Conscientiousness

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Abstract

The personality trait of conscientiousness is related to a great number of important life outcomes. To better understand why the influence of conscientiousness is so pervasive, the current article provides a broad overview of the trait. First, the lower-order facet structure of conscientiousness is described, including a description of some of the most common ways to measure both the broad trait as well as the facets. Next, we review the influence of conscientiousness on several life domains and discuss pathways that relate the two. Finally, the development of conscientiousness is explored.

Conscientiousness is a personality trait that is best known for belonging to the taxonomy of the 'Big Five' personality traits (Goldberg, 1993), which also includes extraversion, agreeableness, neuroticism, and openness. Individuals high in conscientiousness tend to follow socially prescribed norms for impulse control, to be goal directed, planful, and to be able to delay gratification (Roberts et al., 2004). While typically thought of as belonging to the Big Five, constructs related to conscientiousness were discussed as far back as Aristotle and are included in classic personality taxonomies set forth by Cattell (1957), Eysenck (1947), Gough (1956), Tellegen and Waller (2008).

As seen in the definition, conscientiousness is not a singular dimension but instead encompasses a broad range of lower-order individual differences. In this review, we first unpack these lower-order facets of conscientiousness, and describe commonly used measures that assess conscientiousness and its lower-order facets. Much of the recent interest in conscientiousness stems from its associations with a number of important life outcomes. Thus, in the following section, we discuss the relationship between conscientiousness and important life outcomes, detailing how lower-order facets can help explain these associations. Finally, we describe the development of conscientiousness over the life span, focusing on the lower-order components.

The Lower-Order Structure of Conscientiousness

Personality traits describe the relatively enduring patterns of thoughts, feelings, and behaviors of individuals. While typically thought of as decontextualized constructs, traits can range from broad, overarching concepts to more specific, concrete manifestations. In other words, personality traits can be conceptualized as existing within a hierarchical structure, with broad constructs structured above more specific, lower-order facets of these traits, and behavioral, cognitive, and affective manifestations of these traits falling at even lower ends of the hierarchy (Jackson et al., 2009; Markon et al., 2005; Roberts et al., 2004). At the highest levels of the hierarchy, personality traits can be meaningfully organized into two (Digman, 1997), three (Tellegen and Waller, 2008), and even four factors (Markon et al., 2005), before settling into the well-known Big Five factors (Goldberg, 1993).

Similar to the hierarchical structure of personality traits, the trait of conscientiousness can be decomposed into narrower, lower-order facets, which can be broken down even further into more concrete behaviors, thoughts, feelings, and habits, like setting goals for oneself or turning work in on time. At the most basic two-factor division, conscientiousness can be thought of as consisting of two components, a proactive component and an inhibitory component (Costa et al., 1991; Jackson et al., 2010; Roberts et al., 2005a). The proactive component refers to being goal oriented and striving to do well in one's endeavors, while the inhibitory component refers to being responsible, delaying gratification, and controlling impulses. Together, these two overarching components provide a structure under which the rest of the facets can be organized. It should be noted that an alternative perspective finds that the two-facet structure of conscientiousness consisting industriousness and orderliness (DeYoung et al., 2007). While this two-factor solution may initially seem similar to the proactive and inhibitory components of conscientiousness, empirical examinations of the lower-order structure of conscientiousness show that industriousness and orderliness fall in the proactive component only (Roberts et al., 2005a).

More clearly defined facets emerge as one moves down the conscientiousness hierarchy. Three-factor solutions typically consist of factors associated with achievement, self-control, and responsibility (Jackson et al., 2010; Roberts et al., 2005a), though few studies have explicitly tested three-factor solutions. Perhaps the most agreed upon level of analysis for conscientiousness is the four-factor solution. Numerous studies identify four interpretable factors, namely orderliness, industriousness, responsibility, and self-control (Jackson et al., 2010; Peabody and De Raad, 2002; Roberts et al., 2004). While these four facets replicate across most studies, additional facets of conscientiousness, such as conventionality and formality, appear further down the hierarchy (Roberts et al., 2004, 2005a). Currently, however, these additional facets do not replicate across studies as consistently as the four-factor solution, making it difficult to identify the structure of five-factor solutions or greater.

