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Personality development and adjustment in college: A multifaceted, cross-national view

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Personality development and adjustment in college: A multifaceted, cross-national view

Abstract

The current study is among the first to examine rank-order stability and mean-level change across college in both broad Big Five personality trait domains (e.g., Neuroticism) and the narrower facets underlying these domains (i.e., self-reproach, anxiety, and depression). In addition, the current study tests longitudinal associations between Big Five domains and facets and three aspects of adjustment: self-esteem, academic adjustment, and social adjustment in college. Specifically, the study examines co-development (correlated change), personality effects on later changes in adjustment, and adjustment effects on later changes in personality. Two large longitudinal samples from different countries were employed. Results suggested that rank-order stabilities of facets were generally large (i.e., $>.50$) across samples, and comparable to those observed for trait domains. Mean-level findings were largely in line with the maturity principle: levels of neuroticism and (most of) its facets decreased, whereas levels of the other domains and facets were either stable or increased. However, patterns sometimes slightly differed between facets of the same trait domain. All three types of longitudinal associations between personality and adjustment were found, but unlike mean-level change often varied by facet. The Extraversion facet of positive affect and the Conscientiousness facets of goal-striving and dependability were positively associated with all three adjustment indicators in both samples, whereas the Neuroticism facets of depression and self-reproach were consistently negatively associated with adjustment. In sum, our findings demonstrate that considering Big Five trait facets may be useful to reveal the nuanced ways in which personality develops in tandem with adjustment in college.

Keywords: personality facets, self-esteem, college adjustment, personality development, young adulthood

Personality development and adjustment in college: A multifaceted, cross-national view

Introduction

Young adulthood is the period during the lifespan characterized by the largest, most pervasive, and most positive mean-level trait changes (Roberts, Walton, & Viechtbauer, 2006); the typical person's personality improves substantially across these years. On the other hand, young adulthood typically shows the lowest rank-order stability of traits of any period in adulthood (Ferguson, 2010; Roberts & DelVecchio, 2000); this suggests the presence of larger individual differences in change during this period than occur later on. Clearly, the college years are a dynamic period, but there is still very little knowledge on what specifically changes within lower levels of the personality trait taxonomy. This is because previous research has focused largely on traits at the domain level, which comprises broad trait constructs such as Conscientiousness that subsume an extensive set of attributes which are related to each other (i.e., tendencies to be planful, orderly, responsible, and reliable; Caspi, Roberts, & Shiner, 2005). However, hierarchically beneath these domains lie facets, which are narrower traits that incorporate a tighter set of behavioral referents (Hampson, John, & Goldberg, 1986). So, for example, a facet¹ underlying Conscientiousness might specifically tap into orderliness. Facets are important to study because they capture important nuances of feelings, thoughts, and behavior that may be lost at the domain level, and sets of facets may not all change in the same way as their overarching domain. Therefore, the first aim of our study is to provide more specificity to previous findings on mean-level change and rank-order stability by examining change not only in terms of broad traits but also facets, by tracking samples from two different countries across the entirety of college.

Importantly, traits are also associated with differential life outcomes (Ozer & Benet-Martinez, 2006)—in domains such as interpersonal relationships (Back, 2015), academics (Vedel, 2014), work (Judge, Heller, & Mount, 2002), and health (Bogg & Roberts, 2004).

Studying facets in this context is important as well, because they typically offer improved prediction over broader domains (Paunonen & Ashton, 2001). One way that researchers have attempted to gain a broad understanding of life outcomes specifically in college has been to study types of adjustment. Hence, the second aim of the current paper is to increase understanding of personality development by examining the longitudinal interplay between trait domains and facets and adjustment. We consider adjustment within two specific but important college contexts, social life and academics, in addition to general self-esteem; we define these in the section below on adjustment.

