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Development of conscientiousness in childhood and adolescence: Typical trajectories and associations with academic, health, and relationship changes

Allison M. Tackman [a,*,1], Sanjay Srivastava [a,1], Jennifer H. Pfeifer [a], Mirella Dapretto [b]

[a] Department of Psychology, University of Oregon, United States
[b] Department of Psychiatry and Biobehavioral Sciences, University of California, Los Angeles, United States

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ABSTRACT

Conscientiousness is related to a range of important life outcomes, so it is important to understand its development early in life. We examined how conscientiousness changes from late childhood through middle adolescence and what other psychosocial changes it co-occurs with. We developed and validated a conscientiousness scale for use in existing data. Then in a longitudinal study of participants at ages 10, 13, and 16 ($N = 90$ at Time 1) we used growth curve modeling to examine how conscientiousness co-develops with academic, health, and relationship functioning. Mean levels of conscientiousness decreased from 10 to 13 and then increased to age 16. The later increase was stronger among females. Changes in conscientiousness were associated with adaptive changes in other variables.

1. Introduction

Conscientiousness is increasingly being recognized as a critical dimension connecting personality to diverse socially and economically important life outcomes. This personality domain, which has emerged in the Big Five and Big Six structural models of personality (Saucier & Srivastava, 2014), is robustly linked to health and longevity (Kern & Friedman, 2008; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007), educational and occupational attainment (Barrick, Mount, & Judge, 2001; Noftle & Robins, 2007), and relationship stability and satisfaction (Roberts et al., 2007; Solomon & Jackson, 2014). Thus, research on the development of conscientiousness – how it changes, and what those changes are linked to – may ultimately help in creating policies or interventions that promote socially desired outcomes, in addition to advancing a basic understanding of the nature of conscientiousness.

The goal of the present studies is to build on a small but growing body of research on how conscientiousness develops in childhood and adolescence. In a preliminary study, we developed a new conscientiousness scale that can be scored from an existing measure, allowing us to take advantage of an existing longitudinal dataset (and potentially facilitating similar future efforts with other datasets). We then addressed two major questions in our main study. First, what is the typical growth trajectory of conscientiousness from ages 10 to 16, and is the average trajectory different among boys than among girls? To answer this, we looked at average trajectories in growth curve models to see if we could replicate previous findings in a new sample with new measures. Second, how are changes in conscientiousness associated with changes in academic, health, and relationship variables? To answer this, we looked at correlated growth curves to see how individual differences in the rate of change of conscientiousness were associated with changes in the other variables.

1.1. Typical development of conscientiousness in childhood and adolescence

To date, a substantial literature has focused on the development of conscientiousness in adulthood. We know that conscientiousness is one of a family of traits (along with agreeableness and emotional stability) that typically changes in the direction of greater maturity (Roberts, Walton, & Viechbauer, 2006; Srivastava, John, Gosling, & Potter, 2003). These changes have been linked to transitions into adult roles and maturation within them (Bleidorn et al., 2013; Roberts & Wood, 2006).

* Corresponding author at: Department of Psychology, University of Arizona, Tucson, AZ 85721, United States.
E-mail address: tackman@email.arizona.edu (A.M. Tackman).

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What about childhood and adolescence? Depending on one's perspective, research on conscientiousness during these age periods is either very old or very new. Temperament researchers have long been interested in constructs like ego resiliency (Block & Block, 1980) and effortful control (Rothbart & Rueda, 2005) that have theoretical overlaps with conscientiousness, though differences in specificity and level of analysis can make it hard to draw one-to-one relationships with the Big Five personality dimensions (see Shiner, 2006). More recently, research on the structure of the youth personality has begun to show that the same conscientiousness dimension that characterizes adult personality can also be explicitly identified and measured among children and adolescents (Soto & John, 2014; Tackett, Krueger, Iacono, & McGue, 2008). This work has made it possible to move past the "jangle problem" (using different names for the same traits in childhood and adulthood) and explicitly study conscientiousness in childhood and adolescence.

The present study focused on the development of conscientiousness during the transition from childhood to adolescence (specifically, ages 10 through 16), a period when there is good reason to expect substantial changes in the average child's personality. In general terms, this is a period marked by extensive changes in many domains, including biological changes (e.g., onset of puberty), psychological changes (e.g., increases in internalizing and externalizing behavior), social changes (e.g., enhanced saliency of peers), and educational changes (e.g., transition from primary to secondary school) (Steinberg & Morris, 2001). Research has demonstrated that (some of) the Big Five personality traits also show meaningful changes during this period. Regarding conscientiousness, cross-sectional and longitudinal studies have begun to converge on a common trajectory underlying the typical development of this trait during the transition from childhood to adolescence. Denissen, van Aken, Penke, and Wood (2013) conducted a meta-analysis of 14 articles that reported age differences in mean levels of the Big Five personality traits, collectively spanning ages 10–20. The trajectory of conscientiousness was best described by a U-shaped pattern: Mean levels of conscientiousness decreased from age 10 to 13 and then increased from age 14 and up. That common trajectory supports the idea that factors working against conscientiousness are more prominent in earlier adolescence, and factors supporting its development are more prominent later.