Two facets of the four-factor solution, orderliness and industriousness, fall under the proactive domain of conscientiousness. Individuals high in orderliness are likely to be neat and clean, and situate their belongings in an organized

fashion (Jackson et al., 2009). To a lesser extent, orderliness also includes one's proclivity toward making and adhering to plans and utilizing to-do lists and planners that aide in a more organized and orderly day. Industriousness refers to how hard-working one is, as well as one's ability to persevere and strive for success. Industrious individuals like to finish what they start, and will work long hours or even take on extra work in order to do a thorough job (Jackson et al., 2009, Mike et al., 2014). Individuals low in industriousness may avoid work, procrastinate, or give up easily when facing adversities. Naturally, high levels of industriousness are associated with succeeding in achievement domains such as academics and work.

Self-control falls on the inhibitory side of conscientiousness. Self-control may be labeled differently from measure to measure and is commonly called impulse control, impulsivity (reversed), constraint, or self-discipline. Within other fields, it may even be referred to as effortful control or executive functioning (DeYoung, 2011). Regardless of the name, self-control refers to the ability to inhibit impulses and avoid being reckless or out of control. Individuals high on self-control are able to put off immediate gratification in order to attain larger goals. Individuals low on self-control are more likely to make impulsive purchases, to put off or cancel plans at the last minute, and to be unable to control reactions when feeling angry or frustrated (Jackson et al., 2010). As indicated in the dissent in naming this construct, many disagree as to which Big Five trait self-control is associated with. Sometimes self-control is considered to be a facet of extraversion because of its relationship with sensation seeking; self-control can also be thought of as a component of neuroticism, where impulsive actions are likely to occur because of emotional instability (DeYoung, 2011). However, continuing evidence indicates that self-control is primarily related to conscientiousness (Paunonen, 1998; Roberts et al., 2004).

The final facet of the four-factor solution, responsibility, can be considered as both inhibitory and proactive. Sometimes referred to as reliability, this facet describes one's tendency to uphold obligations and follow rules. Those high in responsibility are less likely to break promises, miss appointments, or oversleep (Jackson et al., 2010). Those low on responsibility may be described as unreliable or flighty and are more likely to bend or break rules. The facet of responsibility often tends to be strongly associated with the trait of agreeableness, partly because the behaviors associated with the facet frequently involve an interpersonal context.

Conceivably, conscientiousness consists of more than four factors, and, indeed, solutions up to eight factors have been found (Roberts et al., 2004). Three additional facets are of particular note, as they have independently emerged across a number of different studies: conventionality, formality, and punctuality (MacCann et al., 2009; Roberts et al., 2004, 2005a). Conventionality is the inclination to support and follow the norms of society in order to maintain good social environments. Individuals high in conventionality are more likely to uphold family and cultural traditions, while individuals low in conventionality may be described as nonconforming or untraditional. Conventionality also extends to having more traditional or conservative beliefs, particularly within the political and spiritual spectrum, and is closely related to the trait of openness to experience (Johnson, 1994). Those high in formality can best be described as having a sense of propriety, which includes being polite and proper, and keeping one's physical appearance neat and clean. They may call others by formal titles, say please and thank you, and are less likely to swear. It should be noted that despite the different definitions for conventionality and formalness, in practice it is often difficult to meaningfully differentiate between the two as they are highly related (Jackson et al., 2010).

Finally, punctuality describes the practice of doing things in a timely manner and could be considered the narrowest facet of conscientiousness. Interestingly, however, punctuality tends to be equally related to each of the other facets of conscientiousness – unlike the other facets of conscientiousness – and thus could serve as a useful marker for overall levels of conscientiousness (Jackson et al., 2010).

In summary, conscientiousness consists of many distinct lower-order facets. Much like higher order personality traits, facets of conscientiousness can be ordered in a hierarchy. While the overarching concept of conscientiousness is generally agreed upon, a standard facet-level structure has not reached consensus. The most commonly identified facets are orderliness, industriousness, self-control, and responsibility (Roberts et al., 2012). However, five-factor solutions, which typically include conventionality or decisiveness, have been suggested (Jackson et al., 2009; Saucier and Ostendorf; Peabody and De Raad, 2002). Further down the hierarchy, there are 6-, 8-, and even 9-component solutions that may represent reasonable factor structures (MacCann et al., 2009; Madhavan, 2004; Roberts et al., 2004, 2005), though there has been less research to replicate these findings. As such, the measurement of conscientiousness reflects the discrepancy in facet solutions, as facets names and number of facets vary from scale to scale.