A Rare, Multifaceted Approach to Personality Development

Although many researchers consider the Big Five trait domains as the preferred way to capture the domain-level structure of personality, there is considerably less agreement on the structure of personality at the facet level. Some instruments, such as the new Big Five Inventory-2 (BFI-2; Soto & John, 2017) distinguish three facets per Big Five trait domain, whereas others assess up to six facets per domain (e.g., the NEO-PI-R; Costa & McCrae, 1992). In addition, facets within different instruments and from different sources do not always map on to each other; for example, lexically-derived facets of Saucier and Ostendorf (1999) do not fully map onto the NEO-PI-R facets (see Table 4.3 in John, Naumann, & Soto, 2008). In the current study, we focus on the 14 facet scales developed for the NEO-FFI (Chapman, 2007; Saucier, 1998), which is a shortened version of the NEO-PI-R (Costa & McCrae, 1992). These facets are listed and defined in Table 1.

<Insert Table 1 about here>

Using the NEO-FFI facets, our first research aim is to refocus questions about mean-level change and rank-order stability to the facet level of analysis. Until now, very little work has tracked facets longitudinally, and the small extant literature suggests facets under the same domain may develop in heterogeneous ways (e.g., Soto & John, 2012). However,

because there are few studies on facet change, it is still possible that facets may not add much to our understanding of personality development. Conversely, it is also possible that a facet-level analysis of trait change will provide a more nuanced picture of personality development.

Mean-Level Change and Rank-Order Stability in College and Young Adulthood

Two types of change and continuity are often distinguished in studies of personality development. These are mean-level change and rank-order stability (Caspi et al., 2005). Specifically, mean-level change is about whether the average person in a sample increases, decreases, or stays the same on a trait. In contrast, rank-order stability is a question about the differential consistency of change in a sample: whether people change in similar ways across time or change differently.

Mean-level change. Roberts et al.'s (2006) meta-analysis demonstrated that young adulthood was a dynamic period brimming with change. Specifically, college-aged young adults (i.e., typically ages 18-22) showed increases of a medium effect size in Extraversion and Openness and decreases of a small size in Neuroticism, but there were only very small increases in Conscientiousness and Agreeableness. Similarly, a later large-scale four-year longitudinal study of over a thousand students entering college (Lüdtke, Roberts, Trautwein, & Nagy, 2011) showed increases of a small effect size in Extraversion and Openness, and decreases of a medium size in Neuroticism. However, this same study actually found increases of a medium size in Agreeableness and Conscientiousness (also see Vaidya, Gray, Haig, Mroczek, & Watson, 2008), traits that were not found to change until later in young adulthood in the Roberts et al. meta-analysis. What is clear across studies is undisputable evidence for the college period as a time of considerable mean-level change in personality trait domains despite only extending across about four years. Some of these changes, like that of increasing Openness, are in accordance with Arnett's (2000) theory of emerging adulthood, which regards the period as one of exploration, volition, and identity pursuits. On the other

hand, most of these changes reflect greater maturity, and are therefore in accordance with the maturity principle of personality development (Roberts & Wood, 2006). However, the maturity principle does not necessarily regard all increases in Extraversion as indicative of maturity, as facet-level increases in social dominance are construed as a component of maturity, but increases in social vitality are not.

Interestingly, when Roberts et al. (2006) broke Extraversion down into social dominance and social vitality, college-aged students showed a medium increase in social dominance and a small but significant increase in social vitality. After the college years, young adults continued to exhibit a similar increase in social dominance, but they actually showed a small *decrease* in social vitality (Roberts et al., 2006). Such findings highlight the importance of tracking developmental trends at the facet level to provide a thorough test of theoretical principles such as the maturity principle. If Extraversion would have been examined at only the domain level, important changes toward maturity may have been overlooked. Roberts and colleagues did not examine facets for the other four traits, but it is possible that examination of such facet-level changes may reveal important nuances to the current domain-level-based knowledge about how personality develops. For example, although Openness at the domain level is not typically considered relevant to maturity, facets with contemplative or intellectual content might indeed be indicative of greater maturity whereas facets having to do with unconventionality would not. Supporting this idea, Terracciano, McCrae, Brant, and Costa (2005), also found some longitudinal patterns which differed across facets of the same domain (such as Openness), although their sample constituted mostly middle-aged and older adults.

