conscientiousness was significantly related to trait pride ($r = .36$), trait attentiveness ($r = .49$) and overall trait positive affect ($r = .35$). Contrary to predictions, overall conscientiousness was not significantly related to exam 1 scores ($r = .11$) or to exam 2 scores ($r = .08$). Industriousness and self-control were the only facets of conscientiousness related to exam 1 scores ($r_s = .15$ and $.12$, respectively; both $p < .05$)⁵. Only industriousness was related to exam 2 scores ($r = .22$, $p .05$). Trait pride and attentiveness were not related to performance on either exam (r_s ranged

⁵ Before rounding, the correlation between self-control and exam 1 scores was $r = .124$ ($p < .05$). A few other correlations in the present study were reported as $r = .12$. In these cases, the un-rounded correlations were $r = .120$ or lower and were not statistically significant.

from $-.05$ to $.08$, all *ns*), and overall positive affect was negatively related to exam 1 performance ($r = -.15, p < .05$). Due to this pattern of correlations, the hypothesis that trait pride should motivate higher scores on exam 1 was not supported.

As expected, exam 1 scores were significantly related to all exam-specific affect measures ($r = .55$ for pride, $r = .24$ for attentiveness, and $r = .39$ for positive affect; all $p < .05$), supporting the idea that accomplishments, such as academic achievement, promote experiencing positive emotions. Further, all exam-related affect variables were related to scores on exam 2 (r s ranged from $.14$ to $.21$, all $p < .05$). Exam-specific attentiveness was related to overall conscientiousness and industriousness (both $r = .16$), and exam-related pride and positive affect were related to overall conscientiousness (r s = $.13$ and $.14$) and traditionality (r s = $.14$ and $.16$). Finally, exams 1 and 2 were significantly correlated ($r = .60$).

Mediation and regression analyses

The patterns of correlations in these data precluded testing a few of the other proposed mediation effects. For example, overall conscientiousness was not significantly related to either set of exam scores, so industriousness was used in the subsequent analyses in place of general conscientiousness. Industriousness was significantly related to trait authentic pride ($r = .47$), but trait authentic pride was not related to exam 1 scores. Further, self-control, though related to exam scores, was unrelated to trait pride ($r = .10, ns$). Thus, the idea that trait pride motivates conscientious individuals to achieve high exam scores was not supported. Similarly, trait attentiveness did not predict exam 1 scores, and therefore could not mediate the relation between conscientiousness and exam performance.

Next, I tested the hypothesis that industriousness would be related to positive emotions through achievements on exams. Attentiveness was the only exam-related emotion correlated

with industriousness. Industriousness significantly predicted exam 1 scores ($\beta = .15, p < .05$), which, in turn, predicted feeling attentive ($\beta = .24, p < .05$). However, exam 1 scores only partially accounted for the relation between industriousness and exam attentiveness; the partial correlation remained significant when controlling for exam 1 scores (partial $r = .15, p < .05$). Bootstrapping analysis indicated a significant indirect effect ($\beta = .06, p < .05$). Self-control was not significantly related to exam-specific pride, attentiveness, or positive affect, so the idea that self-control was related to affect through exam scores was not supported.

I tested the motivational hypothesis of pride, or the idea that pride about students' performance on exam 1 would motivate better performance on exam 2, by examining whether exam-specific pride mediated the relation between scores on exams 1 and 2. Exam 1 scores predicted experiencing pride ($\beta = .55, p < .05$), and experiencing pride about exam 1 predicted higher exam 2 scores ($\beta = .21, p < .05$). Although the indirect effect was significant ($\beta = -.09, p < .05$), exam-specific pride accounted for very little of the relation between exam 1 scores and 2 scores (zero-order $r = .60, p < .05$; partial $r = .58, p < .05$). I was unable to test whether pride mediated the relation between conscientiousness and exam 2 performance since exam pride was not significantly related to conscientiousness or any facets of conscientiousness. Thus, the motivational function of pride was not supported.

While only pride about exam 1 was hypothesized to have a motivating effect on subsequent exams, it was possible that other positive emotions could promote better scores on exam 2. Thus, I also tested whether exam attentiveness and exam positive affect mediated the relation between scores on both exams. When controlling for attentiveness, the relation exam 1 scores and exam 2 scores was reduced from $r = .60$ to $r = .59$ (both $p < .05$). The indirect effect was not significant ($\beta = -.01$). Similarly, when controlling for overall positive

affect, the partial correlation was also $r = .59$ ($p < .05$), and the indirect effect was not significant ($\beta = -.04$, *ns*). Attentiveness also did not mediate the relation between industriousness and 2 scores (zero-order $r = .22$, partial $r = .20$, both $p < .05$; $\beta = .18$, *ns*).

Finally, I attempted to replicate results from Studies 1 and 2 showing that attentiveness fully mediates the relation between conscientiousness and positive affect. As in the previous studies, I calculated positive affect without attentiveness by excluding the four attentiveness items from the PANAS-X positive affect scale. Conscientiousness was correlated with positive affect without attentiveness at $r = .29$ ($p < .05$), and when controlling for attentiveness, this association was reduced to $r = .01$ (*ns*). As in Studies 1 and 2, the indirect effect was significant ($\beta = .60$, $p < .05$). I compared these results with pride. Conscientiousness was related to positive affect without pride at $r = .38$ ($p < .05$), and the partial correlation between these variables when controlling for pride was $r = .24$. The indirect effect was significant ($\beta = .35$, $p < .05$), but whereas attentiveness accounted for the entire relationship between conscientiousness and positive affect, pride accounted for a smaller proportion of this relationship.