How to Measure Conscientiousness

Numerous measures of conscientiousness exist. Many of these measures belong to larger omnibus inventories that assess all of the Big Five factors, though some come from measures outside of the Big Five. The choice of which measure to use depends upon the researcher's needs and time constraints. Some measures aim to assess only the broad construct of conscientiousness while others break the assessment up into specific facets. Adding to the confusion, many of these facet measures have names that are specific to the scale, making comparisons across measures difficult. Measures also vary in length, ranging from two items to dozens of items.

One of the most common measures of conscientiousness is from the NEO-PI-R (Costa and McCrae, 1992). Though it was originally designed to measure only neuroticism, extraversion, and openness (hence NEO), it was later revised to include agreeableness and conscientiousness. The 48-item NEO measure of conscientiousness includes six facets, which are labeled: competence (closely related to the facet of industriousness), order, dutifulness (responsibility), achievement striving (industriousness), self-discipline (self-control), and deliberation (self-control). A related measure is the NEO-FFI, which is an abridged version of the NEO-PI-R, including only 12

items for conscientiousness. The NEO-FFI was not designed to assess particular facets but was intended to briefly measure the Big Five under time constraints. However, further research has indicated that the NEO-FFI can be used to assess a limited number of broader facets (Chapman, 2007; Saucier, 1998). For conscientiousness, this includes orderliness, goal-striving (industriousness), and dependability (responsibility).

Another common measure of conscientiousness is the Abridged Big Five Circumplex (AB5C; Hofstee et al., 1992). The AB5C has 486 items and includes nine facets of conscientiousness: organization, purposefulness, efficiency, rationality, dutifulness, orderliness, conscientiousness, perfectionism, and cautiousness. Unfortunately, these facets do not adequately cover the facets of conscientiousness discussed above, and appear to reduce to a three-factor solution (Roberts et al., 2005a). The purposefulness, efficiency, and rationality scales tap industriousness, while the perfectionism scale is mostly associated with orderliness; cautiousness being the only scale that reflects the self-control facet (Roberts et al., 2005a). Part of the reason for this lack of coverage is the way the AB5C derived its facets. The AB5C creates facets by crossing one Big Five trait with another under the idea that items do not neatly describe a single trait but instead are blends of multiple traits (e.g., being responsible may represent high levels of conscientiousness and agreeableness). Unfortunately, it appears that not all combinations of traits had an adequate number of items to meaningfully differentiate between these nine facets, resulting in a reduced number of facets captured.

The Big Five Inventory (BFI; John et al., 1991) is commonly used to measure the Big Five traits and includes nine items on conscientiousness. The BFI is a shorter length omnibus inventory and thus was not initially developed to measure facets of conscientiousness. However, two facets of conscientiousness may be captured using the BFI: self-discipline (self-control) and order (Soto and John, 2009).

The Ten Item Personality Inventory (TIPI, Gosling et al., 2003) was developed to be a very short and efficient measure of conscientiousness. Consisting of just two conscientiousness items, individuals rate how much they agree with the statements, "I see myself as dependable, self-disciplined," and "I see myself as disorganized, careless" (reverse-scored). Though longer measures are generally preferable (Credé et al., 2012), short measures such as the TIPI do provide adequate assessment of conscientiousness if one is under extreme time constraints.

The Multidimensional Personality Questionnaire (Tellegen and Waller, 2008) departs from the previous measures in that it does not explicitly measure the Big Five but instead focuses on the Big Three (positive emotionality, negative emotionality, and constraint). Here, conscientiousness is captured by constraint, which encompasses the lower-order facets of self-control, traditionalism (conventionality), and harm avoidance (which is more closely related to neuroticism and agreeableness). Another divergence from previous measures is that the 77-item constraint measure uses true–false items rather than likert scales.