There appear to be only two longitudinal studies that have studied facet changes in young adulthood (Mund & Neyer, 2014; Soto & John, 2012). Mund and Neyer's study followed young adults from their mid-20s across 8 years, using the same NEO-FFI measure

employed in the current study, but they did not examine Openness facets. (The NEO-FFI facets are described in Table 1.) For Extraversion, they found that sociability and activity decreased but that positive affect increased. For Agreeableness, both facets of non-antagonistic orientation and prosocial orientation increased. For Conscientiousness, goal-striving and orderliness increased somewhat but increases in dependability were much stronger. For Neuroticism, bothⁱⁱ facets decreased, but negative affect more strongly than self-reproach. Unlike Mund and Neyer, Soto and John tended to find more differentiated patterns of facet-level change within trait domains. However, they used a different measure of personality and followed young adults until their early 60s. For Extraversion, Soto and John found that gregariousness (related to social vitality and sociability) decreased, whereas assertiveness (related to social dominance) increased. For Conscientiousness, self-discipline (related to goal-striving) and industriousness increased, but orderliness did not change. For Neuroticism, depression and rumination decreased whereas anxiety did not change. Finally, for Openness, adventurousness decreased, but facets of idealism (related to aesthetic interests) and intellectualism (related to intellectual interests) did not change. Only for Agreeableness, did all three facets change in a very similar way: trustfulness and compassion (both related to prosocial orientation), and humility all increased. It should be noted that both studies examined the post-college years into middle age instead of the college period. At the trait domain level, different patterns are found during college than later in young adulthood (e.g., Roberts et al., 2006), so this could suggest that at the facet level the college years could also show different patterns than those of these post-college studies. In sum, it appears that, aside from Extraversion facets, the facets of each Big Five domain tend to differ in only the magnitude rather than the direction of change, but given the scant literature on the topic, it is an open question whether further longitudinal studies will find this as well.

However, similar findings were obtained in three fairly recent cross-sectional studies examining age differences across young adulthood (Jackson et al., 2009; McCrae et al., 2004; Soto, John, Gosling, & Potter, 2011), with exceptions for two Big Five traits. For Neuroticism, findings for depression were diffuse, with McCrae et al. (2004) reporting a mixed pattern of stability and decreases with age, and Soto et al. (2011) reporting some increases with age. In addition, for Openness findings for the facet of ideas were not replicated, with increases in ideas in young adulthood reported by Soto et al. (2011), but age-related decreases reported by McCrae et al. (2004).

Rank-order stability. Individual differences in personality traits tend to be retained across time in young adulthood, including the college years. Previous research (Ferguson, 2010; Roberts & DelVecchio, 2000) has demonstrated that rank-order stability in this period in the lifespan is large, ranging from .51 to .57 ($\approx .70$, when corrected for measurement error). However, rank-order stability in young adulthood is typically lower than in the rest of adulthood, where it is very large, ranging from .59 to .75 ($> .80$, when corrected for measurement error). Together with the mean-level trait change findings, this suggests that young adulthood, and thus the college period, is a time of dynamic changes that differ somewhat across individuals. At the trait level, this previous research found that the magnitude of stability was quite similar across the Big Five trait domains. The very little research that has examined the rank-order stability of facets suggests that facets may have lower magnitudes of stability than the domains. In a study of midlife adults, Costa, Herbst, McCrae and Siegler (2000) found 6 to 9 year rank-order stabilities ranging from .66 to .80 for the 30 facets of the NEO-PI-R, whereas stability of the domains ranged from .76 to .84. In a very heterogeneous sample in terms of age (18 to 59 years at the first measurement occasion), Bleidorn, Kandler, Riemann, Angleitner, and Spinath (2009) obtained similar findings. They found 5-year rank-order stabilities of the NEO-PI-R facets ranging from .60 to .79, whereas

stabilities for the domains ranged from .76 to .83. In the only sample including a group of young adults (starting in their mid-20s), Mund and Neyer (2014) found rank-order stabilities across eight years ranging from .43 to .76 for the NEO-FFI facets and from .56 to .69 for the domains. In sum, stabilities for facets appear to be both more heterogeneous and slightly lower than stabilities for the broader domains.