Factor analysis

As in the previous studies, industriousness was strongly correlated with trait attentiveness ($r = .49$, $p < .05$). I attempted to replicate factor analytic results from Study 2 that showed industriousness and attentiveness were two separate factors. As in Study 2, I constructed two correlated latent factors: attentiveness, with its four items as indicators, and industriousness, with its 10 items as indicators. Fit for this model was good (CFI = .90, RMSEA = .08), and the two latent factors were correlated at $r = .69$. Next, I constructed a single-factor model depicting one latent combined industriousness/attentiveness factor with both the 10 industriousness items

and the four attentiveness items as indicators. The one-factor model did not fit as well as the two-factor model (CFI = .83, RMSEA = .11). A further comparison of the models using the indicated that the two-factor model was superior (AIC for the 2 factor model = 295.37, and AIC for the 1 factor model = 391.24). These results support the finding from Study 2 that although industriousness and attentiveness are highly correlated, they are best understood as separate constructs rather than as one factor.

Since industriousness and trait authentic pride were also highly correlated, I conducted the same test comparing one- and two-factor models of industriousness and authentic pride. In the two-factor model, the latent factors were correlated at $r = .56$. The two-factor model fit the data well (CFI = .86, RMSEA = .09, AIC = 454.17) compared to the one-factor model (CFI = .70, RMSEA = .12, AIC = 710.64). Similar to attentiveness, authentic pride and industriousness function as separate constructs.

Artifact hypothesis

In an attempt to replicate results from Study 2, I tested whether conscientiousness predicted positive affect above and beyond extraversion and neuroticism. As in Study 2, I created a hierarchical regression equation, entering extraversion and neuroticism as predictors in the first step, conscientiousness as a predictor in the next step, and trait positive affect as the dependent variable. BFI conscientiousness remained a significant predictor of positive affect while controlling for extraversion and neuroticism ($\beta = .35$, $p < .05$). I conducted the same analysis using authentic pride and attentiveness as outcome variables, and conscientiousness remained a significant predictor of these emotions as well (β s = .40 and .53, respectively; both $p < .05$).

Discussion

Study 3 added to the findings of Studies 1 and 2 by examining the process by which conscientiousness is related to positive affect. Over the course of half a semester, I measured students' levels of conscientiousness and trait emotions, and later, their feelings about how they performed on exams in a college course. Thus, I used combined broad and specific levels of analysis to get a more detailed view of how conscientious individuals come to experience positive affect. Study 3 replicated results from Studies 1 and 2 that found sizeable, significant correlations between conscientiousness and trait levels of the positive emotions of attentiveness and pride. As in Studies 1 and 2, attentiveness mediated the relation between conscientiousness and positive affect, whereas pride only partially accounted for this association.

I hypothesized that being conscientious would allow students to score highly on exams, and scoring highly on exams would promote experiencing positive affect. In other words, conscientiousness would be related to affect through accomplishments. This hypothesis was partially supported. General conscientiousness was not related to scores on exam 1 or exam 2; rather, the facets of industriousness and self-control predicted scores on exam 1. These findings are consistent with results from previous studies that reported self-control, diligence, and achievement-striving as the most important facets of conscientiousness in predicting both high school and college GPA (Nofle & Robins, 2007). Higher scores on exam 1 then predicted experiencing heightened pride, attentiveness, and overall positive affect. However, achievements (exam 1 scores) did not mediate the relation between industriousness and attentiveness. Thus, conscientious individuals scored more highly on exams and felt positive affect as a result, but the emotions they experienced were not necessarily dependent on their levels of conscientiousness.

Another hypothesis proposed that experiencing positive affect about one's exam should lead to better performance on the next exam. Results ran contrary to the popular lay belief that engendering positive feelings about one's self or about one's performance leads to improved performance. While exam-related pride, attentiveness, and overall positive affect positively predicted performance on exam 2, none of these emotions mediated the relation between scores on exams 1 and 2. Further, attentiveness did not explain why conscientious individuals scored highly on exam 2. Similarly, in terms of trait affect, positive affect was actually a negative predictor of exam 1 scores. In this study, the title of a recent article by Roy Baumeister rings true: "Rethinking self-esteem: Why nonprofits should stop pushing self-esteem and start endorsing self-control" (2005). It appears that rather than going through affective channels, self-control and industriousness directly influence exam performance.

I also specifically tested the motivational hypothesis of pride (e.g., Williams & DeSteno, 2008). Based on this work, I predicted that experiencing pride, as opposed to other positive emotions, about a specific accomplishment such as scoring highly on exams would serve as a motivating force for students to improve their performance on a related achievement—the second exam. While pride about exam 1 did predict scores on exam 2, this effect did not hold when taking exam 1 scores into account. This finding indicates that time between tasks may be an important factor in the motivational hypothesis of pride. In a study by Williams and (2008), participants who completed a task and were made to feel proud about their performance demonstrated more perseverance and effort on a later task. In this study, both the first and second tasks were administered during a single visit to the lab. In the current study, students took the second exam several weeks after they experienced pride about their previous exam

scores. It is possible that the motivational effect of pride is potent in the short-term, but does persist over longer periods of time.

Another interesting finding to consider has to do with the relation between trait affect and exam-related affect. Over time, experiencing affective states should theoretically lead to trait-like affect (Roberts & Jackson, 2008). It is likely that the correlation between conscientiousness and trait pride is a result of conscientious individuals frequently achieving their goals, and thus, frequently experiencing state levels of pride. Interestingly, the correlation between exam-specific pride and trait pride was relatively low compared to the correlations between state and trait affect found in Study 2. Study 3 primarily examined feelings about participants' specific behaviors rather than state affect, and feelings about specific behaviors may be different than those experienced at any given moment. Given the large correlations between industriousness and authentic pride, it is possible that only pride about things that one worked hard to achieve or views as important in some way will eventually be incorporated into one's overall trait levels of pride.

Finally, I replicated results from Study 2 showing that conscientiousness is uniquely related to positive affect above and beyond the effect of extraversion and neuroticism. When accounting for overlap with extraversion and neuroticism, conscientiousness still significantly predicted overall trait positive affect, trait attentiveness, and trait pride. This provided further evidence that conscientiousness is genuinely related to positive emotions and this relationship is not the result of an artifact.