The Hogan Personality Inventory (Hogan, 1992) has 206 items used to measure six personality trait dimensions called intellectance, adjustment, prudence, ambition, sociability, and likeability. Here, conscientiousness is referred to as prudence and is intended to identify individuals who are conscientious, conforming, and dependable. Facets of prudence are moralistic (conventional), mastery (industriousness), virtuous (formality), not autonomous (industriousness), not spontaneous (self-control), impulse control (self-control), and avoids trouble (responsibility).

A relatively new measure of conscientiousness is the Chernyshenko Conscientiousness Scales (Hill and Roberts, 2011). Six different facets are assessed across 60 items (orderliness, self-control, responsibility, traditionalism (conventionality), industriousness, and virtue). The virtuous facet is unique in that it assesses the tendency for conscientiousness individuals to be responsible members of the community who are honorable and rule abiding. It shares some overlap with the responsibility facet but is broader in scope and concerns issues of right and wrong rather than the tendency to follow through with personal obligations.

Conscientiousness can also be assessed using adjectives rather than statements (Saucier and Goldberg, 1996). The Conscientiousness Adjective Checklist (Jackson et al., 2009; Roberts et al., 2004) was designed to do exactly that. It consists of 123 personality adjectives that measure the facets of conscientiousness. This includes orderliness, industriousness, impulse control, responsibility, conventionality, and decisiveness (Roberts et al., 2004). Examples of adjectives included in the scale are organized, precise, thorough, responsible, reliable, and cautious.

Typical measures of personality traits such as the ones described above collapse items that tap thoughts, feelings, and behaviors to create an overall composite trait score. However, a scale was created in order to solely target the behavioral manifestations of conscientiousness, eschewing the assessment of thoughts and feelings (Jackson et al., 2010). Assessing only behaviors results in a more precise measure of an important component of conscientiousness, as such a scale will assess simply whether or not people behave conscientiously – regardless of their thoughts or feelings. The Behavioral Indicators of Conscientiousness scale (BIC; Jackson et al., 2010) includes a large pool of conscientiousness behaviors (185 behaviors ranging from cleaning a toilet, to canceling plans, to writing down important dates) that are rated on how often respondents engage in those behaviors. The BIC is ordered hierarchically and consists of a number of lower-order facets, depending on how broad or narrow the researcher's interest. Behavioral facets include: avoiding work, organization, impulsivity, antisocial behaviors, cleanliness, laziness, industrious, punctuality, formalness, responsibility, and appearance.

Other measures of conscientiousness that are less common, but just as valid, include the 20-item conscientiousness measure from the HEXACO inventory (Lee and Ashton, 2008). In this scale, conscientiousness is measured by assessing four facets: organization (orderliness), diligence (self-control), perfectionism (industriousness), and prudence (self-control). The Big Five Aspect Scale (BFAS; DeYoung et al., 2007) assesses two facets per Big Five trait (industriousness and orderliness for conscientiousness) using 10 items. Finally, the International Personality Item Pool (http://ipip.ori.org/) is a useful resource that offers a number of conscientiousness measures in addition to the AB5C and BFAS.

Conscientiousness and Important Life Outcomes

Conscientiousness plays an integral role in many important life outcomes, spanning success in school to living a longer and healthier life. Often, the associations between conscientiousness and these life outcomes are at levels equal to, if not better than, gold-standard predictor variables such as intelligence or socioeconomic status (Roberts et al., 2007b). This section discusses the various outcomes linked to conscientiousness and considers pathways responsible for each of the associations.

Conscientiousness is one of the best predictors of academic achievement, predicting GPA above and beyond even intelligence (Noftle and Robins, 2007). Conscientious students tend to have better grades, especially those who are high on the facet of impulse control (MacCann et al., 2009; Noftle and Robins, 2007; Paunonen and Ashton, 2001). These positive associations between conscientiousness and academic achievement are thought to be the result of how conscientious students think about school, their abilities, and the effort they put into achieving their academic goals. Conscientious students are more motivated to succeed in academic settings (Richardson and Abraham, 2009) and believe in their ability to be successful (Caprara et al., 2011). They are also more likely to couple their interests and self-concept in the domains in which they are successful (Denissen et al., 2007). For example, a conscientious student who makes good grades in geography is likely to both feel like she is good at geography and also be interested in geography. This interest flows back into one's achievement behaviors, which ultimately leads to higher grades. In general, conscientious students also devote more time to studying, completing projects, and turning assignments in on time. Together these characteristics make it more likely that conscientious students persevere in school, even through difficult or stressful situations.