Two large-scale studies not included in this meta-analysis both replicated the U-shaped average trajectory for conscientiousness but also tested for gender differences. In a large cross-sectional study, Soto, John, Gosling, and Potter (2011) found that the positive age trend in later adolescence was more pronounced for females than for males, such that by emerging adulthood, females were slightly more conscientious than males. In a longitudinal study, Van den Akker, Dekovic, Asscher, and Prinzie (2014) did not find evidence for gender differences in the development of child-reported conscientiousness. In light of this difference between a larger cross-sectional study and a smaller longitudinal one, the issue of gender differences remains somewhat open and would benefit from further data.

1.2. Changes in conscientiousness and changes in academic, health, and relationship variables

Moving beyond average change trajectories, a next set of questions revolves around the antecedents and consequences of change: Why does conscientiousness develop in this way and what implications do such changes have for adjustment and well-being? Experimental evidence could provide strong evidence about causality. However such studies, while not completely impossible, would be prohibitive on practical grounds at this early stage in the field. Observational evidence may be a useful earlier step to identify promising variables to target in later intervention studies.

Therefore, as a starting point we set out to investigate correlated changes to see what variables are changing in tandem with changes in conscientiousness. Such an approach capitalizes on individual differences in the rate of change: Some individuals may be growing faster or slower than average in conscientiousness, and correlated-change analyses examine whether those same individuals are also growing faster or slower than average in other domains (Duncan, Duncan, & Strycker, 2006). Although this approach cannot directly address causality, it can be a useful initial step by indicating what other changes go hand-in-hand with changes in conscientiousness.[2]

We focused our investigation on three domains: Academics, health, and relationships. Few previous studies have looked at correlated change between conscientiousness and these domains in childhood and adolescence (for exceptions, see De Bolle, Beyers, De Clercq, & De Fruyt, 2012; Van den Akker et al., 2014). But these are domains where previous research has identified either cross-sectional associations or predictive associations between levels of conscientiousness and levels of these variables (e.g., Duckworth & Seligman, 2005; Friedman et al., 1995; Ozer & Benet-Martinez, 2006). Thus we considered them promising areas to investigate correlated change.

1.2.1. Conscientiousness and academics

Conscientiousness has a well-established relationship with academic performance among college students (Noftle & Robins, 2007). Among children and adolescents, conscientiousness-related traits, such as self-discipline and the ability to delay gratification, also predict academic success, including higher academic competence (Mischel, Shoda, & Peake, 1988), better grades (Duckworth & Seligman, 2005), and higher SAT scores (Shoda, Mischel, & Peake, 1990). Conscientiousness is also associated with school engagement – that is, with behaviors that tend to lead to better grades. For example, eighth-grade students high in self-discipline spend more time on their homework compared to more impulsive students (Duckworth & Seligman, 2005). Further, not only is conscientiousness positively related to the amount of time spent in class (Mehl, Gosling, & Pennebaker, 2006), but conscientious people are more likely to complete school assignments on time and come to classes prepared (bringing pens and paper) compared to their less conscientious peers (Jackson et al., 2010). In the present study, we therefore examined whether changes in conscientiousness from late childhood through middle adolescence were associated with changes in grades, time spent on homework, and school engagement behaviors like coming to class prepared and demonstrating an interest in learning.

Children and adolescents spend more time in schools than in any other place outside their homes (Eccles & Roeser, 2009); therefore, it is not surprising that the educational environment has the potential to influence children's developing personalities. Changes in the supportiveness of the school environment as well as academic support from parents may be important for the development of conscientiousness. Although it is normative for such support to decrease as adolescents become more autonomous (Eccles & Roeser, 2009), a too-precipitous decline may be problematic. We therefore examined how changes in the school climate

[2] Some longitudinal analysis methods, such as lagged-effects models, are able to identify causal parameters conditional on certain assumptions. We did not pursue such a strategy because we were not confident that those assumptions would hold in the present data. For example, lagged-effects models work best when the interval between measurements is equal or less than the time course of the underlying causal process (Finkel, 1995). With a three-year interval in the present study, we were not willing to make such an assumption.