CHAPTER 5

GENERAL DISCUSSION

Across three studies, I investigated the relationship between conscientiousness and positive affect. In the first study, I aimed to replicate existing research showing that conscientiousness is related to positive emotions and, more importantly, to discover which specific emotions were related to conscientiousness. In Study 1, using a meta-analysis, I found that conscientiousness was related to overall positive affect, and was most strongly related to the specific emotions of attentiveness and authentic pride. Further, in several sets of primary data, attentiveness fully explained the relation between conscientiousness and overall positive affect. The other emotions in the study only accounted for a small proportion of this association.

Additionally, Study 1 provided a needed update to DeNeve and Cooper's (1998) meta-analysis of the big five and variables related to life satisfaction. DeNeve and Cooper studied relation between positive affect and traits "theoretically related to conscientiousness," and the majority of studies examined internal locus of control, which has been shown to be only modestly related to conscientiousness (e.g., Morrison, 1997). Using these types of studies, estimates for conscientiousness and positive affect were relatively low. Now, formal measures of conscientiousness are widely available and frequently used, so a more precise test of this relationship can be conducted. The current study provided meta-analytic estimates for conscientiousness and positive affect using instruments specifically designed to measure conscientiousness. In doing so, population estimates for conscientiousness and positive affect were substantially higher than those found in DeNeve and Cooper. These results are in line another recent meta-analysis (Heller, Watson, & Ilies, 2004) which also found higher estimates for conscientiousness and life satisfaction than DeNeve and Cooper when using formal measures

of conscientiousness. From Study 1, it appears that the relation between conscientiousness and positive affect is much stronger than is indicated by previous research.

Study 2 built upon and extended findings from Study 1 in a number of ways. First, I employed better measurement of conscientiousness by using three measures of conscientiousness, with two measures that allowed me to examine how positive emotions are related to the different facets of conscientiousness. Additionally, Study 2 contained measures of both trait and state experiences of affect. While all facets of conscientiousness were significantly related to attentiveness, pride, and positive affect, industriousness was most strongly related to these emotions across both facet-level conscientiousness measures. Second, I used factor analysis to determine whether attentiveness and industriousness shared enough properties that they were in fact a single construct. Supporting the current model, it was found that industriousness and attentiveness are indeed distinct constructs. Third, Study 2 formally tested whether any specific facets of conscientiousness are responsible for the correlation between conscientiousness and affect. Industriousness was the only facet of conscientiousness that uniquely predicted affect above and beyond the influence of overall conscientiousness. Fourth, the relationship between conscientiousness and affect was not the result of overlap with extraversion and neuroticism, and conscientiousness remained a significant predictor of attentiveness, pride, and positive affect even when taking into account the influence of extraversion and neuroticism. Finally, Study 2 replicated the finding from Study 1 that attentiveness, but not pride, fully mediated the relation between conscientiousness and overall positive affect. This effect was observed for all three conscientiousness measures.

Study 3 built on results from Studies 1 and 2 to examine the process by which conscientiousness people come to experience positive emotions in a real-life setting.

Specifically, I examined whether conscientiousness was related to academic achievement through its relation to affect, and whether achievements like getting good grades helped to explain the relation between conscientiousness and positive affect. Unlike negative emotions (Fayard et al., 2012), trait positive emotions did not predict performance on exams. In fact, trait positive affect was negatively related to exam performance. However, scores on the first exam were predicted by two facets of conscientiousness: industriousness and self-control. Also unlike negative emotions, experiencing positive emotions about the first exam did not account for increases in performance on exam 2. Studies have suggested that pride, as opposed to general positive affect, should motivate individuals to persist and excel on future tasks (Wegener & Petty, 1994; Williams & DeSteno, 2008). In Study 3, overall positive affect about exams did not lead to improved performance on exam 2. In contrast, these findings were inconsistent with Williams and DeSteno's idea that pride serves a motivational function, as neither trait pride nor exam pride significantly influenced exam performance. One potential explanation for the lack of a motivational effect for pride is Frijda's (1988) law of hedonic asymmetry. Frijda postulates that positive emotions effectively "wear off" if we remain in positive circumstances over time, whereas negative emotions persist if we remain in negative circumstances. If students who felt positively about exams continued to excel in their other courses or in other areas of life, their feelings of pride, attentiveness, and positive affect may not have remained a strong enough motivator to influence their future exam scores.

These three studies highlight the importance of outlining the emotional, cognitive, and behavioral components of personality traits. On the surface, conscientiousness does not appear to have strong ties to positive affect. However, the current studies show that conscientiousness is linked to several types of affective experience. In these studies, I laid the groundwork for the

future study of conscientiousness and positive affect. I first meta-analytically identified the emotions most relevant to conscientiousness. Then, I examined which aspects of conscientiousness best predicted these emotions. Finally, I found that conscientiousness influences goal-oriented behaviors such as academic achievement, which may then lead to experiencing these emotions. Knowing which emotions are most important for conscientiousness will allow researchers to focus their efforts on these key emotions in future studies. For example, attentiveness may be an important factor in understanding the between conscientiousness and executive function in elderly adults.

Limitations

There were a few limitations in each of the three studies reported here. However, to the extent possible, these limitations were rectified in subsequent studies. A limitation of Study 1 is that, compared to negative emotions, there is less consensus as to which are the core positive emotions. I attempted to examine all of the basic positive emotions, and the list of emotions included in the meta-analysis was based on several emotion researchers' ideas about basic positive emotions. Despite this, it is possible that some important emotions were not included in Study 1. For example, affection is a component of love, but no data were available for conscientiousness and affection as a mood state. Although it would have been desirable to examine data on affection, I expect that affection would follow a similar pattern to feeling "in love," which did not account for the relation between conscientiousness and positive affect in the current study.