Thus, only two longitudinal studies have examined change and continuity in Big Five facets in young adulthood (Mund & Neyer, 2014; Soto & John, 2012)—and neither study took place during college. There are several reasons why there are so few studies. First, as we already mentioned, there is little consensus on the lower-order facet-level structure of personality traits. Second, there are few facet-level measures of the Big Five. The NEO-PI instruments (Costa & McCrae, 1992; McCrae, Costa, & Martin, 2005) are the most popular measures of the Five-Factor Model, and include 30 facets. However, these measures are proprietary and expensive to use and thus have not received as much use in research settings (e.g., see Table 1 in Roberts et al., 2006). Third, assessing Big Five facets thoroughly is time intensive, because most facet-level measures include at least 100 items rather than the few dozen required to assess the Big Five domains adequately. This cost is magnified in longitudinal work using multiple trait assessments.

However, there are now possibilities for measuring personality at the facet-level with much shorter measures. For example, facet-level scales have been developed for the 44-item Big Five Inventory (Soto & John, 2009), the new 60-item BFI-2 (Soto & John, 2017), and the 60-item NEO-FFI (Chapman, 2007; Saucier, 1998). As we mentioned before, studying facets is important because they contain trait-specific variance that is not captured by the overarching trait domain (Paunonen & Ashton, 2001). For example, with the NEO-FFI it has been shown that specific facets of Extraversion (i.e., positive affect), Agreeableness (i.e., non-antagonistic orientation), and Conscientiousness (i.e., orderliness) negatively predicted

delinquency, whereas delinquency was not predicted by their overarching trait domains (Klimstra, Luyckx, Hale, & Goossens, 2014). Thus, facets might not only show different developmental patterns but also add incrementally to the prediction of relevant outcomes.

Longitudinal Associations Between Personality Traits and Adjustment

To examine why and how (facet-level) personality change might matter, as our second aim we will examine the association between personality change and psychological adjustment in college. College life is challenging in at least two main contexts. First, it is socially challenging, because students typically need to make new friends and are often living outside the parental home for the first time. Second, the learning environment is also new and different, as the relative comfort of the small high school classroom is often traded for bigger lecture halls. Moreover, classes are more challenging and there is more of an emphasis on studying autonomously. Thus, in the present study, we will delineate two components which capture these typical challenges: social adjustment and academic adjustment. Several studies have distinguished these core adjustment components (e.g., Baker & Siryk, 1984, 1986; Credé & Niehorster, 2012). In such studies and in the present context, *social adjustment* reflects the interpersonal aspect of the college experience, referring to establishing and maintaining friendships. *Academic adjustment* refers to the ability to keep up with educational demands, motivation towards academic work, and enjoyment of the educational aspect of the college experience. Baker and Siryk's (1984) complete model of the four components of adjustment also includes personal-emotional adjustment and institutional adjustment. However, the latter type of adjustment is about one's identification and satisfaction with a specific college and thus appears less relevant to personality development. Therefore, we will focus on only a third aspect of adjustment, personal-emotional adjustment, as reflected in self-esteem. In Credé and Niehorster (2012) meta-analysis, self-esteem was the second most highly related correlate of personal-emotional adjustment ($\rho = .56$), just behind depression, suggesting considerable but

not perfect overlap between the constructs. *Self-esteem* reflects an overall evaluation of one's worth and positive versus negative feelings about the self (e.g., Orth, Robins, & Roberts, 2008; Robins, Hendin, & Trzesniewski, 2001). It is a useful indicator of psychological adjustment, and demonstrated to be a protective factor against depression (Orth et al., 2008).

Altogether, these three adjustment components are linked to a large array of life outcomes both in college and later in adulthood (Baker & Siryk, 1986; Crede & Niehorster, 2012; Trzesniewski et al., 2006). For example, these adjustment measures predict higher college grades, college completion, social support, quality of one's relationship with parents, coping, and depressive symptoms. In addition, all three adjustment components are related to self-efficacy (Judge, Erez, & Bono, 1998; Njus & Brockway, 1999). Beyond the immediate college setting, both academic and social components of adjustment also theoretically connect directly to focal developmental tasks of the first segment of young adulthood: positioning oneself for entering the workforce and forging a social network for both friendship and romantic pursuits (Hutteman, Hennecke, Orth, Reitz, & Specht, 2014). Thus, social and academic adjustment to college and self-esteem are likely key factors in college students' current and future functioning. Examining how personality trait domains and facets develop and how they are associated with these three aspects of adjustment over time will clarify the role of traits in the college context.