As individuals leave school and enter into the work force, conscientiousness is again an important key to success. Conscientious people tend to earn more money (Ng et al., 2005; Spurk and Abele, 2011), are more satisfied with their jobs (Bowling and Burns, 2010; Ng et al., 2005), and are more likely to receive promotions (Ng et al., 2005) compared to those low in conscientiousness. Just as academic success was driven by the fact that conscientious individuals were engaged in effective academic behaviors, they are also, in effect, good workers. Conscientious individuals have greater career achievement related goals (Spurk and Abele, 2011), better attitudes toward their work (Bowling and Burns, 2010; Ng et al., 2005), they show more commitment to their jobs, and work well independently as well as in groups (Spurk and Abele, 2011; Sutin and Costa, 2010). Moreover, conscientious individuals tend to avoid detrimental activities such as stealing, drinking on the job, being tardy or missing work, and they are less likely to leave their jobs (Bowling and Burns, 2010; Roberts et al., 2007a).

Conscientiousness is also related to health and physical well-being. People who are conscientious report having fewer health problems than people who are not conscientious (Friedman et al., 1993; Lodi-Smith et al., 2009; Roberts et al., 2009) and conscientious individuals tend to live longer than their nonconscientious counterparts (Friedman et al., 1993; Hill and Roberts, 2011; Roberts et al., 2007b). Those low in conscientiousness are also more likely to develop specific diseases. such as metabolic syndrome, Alzheimer's disease, lung disease, and heart disease, and are also more likely to have a stroke (Sutin et al., 2011; Terracciano et al., 2013; Weston et al., 2014).

Most likely, conscientiousness individuals have more positive health outcomes due to engaging in more healthful behaviors, such as exercising and eating well (Lodi-Smith et al., 2009). Similarly, they are more likely to avoid unhealthful behaviors (Hampson et al., 2000), such as smoking, using drugs, alcohol, or engaging in risky driving or sexual behaviors (Jackson et al., in press; Weston and Jackson, in press; Roberts and Bogg, 2004; Friedman et al., 1995). If health issues do arise, conscientious individuals are more likely to adhere to their medical regimens (Hill and Roberts, 2011). By following their doctors' advice, and taking prescribed medications as needed, they are better able to overcome health ailments and prevent health declines. The association between conscientiousness and health emerges early in life – childhood levels of conscientiousness and related facets predict longevity and markers of health decades later (Friedman et al., 1993; Moffitt et al., 2011).

Conscientiousness also plays a role in the success and maintenance of romantic relationships. Conscientious people are less likely to get divorced (Solomon and Jackson, 2014), with some studies demonstrating conscientiousness' effect across decades (Roberts and Bogg, 2004). Likely this is a result of people high in conscientiousness having higher levels of relationship satisfaction and commitment levels (Dyrenforth et al., 2010; Solomon and Jackson, 2014b). In addition, highly conscientious people do fewer things to jeopardize their relationships (Hill et al., 2013). For example, infidelity is one of the main reasons for divorce, and conscientious individuals are less likely to cheat on their spouses (Buss and Shackelford, 1997). They are also less likely to abuse their spouses (Buss, 1991). Similarly, conscientious people are more likely to engage in relationship maintenance behaviors, such as correcting interpersonal mistakes and engaging in constructive problem solving (Baker and McNulty, 2011). Finally, conscientious individuals are more forgiving (Hill and Allemand, 2012), likely resulting in fewer disagreements and fights among couples.

Finally, it is noteworthy that the effects of conscientiousness on various life domains can extend beyond the conscientious individual and into the lives of close others. For example, the spouses of conscientious individuals tend to have better health outcomes (Roberts et al., 2009c) and work outcomes (Solomon and Jackson, 2014a).

While being high in conscientiousness has great benefits for school, work, health, and relationships, being low in conscientiousness can have serious negative consequences. First, levels of conscientiousness can have financial repercussions. Those low in conscientiousness are poor at managing their finances. They are less likely to save money and often have low credit scores (Bernerth et al., 2012; Webley and Nyhus, 2006). People low in conscientiousness are also more prone to gamble, particularly if they are highly impulsive (Myrseth et al., 2009). Moreover, individuals low in conscientiousness are more likely to engage in criminal behaviors (Jones et al., 2011; Wiebe,

2004), and low levels of conscientiousness predict getting arrested more often (Clower and Bothwell, 2001). Once arrested, prisoners with low conscientiousness levels spend a longer time in prison (Ireland and Ireland, 2011). Overall, it appears that conscientious individuals have positive life outcomes though engaging more often in constructive behaviors and avoiding harmful and counterproductive behaviors.