Second, I restricted the samples in the meta-analysis to studies that included specific positive emotions. This reduced the amount of data for positive affect substantially, as most studies that include correlations between conscientiousness and emotions report only general

positive affect. Despite the limited number of studies, I am confident in the results for overall positive affect, as they follow the same pattern as previous studies (e.g., DeNeve & Cooper, 1998). Finally, Study 1 did not contain facet-level data for conscientiousness; all estimates for positive affect involved broad measures of conscientiousness. Thus, Study 1 was only able to identify emotions relevant to overall conscientiousness, and was not able to determine which specific aspects of conscientiousness were related to affect.

Study 2 addressed the latter limitation by examining a more differentiated model of conscientiousness. To accomplish this, I used two facet-level measures of conscientiousness. One drawback to this approach is that the two facet-level measures did not completely overlap in terms of their facet structure. The CCS assesses the five replicable facets of conscientiousness: industriousness, order, self-control, responsibility, and traditionality. The MacCann conscientiousness scale contains some facets that directly map onto the CCS facets: industriousness, tidiness, and control. Three other facets, procrastination refrainment, perfectionism, and perseverance, appear to measure concepts similar to industriousness and responsibility. Despite not providing a perfect replication, results from MacCann conscientiousness facets showed highly similar patterns to results from the CCS. Finally, Study 2 assessed both trait and state affect. However, trait and state measures operate within a single moment in time and do not capture the process by which conscientious people come to experience affect.

Study 3 sought to expand upon the static nature of Study 2 by examining the interplay among conscientiousness, academic achievement, and affect in a longitudinal study. While Study 3 did capture some of the process by which conscientious people achieve in the academic arena and how this achievement leads to experiencing positive affect, the time frame for the

study was short in comparison to the semester. Study 3 examined only two exams out of four in the course. It is possible that the relation between conscientiousness and affect is much more complex than what was observed in Study 3, and that a longer period of study would prove to be informative. Also, Study 3 only examined trait affect and affect following exam performance. Trait attentiveness and pride did not predict scores on the first exam, and overall trait positive affect negatively predicted these scores. Examining how students feel immediately before their exams, rather than how they feel in general, might add extra predictive power in understanding how affect relates to exam performance. Finally, a limitation of Studies 1, 2 and 3 is that these studies used only self-report data. Using alternative sources of data, such as observer reports, in addition to self-reports may add to the explanation of outcomes such as academic achievement.

Future directions

The results of these three studies introduce an interesting possibility. Conscientiousness was related to both attentiveness and pride, and while attentiveness explained the correlation between conscientiousness and positive affect, pride was also strongly related to conscientiousness. These results lead one to believe that attentiveness and pride may be important to conscientiousness in different ways. Specifically, it is plausible that feeling attentive and being able to focus one's concentration is essential for being able to carry out conscientious behaviors. For example, one might need to be especially attentive in order to complete a tedious task that requires a great deal of persistence. Once a person has directed attentional resources toward carrying out a task, the person will be more equipped to successfully complete the task, and may experience pride as a result. This idea paints a before and after picture: attentiveness may come before performing specific conscientious behaviors, and pride may be a product of those behaviors. In the current series of studies, the data needed to test this

question were not available. Future studies in this area should measure affect immediately before and during completion of a task, as well as after task completion, in order to see if different emotions emerge as important at different points in the process of completing an arduous task. Additionally, attention could be manipulated in order to examine its influence on persistence and task performance.

Another fruitful area of research will be exploring the links between conscientiousness, positive affect, and life satisfaction. According to both DeNeve and Cooper (1998), conscientiousness is consistently related to higher levels of life satisfaction. Heller, Watson, and Ilies (2004) also report that conscientiousness is related to various subtypes of life satisfaction, including marital satisfaction and job satisfaction. It would be interesting to test whether conscientious people eventually become more satisfied with life because they consistently experience more positive affective states and fewer negative affective states. Finally, it would be worthwhile to investigate the circumstances under which pride is more strongly related to conscientiousness. It is possible that the level of effort involved in a task, as well as how important the task is to the person's sense of identity, may influence how much pride conscientious people feel as a result of their behavior.

The line of research discussed in this series of studies highlights the importance of understanding all aspects of personality traits, not simply focusing on behaviors. Emotions may provide additional information above and beyond behavior in understanding how conscientiousness is related to important life outcomes. Seeing the full picture of how conscientiousness leads to these outcomes may help in developing training and interventions in areas such as health, work, and relationships.

TABLES

Table 1

Studies Included in Meta-Analysis

Study	<i>N</i>	Emotion measure	Conscientiousness measure	Sample information
Anastasio (2012)	63	6-item adjective checklist	BFI	Unpublished data
Berenbaum (2000)	62	12-item adjective checklist	NEO-FFI	
Carver, Sinclair, & Johnson (2010)	935	AHPS	BFI	
Cheng, Tracy, & Miller (2010)	102	AHPS	BFI	Unpublished data
Cheng & Tracy (2010)	188	AHPS	BFI	Unpublished data
Diener & Tov (2008)	60	Diener, Smith, & Fujita (1995)	TIPI	Unpublished data

Table 1 (cont)

Konrath (2012)	40	Feelings Questionnaire	BFI	Unpublished data
Rauthmann (2012)	186	PANAS-X	German BFI-K	Unpublished data
Robins (2008)	1,732	PANAS-X	BFI	Unpublished data
Robins (2008)	1,723	PANAS-X	BFI	Unpublished data
Robins (2008)	1,761	PANAS-X	BFI	Unpublished data
Robins (2008)	275	PANAS-X	BFI	Unpublished data
Robins (2008)	511	PANAS-X	BFI	Unpublished data
Robins (2008)	1,999	PANAS-X	BFI	Unpublished data
Robins (2008)	1,793	PANAS-X	BFI	Unpublished data
Robins (2008)	1,711	PANAS-X	BFI	Unpublished data
Robins (2008)	591	PANAS-X	BFI	Unpublished data
Robins (2008)	1,862	PANAS-X	BFI	Unpublished data