Several models are possible to describe longitudinal associations between personality traits and adjustment. Our analysis focuses on three types of associations that we refer to as *co-development effects*, *personality effects*, and *adjustment effects* (cf. Neyer & Asendorpf, 2001). Co-development effects (correlated changes) refer to common changes across personality and adjustment when initial associations, the stabilities of each variable (i.e., autoregressive paths), and directional effects over time between personality and adjustment are taken into account. Personality effects refer to the direct effect of personality on later

changes in adjustment. Finally, adjustment effects refer to the direct effect of adjustment on later changes in personality. Both personality and adjustment effects are cross-lagged effects controlling for initial associations between personality and adjustment and autoregressive paths of both constructs. (Also included in our models are initial associations, which we do not discuss in the paper due to our current focus on change, but are included in the supplementary materials in Section D, Table I.) See Figure 1 for a depiction of these effects.

Personality traits have been identified as major predictors of the current three aspects of adjustment. However, self-esteem, social adjustment, and academic adjustment could also affect personality trait development, or develop in parallel with personality traits. For example, having high levels of the Extraversion facet of positive affect, therefore acting cheerful, enthusiastic and optimistic, might facilitate formation of new friendships, shifting one relatively higher in social adjustment in college. Correspondingly, being higher in social adjustment might further increase trait positive affect, as social bonding with increasing numbers of friends may contribute to even more commonly experienced positive emotions. Few studies examining associations between these adjustment indicators and personality have employed a longitudinal design which would allow for examining co-development effects, personality effects, and adjustment effects simultaneously. Importantly, and furthermore, there are likely to be mechanisms that help to explain the longitudinal associations between personality and adjustment; we return to this topic in the discussion section. Below we discuss the available literature for each of the three aspects of adjustment.

Self-esteem. Several large-scale cross-sectional studies have examined associations between the Big Five and self-esteem. These studies (e.g., Erdle, Gosling, & Potter, 2009; Robins, Hendin, & Trzesniewski, 2001; Robins, Tracy, Trzesniewski, Potter, & Gosling, 2001) generally found medium to large positive associations of self-esteem with Conscientiousness and Extraversion, and large negative associations with Neuroticism.

Agreeableness and Openness also were positively associated with self-esteem, but these associations tended to be small.

However, few studies have examined the linkages between Big Five personality and self-esteem longitudinally. Erol and Orth (2011) found that the Big Five were related to self-esteem concurrently but did not predict change in self-esteem. Lönnqvist, Verkasalo, Makinen, and Henriksson (2009) found that Neuroticism predicted lower self-esteem from age 20 to 35, but the effect in the opposite direction was not examined. However, Wagner, Lüdtke, Jonkmann, and Trautwein (2013) found that a more favorable personality profile (i.e., low Neuroticism, high levels of the other four traits) *did* predict increases in self-esteem. There appear to be few, if any, studies that simultaneously examined models of co-development effects, personality effects, and adjustment effects to disentangle the longitudinal associations between the Big Five and self-esteem. In addition, to our knowledge, no studies have examined personality trait facets and self-esteem.

Social and academic adjustment to college. Credé and Niehorster (2012) conducted a meta-analysis that showed associations between the Big Five and social and academic adjustment. For social adjustment, their meta-analysis showed medium to large negative associations with Neuroticism, but also medium positive associations with Extraversion, Agreeableness, and Conscientiousness. In one of the few longitudinal studies linking personality to social (and academic) adjustment, Robins, Nofle, Trzesniewski, and Roberts (2005) found that a related construct, social orientation, was only related to increases in Extraversion. This effect of Extraversion was replicated in one prospective study (Kurtz et al., 2012), but not in another one (Okun & Finch, 1998). Both these studies did find prospective effects of Neuroticism on social adjustment, but prospective effects of other Big Five traits were either non-significant or not replicated across studies.