Development of Conscientiousness over the Life Span

While personality traits are relatively stable, they also demonstrate a degree of malleability and retain the capacity to change across the life. This means that conscientiousness is not a static construct, but can change over time – with individuals either increasing or decreasing with age. There are multiple ways to conceptualize this change. First, change can be thought of in terms or rank order stability – that is, how a person ranks on a trait compared to others. The rank order stability of conscientiousness increases steadily with age until plateauing between the ages of 50 and 70 (Caspi et al., 2005; Roberts and DelVecchio, 2000). This means that an individual who is above average on conscientiousness as a child will likely be above average on conscientiousness as an older adult.

However, these traits also remain open to outside influences and can change and develop over time. Mean level changes, or how a trait changes in absolute terms, also occur across the life span. In general, mean level changes in personality traits occur in the direction of greater psychological maturity (Roberts et al., 2008). Unsurprisingly, conscientiousness is part of this general trend toward maturity, and typically individuals increase in conscientiousness throughout the life span. Across a number of cross sectional and longitudinal studies conscientiousness was found to increase from young adulthood up to the age of 60 (Roberts et al., 2003b; Soto and John, 2012). This normative pattern of development replicates across a number of different cultures and countries, including Germany, Italy, Portugal, Croatia, South Korea (McCrae et al., 1999). Out of all of the Big Five traits, conscientiousness is the trait that evidences the largest increases, with increases as large as one full standard deviation across the life span (Roberts et al., 2005b).

While conscientiousness tends to increase across the life span, the rate and direction of change differs depending on age. Young adulthood has been identified as an especially important period for personality development and is possibly the period when personality traits change the most (Roberts et al., 2006b). In late childhood and adolescence, conscientiousness may demonstrate a negative trend before beginning to increase in young adulthood and continue to increase throughout adulthood (Soto et al., 2011). In old age, there is some recent evidence that conscientiousness may again demonstrate declines (Wortman et al., 2012). In general, findings regarding the trajectory of change in old adulthood are less cohesive than those for young and middle adulthood, as not all studies find older adults lower in conscientiousness (Allemand et al., 2008; Jackson et al., 2009).

The longitudinal studies of development that identify declines in conscientiousness during old age may differ from the studies that do not find declines in older adulthood in part because of the measures used to assess conscientiousness. Although conscientiousness as a whole generally increases across the life span, the facets of conscientiousness may each have unique developmental trajectories, demonstrating different trends from one another as well as from conscientiousness overall. Several studies examining the specific patterns of the development of conscientiousness facets find evidence for differences in development across the facets. For example, self-control increases across young adulthood and old age (Jackson et al., 2009; Soto et al., 2011). Industriousness demonstrates a similar pattern, increasing across the life span, though some evidence suggests that most of the changes occur earlier in adulthood (Jackson et al., 2009; Soto and John, 2012; Terracciano et al., 2005). Evidence regarding the development of responsibility suggests steady increases throughout the life span (Jackson et al., 2009). Conventionality does not show differences from young adulthood to middle adulthood, but older adults were found to be significantly more conventional than middle-aged adults (Jackson et al., 2009). Finally, the facet of orderliness differs from previous facets, as orderliness undergoes virtually no changes across the life span (Jackson et al., 2009; Soto et al., 2011, Soto and John, 2012). Overall, increases in conscientiousness earlier in life can be thought of as mainly resulting from increases in impulse control and industriousness, while increases in later adulthood are driven by changes in impulse control, reliability, and conventionality.

While the majority of people increase in conscientiousness as they age, there is a significant amount of people who do not change at all on conscientiousness, or perhaps even decrease (Lüdtke et al., 2011). These variations in development are thought to occur because of the unique experiences people go through and the roles that they take on throughout life (Lodi-Smith, 2007). While it is still unclear what experiences drive changes in conscientiousness, a number of studies have begun to associate life experiences with changes in conscientiousness.