Table 1 (cont)

Robins (2008)	1,733	PANAS-X	BFI	Unpublished data
Robins (2008)	1,630	PANAS	BFI	Unpublished data
Robins (2008)	646	PANAS	BFI	Unpublished data
Robins (2008)	1,748	PANAS	BFI	Unpublished data
Robins (2008)	490	PANAS	BFI	Unpublished data
Robins (2008)	2,339	PANAS	BFI	Unpublished data
Robins (2008)	1,805	PANAS	BFI	Unpublished data
Robins (2008)	135	PANAS	BFI	Unpublished data
Robins (2008)	200	PANAS	BFI	Unpublished data
Robins (2008)	1,030	PANAS	BFI	Unpublished data
Robins (2008)	1,609	PANAS	BFI	Unpublished data
Robins (2008)	497	PANAS	BFI	Unpublished data
Robins (2008)	1,124	PANAS	BFI	Unpublished data

Table 1 (cont)

Robins (2008)	2,312	PANAS	BFI	Unpublished data
Robins (2012)	1,396	PANAS, AHPS	BFI	Unpublished data
Robins (2012)	1,215	PANAS, AHPS	BFI	Unpublished data
Robins (2012)	1,506	AHPS	BFI	Unpublished data
Robins (2012)	1,330	AHPS	BFI	Unpublished data
Robins (2012)	1,053	AHPS	BFI	Unpublished data
Robins (2012)	1,474	PANAS, AHPS	BFI	Unpublished data
Robins (2012)	1,359	PANAS, AHPS	BFI	Unpublished data
Robins (2012)	1,880	AHPS	BFI	Unpublished data
Robins (2012)	1,883	AHPS	BFI	Unpublished data
Robins (2012)	2,134	PANAS, AHPS	BFI	Unpublished data

Table 1 (cont)

Sherman, Nave, & Funder (2010)	195	PANAS-X	BFI	Unpublished data; see Sherman et al., (2010)
Tracy & Robins (2007b)	91, 99, 334, 348	AHPS	BFI	
Tracy & Cheng (2011)	186	AHPS	Big Five Aspects	Unpublished data
Tracy & Cheng (2011)	141	AHPS	BFI	Unpublished data
Vaidya, Gray, Haig, Mroczek, & Watson (2008)	299	PANAS-X	BFI	
Vernon, Villani, Schermer, & Petrides (2008)	632	TEIQ	NEO-PI-R	
Watson & Clark (1992)	225, 325	PANAS-X	NEO-PI, NEO-FFI	

Table 2

Population Estimates of Correlations Between Conscientiousness and Positive Affect

	<i>K</i>	<i>N</i>	ρ	95% CI	<i>Q</i>
Overall Pride	64	50,061	.27*	.26, .28	54.69
Single-item “proud”	26	32,667	.20*	.19, .21	29.26
Authentic Pride	19	17,394	.44*	.43, .45	20.93
Hubristic Pride	19	17,390	-.21*	-.23, -.20	17.84
Attentiveness	16	15,566	.52*	.49, .55	32.33*
Happiness/Cheerfulness	16	16,764	.22*	.21, .24	16.39
Excitement	30	40,153	.21*	.20, .21	30.73
Vigor	11	15,665	.23*	.22, .25	9.36
Inspiration	31	40,216	.24*	.23, .25	34.65
Interest	30	40,105	.22*	.22, .23	28.76
Love	11	21,074	.08*	.07, .09	12.18
Wonder	12	12,953	-.01	-.02, .01	1.22
Overall Positive Affect	30	32,725	.42	.41, .43	33.17

Note. *K* = number of samples; ρ = estimated sample-weighted correlation; CI = 95% confidence interval for estimated population correlation; *Q* = heterogeneity statistic.

* $p < .05$.

Table 3

Mediation analyses for positive affect and conscientiousness

Emotion	<i>K</i>	<i>r</i> PA	<i>r</i> Consc	<i>r</i> C-PA	β
Authentic pride	5	.59*	.44*	.44* (.24*)	.23
Single-item pride	25	.53*	.21*	.42* (.37*)	.10
Attentiveness	11	.63*	.54*	.32* (-.02)	.36
Cheerfulness	11	.70*	.22*	.41* (.40*)	.14
Vigor	11	.73*	.23*	.41* (.36*)	.15
Excitement (PANAS-X)	11	.64*	.19*	.45* (.44*)	.10
Excitement (PANAS)	19	.62*	.21*	.46* (.43*)	.11
Interest (PANAS-X)	11	.59*	.22*	.42* (.37*)	.11
Interest (PANAS)	19	.54*	.21*	.42* (.38*)	.11
Inspiration (PANAS-X)	11	.58*	.22*	.42* (.37*)	.12
Inspiration (PANAS)	19	.64*	.25*	.43* (.36*)	.14
Love	11	.22*	.10*	.41* (.40*)	.02

Note. * $p < .05$. *K* = number of samples. *r* PA = average correlation with positive affect measure, *r* Consc = correlation with conscientiousness. *r*C-PA = average correlation between conscientiousness and positive affect measure (partial correlations controlling for each emotion are in parentheses). β = average indirect effect.

Table 4

Correlations between conscientiousness and positive affect variables

Conscientiousness	Authentic Pride		Attentiveness		Positive Affect		<i>M</i>
	Trait	State	Trait	State	Trait	State	
BFI	.57	.56	.61	.45	.50	.48	.53
MacCann et al.	.62	.61	.62	.48	.53	.52	.56
Industriousness	.59	.56	.61	.47	.53	.47	.54
Perfectionism	.41	.39	.44	.33	.40	.40	.40
Tidiness	.35	.37	.30	.20	.25	.28	.29
Procrastination Refrainment	.50	.50	.52	.39	.45	.46	.47
Control	.33	.36	.36	.31	.26	.29	.32
Caution	.41	.42	.46	.37	.38	.33	.40
Task Planning	.51	.50	.51	.40	.47	.47	.48
Perseverance	.64	.60	.61	.45	.52	.47	.55
CCS	.51	.50	.56	.43	.46	.46	.49
Industriousness	.52	.47	.57	.45	.48	.43	.49
Order	.36	.38	.35	.24	.30	.32	.33
Responsibility	.48	.49	.52	.42	.43	.38	.45
Self Control	.29	.31	.39	.34	.25	.27	.31
Traditionality	.27	.22	.28	.21	.27	.31	.26
<i>M</i>	.46	.45	.48	.37	.41	.40	

Note. All correlations were significant at the $\alpha = .05$ level.