In the aforementioned meta-analysis (Credé & Niehorster, 2012), academic adjustment showed large positive associations with Conscientiousness, medium positive associations with Agreeableness, and medium negative associations with Neuroticism (see also Schnuck & Handal, 2011). In Robins et al.'s (2005) longitudinal study, both levels and changes in mastery response (which conceptually overlaps with academic adjustment) were associated with increases in Agreeableness and Conscientiousness. On the other hand, having higher levels of (maladaptive) performance-oriented academic goals was associated with increases in Neuroticism. Conscientiousness and Neuroticism also have been found to prospectively predict academic adjustment at the end of the first year (Kurtz, Puher, & Cross, 2012). Although Openness is among the stronger trait predictors of academic performance (Nofle & Robins, 2007; Poropat, 2009; Vedel, 2014), findings regarding the relation between Openness and academic and social adjustment are mixed. This could be due to differential prediction at the facet level.

Thus, despite the rich literature on personality and academic performance (e.g., Vedel, 2014), there is a dearth of longitudinal research linking personality to social and academic adjustment in college. Moreover, the few extant studies only examine personality effectsⁱⁱⁱ, while ignoring the possibility of adjustment effects and co-development effects.

The Present Study and Hypotheses

The present study uses two longitudinal datasets with samples of US college students and Belgian college students to pursue our primary aims: charting development in domains and facets and examining transactions between personality and adjustment.

Regarding personality development, we examine both rank-order stability and mean-level change in domains and facets. Based on previous research in midlife (e.g., Costa et al., 2000), we expect somewhat lower rank-order stability for personality facets than for personality domains. Based on prior research, and generally in line with the maturity principle

of personality development (Roberts & Wood, 2006), we expect to find mean-level decreases in Neuroticism and increases in three of the other four Big Five factors: Agreeableness, Conscientiousness, and Openness. However, Extraversion, as measured with the NEO-FFI, mainly seems to represent social vitality rather than social dominance (see Saucier, 1998). As the magnitude of change in social vitality is very small in the college period (Roberts et al., 2006), we expect little to no changes in Extraversion in our study. For Agreeableness, we expect both facets to increase. For Conscientiousness, we expect levels of orderliness to increase, but we expect goal-striving and dependability to increase more strongly. For Neuroticism, anxiety is expected not to change, whereas depression is expected to decrease. For Openness, we have no specific facet-level hypotheses due to the previous mixed findings.

Previous research on the longitudinal associations between personality facets and psychopathology found evidence for co-development effects (e.g., De Bolle, Beyers, De Clercq, & De Fruyt, 2012; Klimstra et al., 2014), so we also expect these effects for personality and adjustment. In addition, we expect directional effects between personality and adjustment. Previous studies appear to have only examined personality effects but not adjustment effects. However, adjustment effects have been reported alongside personality effects in longitudinal research linking personality to subjective well-being (Soto, 2015). Therefore, such effects may likely also be exerted by other adjustment indicators. Thus, based on previous research, we expect to find the most evidence for co-development effects, followed by personality effects, and finally by adjustment effects.

Based on the previously discussed research, we expect several *specific* connections between individual traits and aspects of adjustment. First, we expect self-esteem to be more strongly associated with Extraversion, Conscientiousness, and Neuroticism, and more weakly with Agreeableness and Openness. Second, both academic adjustment and social adjustment to college are expected to be associated with Agreeableness, Conscientiousness, and

Neuroticism. Third, social adjustment—but not academic adjustment—is expected to be associated with Extraversion. In general, academic adjustment is expected to be most strongly associated with Conscientiousness, whereas social adjustment is expected to be the most strongly associated with Extraversion. Because of the rather limited literature on personality facets, we cannot provide well-informed specific hypotheses regarding these facets. However, we expect facets belonging to the same trait domain to not always be similarly associated with particular adjustment measures. For example, within the Extraversion domain sociability is more likely to be associated with social adjustment than positive affect is, whereas within the Openness domain it seems likely that intellectual interests rather than unconventionality might be more associated with academic adjustment. However, these latter two predictions are merely based on common sense and should not be regarded as formal hypotheses.

Method

Ethics Approval

Data collection for Sample 1 was initiated in 1992 after gaining approval from the Institutional Review Board of the University of California, Berkeley. Data collection for Sample 2 was initiated in 2002. By then, the KU Leuven (and most other universities in Belgium and The Netherlands) did not yet have a formal Institutional Review Board. Therefore, all non-medical research did not require ethical approval. However, data collection procedures were in line with the standards proposed in the 1964 Helsinki declaration and its later amendments.