Some of the most influential experiences relate to achievement, particularly achievement within academic settings. Students tend to increase in conscientiousness during their final year of high school, likely in preparation for the new responsibilities they anticipate taking on in college or in the workforce (Bleidorn, 2012). However, individual experiences are important as not everyone follows this pattern. Those who are not invested in school tend to change less compared to those that do invest in school. Similarly, failing an exam is associated with decreases in conscientiousness compared to those that did not fail an exam (Lüdtke et al., 2011).

Leaving school and obtaining one's first job is also associated with increases in conscientiousness (Specht et al., 2011). Similar to the findings in school settings, individuals who invest in their work also tend to increase in conscientiousness (Roberts et al., 2003a; Roberts et al., 2006a). Again, the opposite is also true; people who de-invest in work, such as committing counterproductive work behaviors, tend to become less conscientious, contrasting the typical developmental trend (Hudson et al., 2012; Roberts et al., 2006a).

In addition to one's level of conscientiousness predicting health and health behaviors, changes in conscientiousness also relate to health and changes in health behaviors. In one study, increases in conscientiousness were positively related

with changes in preventative health behaviors, such as healthy eating, exercising, and safe driving (Takahashi et al., 2013). These findings suggest that changes in conscientiousness are associated with changes in the health process. Likely, as people increase in conscientiousness, they increase in the ability and tendency to take better care of themselves, ultimately resulting in better overall health (Takahashi et al., 2013). Changes in health behaviors can also help explain changes in conscientiousness. For example, low levels of conscientiousness are associated with substance abuse in middle age, and continued substance abuse in turn is associated with nonnormative decreases in conscientiousness (Roberts and Bogg, 2004).

There is evidence that romantic relationships can impact the development of conscientiousness. For one, simply entering into a first romantic relationship can lead to increases in conscientiousness (Neyer and Asendorpf, 2001; Neyer and Lehnart, 2007). Relationship length may also have important implications for development. Evidence suggests that the longer women stay married, the more conscientious they become (Roberts and Bogg, 2004). Such increases may be a function of how conscientious behaviors are rewarded in the context of the relationship. Finally, divorce can impact conscientiousness, though evidence suggests effects differ depending on one's gender. One study found that conscientiousness increased after a divorce (Specht et al., 2011), while another study, consisting solely of women, found conscientiousness decreased after a divorce (Roberts and Bogg, 2004). Though further research is needed to determine the nature of these findings, one possible explanation is that divorced women may have fewer responsibilities because they no longer have to take care of their husbands, resulting in lower levels of reported conscientiousness, whereas men's responsibilities may increase after a divorce.

Criminality and externalizing behaviors, two correlates of conscientiousness, exhibit patterns of change over time that seem to complement the way conscientiousness develops (Roberts et al., 2009a). Criminality and externalizing behaviors are at their highest at ages when people are lowest in conscientiousness, and they decrease as conscientiousness increases. It is unclear whether changes in criminality and externalizing behaviors are associated with changes in conscientiousness, though some emerging studies suggest this is the case. For example, the development of conscientiousness is related to the development of drinking and drug use behaviors such that decreases in alcohol usage are related to increases in conscientiousness and impulse control (Littlefield et al., 2010). Similarly, decreases in tobacco consumption are related to increases in the facet of responsibility (Roberts and Bogg, 2004).

Conclusion

Conscientiousness is a hierarchical structure that, at its broadest level, describes individual differences in the tendency to be industrious, organized, responsible, and self-controlled, while, at its lowest level, describes specific behaviors related to these traits, such as keeping appointments and cleaning regularly. There are numerous ways to assess conscientiousness, and it is possible to do so at nearly every level of the hierarchy – from measures that look at conscientiousness as a whole to those that only examine behaviors. It is hoped that future researchers will use narrower levels of analysis to better understand the relationship between conscientiousness and life outcomes as well as to better understand how conscientiousness may development over the life span.

See also: Big Five Factor Model, Theory and Structure; Five Factor Model of Personality, Assessment of; Five Factor Model of Personality, Facets of; Personality Assessment: Overview; Personality and Educational Outcomes; Personality and Values at Work; Personality, Trait Models of.

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