Table 5

Correlations among measures of conscientiousness and conscientiousness facets

	CCS						BFI
	Overall	Ind	Order	Resp	SC	Trad	
MacCann et al.							
Overall	.89	.76	.70	.72	.64	.50	.90
Ind	.74	.87	.47	.65	.47	.33	.77
Perfect	.56	.68	.42	.41	.30	.27	.54
Tidy	.70	.41	.88	.45	.39	.36	.69
Procrast	.67	.58	.51	.58	.40	.42	.77
Control	.70	.41	.40	.54	.82	.49	.64
Caution	.59	.52	.36	.49	.59	.30	.55
Plan	.75	.57	.62	.56	.49	.50	.66
Pers	.69	.62	.48	.69	.49	.33	.82
BFI	.83	.73	.67	.71	.58	.40	--

Note. All correlations were significant at the $\alpha = .05$ level. Ind = industriousness, Resp = responsibility, SC = self-control, Trad = traditionality, Perfect = perfectionism, Tidy = tidiness, Procrast = procrastination refrainment, Plan = task planning, Pers = perseverance.

Table 6

Correlations between conscientiousness and attentiveness items

Conscientiousness	PANAS-X Attentiveness Items				<i>M</i>
	Attentive	Alert	Determined	Concentrating	
BFI	.54	.46	.50	.54	.51
MacCann et al.	.53	.50	.52	.53	.52
Industriousness	.51	.48	.51	.52	.51
Perfectionism	.38	.36	.35	.38	.37
Tidiness	.24	.21	.32	.23	.25
Procrastination Refrainment	.45	.43	.43	.44	.44
Control	.35	.32	.25	.31	.31
Caution	.38	.40	.38	.39	.39
Task Planning	.43	.38	.45	.45	.43
Perseverance	.54	.48	.47	.53	.51
CCS	.49	.44	.45	.49	.47
Industriousness	.51	.45	.45	.52	.48
Order	.30	.25	.36	.28	.30
Responsibility	.45	.39	.42	.45	.43
Self Control	.36	.32	.27	.36	.33
Traditionality	.25	.25	.19	.26	.24
<i>M</i>	.42	.38	.40	.42	

Note. All correlations were significant at the $\alpha = .05$ level.

Table 7

Correlations among conscientiousness and affect variables

	1	2	3	4	5	6	7	8	9
1. BFI Conscientiousness	1								
2. CCS Conscientiousness	.83*	1							
3. CCS Industriousness	.73*	.77*	1						
4. CCS Responsibility	.71*	.79*	.69*	1					
5. CCS Self Control	.58*	.74*	.48*	.57*	1				
6. CCS Traditionality	.40*	.67*	.31*	.36*	.42*	1			
7. CCS Order	.67*	.75*	.47*	.45*	.36*	.35*	1		
8. MacCann Conscientiousness	.90*	.89*	.76*	.72*	.64*	.50*	.70*	1	
9. MacCann Industriousness	.77*	.74*	.87*	.65*	.47*	.33*	.47*	.84*	1
10. MacCann Perfectionism	.54*	.56*	.68*	.41*	.30*	.27*	.42*	.65*	.64*
11. MacCann Tidiness	.69*	.70*	.41*	.45*	.39*	.36*	.88*	.74*	.45*
12. MacCann Procrast. Refrain	.77*	.67*	.58*	.58*	.40*	.42*	.51*	.80*	.68*
13. MacCann Control	.64*	.70*	.41*	.54*	.82*	.49*	.40*	.71*	.45*
14. MacCann Caution	.55*	.59*	.52*	.49*	.59*	.30*	.36*	.68*	.57*
15. MacCann Task Planning	.66*	.75*	.57*	.56*	.49*	.50*	.62*	.82*	.66*
16. MacCann Perseverance	.82*	.69*	.62*	.69*	.49*	.33*	.48*	.82*	.67*
17. Trait Positive Affect	.50*	.46*	.48*	.43*	.25*	.27*	.30*	.53*	.53*
18. State Positive Affect	.48*	.46*	.43*	.38*	.27*	.31*	.32*	.52*	.47*
19. Trait Attentiveness	.61*	.56*	.57*	.52*	.39*	.28*	.35*	.62*	.61*
20. State Attentiveness	.45*	.43*	.45*	.42*	.34*	.21*	.24*	.48*	.47*
21. Trait Authentic Pride	.57*	.51*	.52*	.48*	.29*	.27*	.36*	.62*	.59*
22. State Authentic Pride	.56*	.50*	.47*	.49*	.31*	.22*	.38*	.61*	.56*

Table 7 (cont)

	10	11	12	13	14	15	16	17	18
1. BFI Conscientiousness									
2. CCS Conscientiousness									
3. CCS Industriousness									
4. CCS Responsibility									
5. CCS Self Control									
6. CCS Traditionality									
7. CCS Order									
8. MacCann Conscientiousness									
9. MacCann Industriousness									
10. MacCann Perfectionism	1								
11. MacCann Tidiness	.34*	1							
12. MacCann Procrast. Refrain	.38*	.53*	1						
13. MacCann Control	.23*	.47*	.54*	1					
14. MacCann Caution	.53*	.37*	.30*	.53*	1				
15. MacCann Task Planning	.55*	.59*	.58*	.50*	.60*	1			
16. MacCann Perseverance	.40*	.54*	.75*	.59*	.46*	.54*	1		
17. Trait Positive Affect	.40*	.25*	.45*	.26*	.38*	.47*	.52*	1	
18. State Positive Affect	.40*	.28*	.46*	.29*	.33*	.47*	.47*	.83*	1
19. Trait Attentiveness	.44*	.30*	.52*	.36*	.46*	.51*	.61*	.83*	.72*
20. State Attentiveness	.33*	.20*	.39*	.31*	.37*	.40*	.45*	.65*	.79*
21. Trait Authentic Pride	.41*	.35*	.50*	.33*	.41*	.51*	.64*	.75*	.61*
22. State Authentic Pride	.39*	.37*	.50*	.36*	.42*	.50*	.60*	.69*	.66*

Table 7 (cont)

	19	20	21	22
1. BFI Conscientiousness				
2. CCS Conscientiousness				
3. CCS Industriousness				
4. CCS Responsibility				
5. CCS Self Control				
6. CCS Traditionality				
7. CCS Order				
8. MacCann Conscientiousness				
9. MacCann Industriousness				
10. MacCann Perfectionism				
11. MacCann Tidiness				
12. MacCann Procrast. Refrain				
13. MacCann Control				
14. MacCann Caution				
15. MacCann Task Planning				
16. MacCann Perseverance				
17. Trait Positive Affect				
18. State Positive Affect				
19. Trait Attentiveness	1			
20. State Attentiveness	.78*	1		
21. Trait Authentic Pride	.62*	.44*	1	
22. State Authentic Pride	.59*	.50*	.87*	1

Note. * $p < .05$

Table 8

Correlations among conscientiousness, affect, and exam scores

	1	2	3	4	5	6	7	8	9	10
1. Conscientiousness	1									
2. Industriousness	.67*	1								
3. Order	.65*	.20*	1							
4. Responsibility	.73*	.61*	.27*	1						
5. Self Control	.57*	.19*	.17*	.30*	1					
6. Traditionality	.59*	.19*	.18*	.29*	.32*	1				
7. Trait pride	.36*	.47*	.13*	.35*	.10	.13*	1			
8. Exam pride	.14*	.08	.04	.08	.12	.14*	.17*	1		
9. Trait attentiveness	.49*	.55*	.21*	.40*	.23*	.19*	.45*	.15*	1	
10. Exam attentiveness	.16*	.16*	.11	.12	.004	.11	.20*	.42*	.17*	1
11. Trait PA	.35*	.45*	.13*	.34*	.02	.19*	.61*	.02	.74*	.16*
12. Exam PA	.13	.11	.06	.08	-.01	.16*	.15*	.66*	.13*	.78*
13. Exam 1 score	.11	.15*	-.01	.06	.12*	.05	-.05	.55*	.01	.24*
14. Exam 2 score	.08	.22*	-.03	.03	.12	-.07	.07	.21*	.08	.14*
15. ACT score ^a	-.01	.06	.01	-.003	-.03	-.08	.02	-.04	-.07	-.15*
16. SAT score ^b	.02	.19	.05	.10	-.16	-.17	.12	-.06	.02	.11

Note. * $p < .05$. ^a $N = 217$. ^b $N = 56$.

Table 8 (cont)

	11	12	13	14	15	16
1. Conscientiousness						
2. Industriousness						
3. Order						
4. Responsibility						
5. Self Control						
6. Traditionality						
7. Trait pride						
8. Exam pride						
9. Trait attentiveness						
10. Exam attentiveness						
11. Trait PA	1					
12. Exam PA	.12	1				
13. Exam 1 score	-.15*	.39*	1			
14. Exam 2 score	-.02	.18*	.60*	1		
15. ACT score ^a	-.05	-.14*	.06	.13	1	
16. SAT score ^b	.06	-.01	.20	.33*	.72*	1

Note. * $p < .05$. ^a $N = 217$. ^b $N = 56$.

FIGURES

Figure 1. Comparison of one-factor and two-factor models of industriousness and attentiveness.

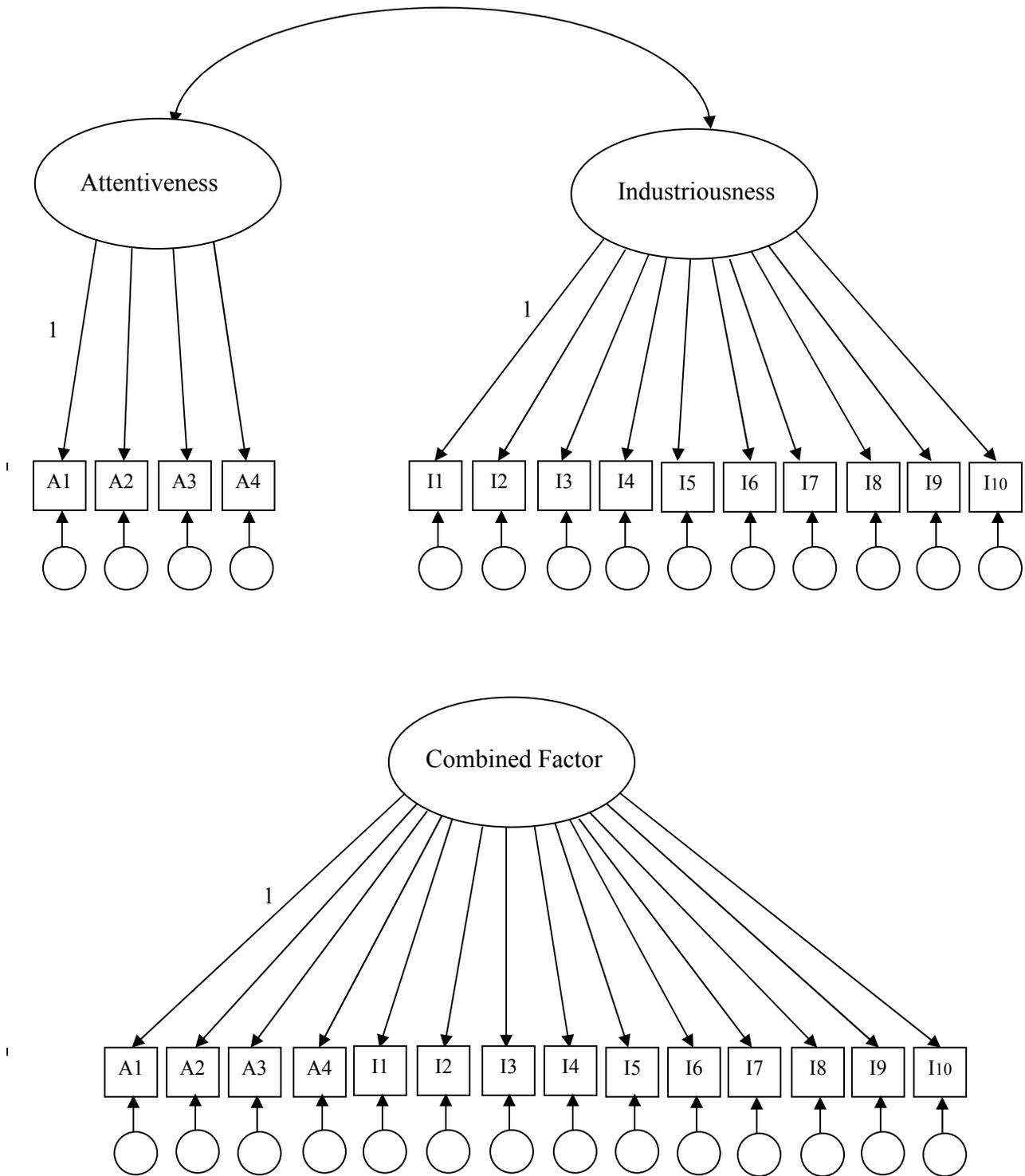
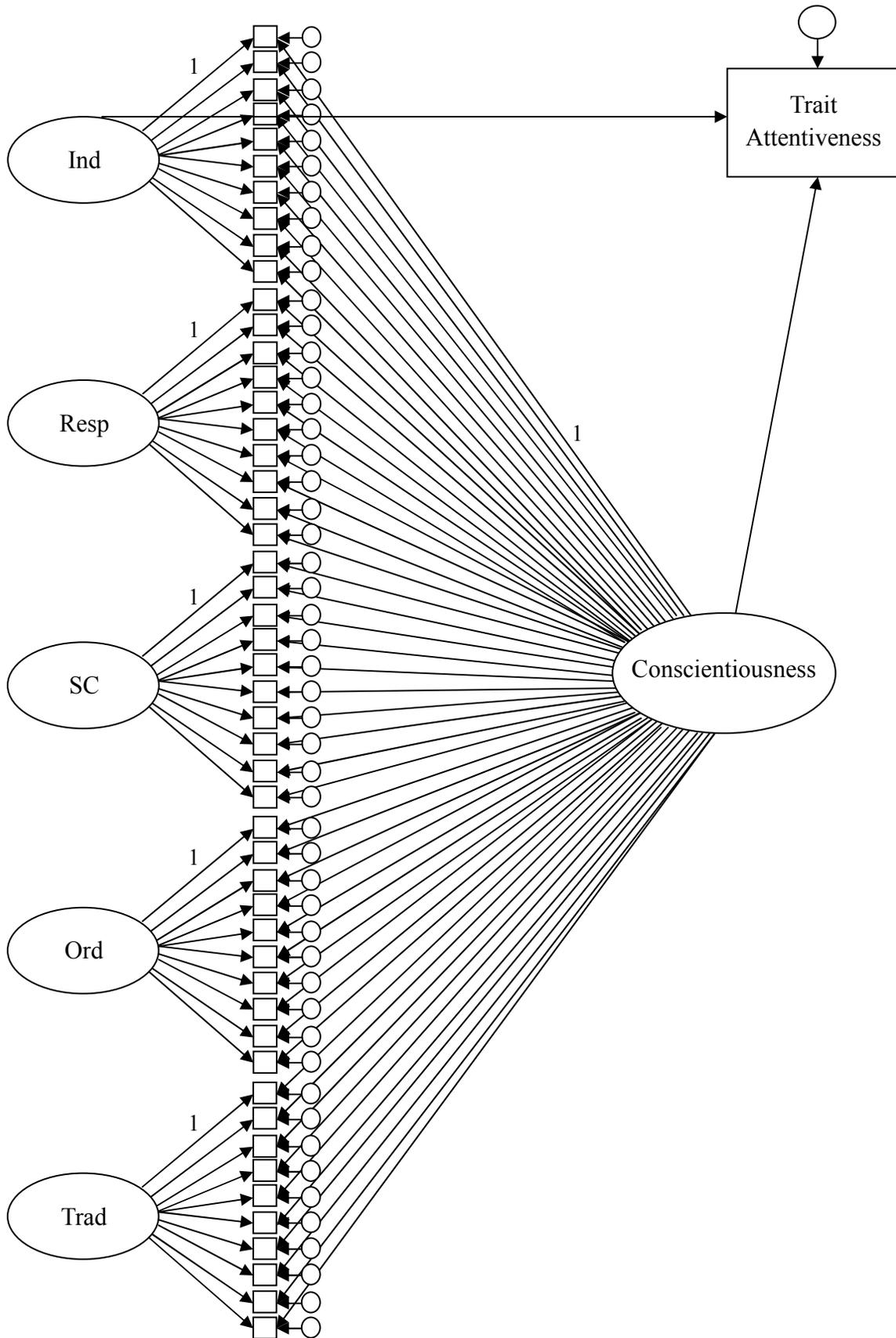


Figure 2. *Bifactor model of conscientiousness, industriousness, and attentiveness.*



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