Participants and Procedure

Participants in Sample 1 were drawn from the Berkeley Longitudinal Study (BLS), a longitudinal study designed to examine the development of self-esteem and personality during college (for further details about the study, see Robins, Hendin, & Trzesniewski, 2001; Robins et al., 2005). Several papers using the personality data of this study have been

published previously (e.g., Nofle & Robins, 2007; Roberts, O'Donnell, & Robins, 2004; Roberts & Robins, 2000; 2004; Robins, Fraley, Roberts, & Trzesniewski, 2001; Robins et al., 2005). However, none of these papers examined personality traits at the facet level. In addition, several papers examining self-esteem have been published from this data set (e.g., Chung et al., 2014; Orth, Robins, & Roberts, 2008; Robins, Hendin, & Trzesniewski, 2001), but these studies have not examined personality change as a covariate. Finally, several papers examining social and academic variables have been published from the data set (e.g., Chung, Schriber, & Robins, 2016; Robins & Beer, 2001; Robins & Pals, 2002). However, only one study from the data set has examined how such variables covary with personality trait change at the domain level (Robins et al., 2005), and it did not examine social and academic adjustment per se or facet-level correlates.

Participants in Sample 1 were recruited during the first week of their first year of college in 1992, and then assessed annually throughout college. Participants were contacted by mail and asked to complete an extensive questionnaire in exchange for financial compensation. Six assessments were conducted over a 4-year period: first week of college ($N = 508$); end of the first semester ($N = 455$); and end of the first ($N = 306$), second ($N = 260$), third ($N = 200$), and fourth ($N = 303$) years of college. The NEO-FFI personality measure was administered only during the first week of college and at the end of the fourth year (at the latter time point 41% of the participants who completed it the first time were missing). Our analyses focused on a subsample of participants ($N = 295$) who completed the personality measures at both assessments. We analyzed personality and adjustment differences at the beginning of college between participants who remained in the study and those who later dropped out. We found that non-participants (np; vs. participants, p) were significantly lower on Conscientiousness ($M_p = 3.53$; $M_{np} = 3.30$, $p < .001$, Cohen's $d = .40$) and all three of its facets (Dependability $M_p = 3.80$, $M_{np} = 3.54$, $p < .001$, Cohen's $d = .38$; Goal-Striving $M_p =$

3.86, $M_{np} = 3.62$, $p < .001$, Cohen's $d = .33$; Orderliness $M_p = 3.13$, $M_{np} = 2.92$, $p = .002$, Cohen's $d = .29$), and slightly higher on the Intellectual Interests facet of Openness ($M_p = 3.74$; $M_{np} = 3.89$; $p = .046$, Cohen's $d = .19$) at the beginning of college. There were no significant differences between participants and non-participants on the three adjustment indices at the beginning of college. In terms of demographic information, Sample 1 ($M_{age} = 18.39$ years) was diverse in terms of ethnicity (43% Asian, 36% Caucasian, 12% Chicano/Latino, 5% African American, 4% Missing/Other/Multiracial), sex (60% female), socioeconomic status (20% came from families with 1992 household incomes below \$25,000 and 17% from families with household incomes above \$100,000), and academic ability (combined verbal and math SAT scores ranged from 650 to 1530, $M = 1194$, $SD = 173$).

Participants in Sample 2 were drawn from the Leuven Trajectories of Identity Development Study (L-TIDES; Luyckx, Goossens, & Soenens, 2006), a 7-wave longitudinal study of college students from a large Belgian university. Several papers using the personality data of this study have been published previously. However, generally these studies did not examine personality facets (Klimstra, Luyckx, Branje, Teppers, & Goossens, 2013; Klimstra, Luyckx, Germeijs, Meeus, & Goossens, 2012; Klimstra, Luyckx, Hale, Goossens, & Meeus, 2010; Luyckx, Soenens, & Goossens, 2006). The one study that did examine personality facets (Klimstra et al., 2014) did not focus on mean-level change and did not examine associations of personality domains and facets with self-esteem, and social and academic adjustment to college.

The first wave of Sample 2 was collected in 2002, and data on both personality and adjustment (i.e., self-esteem, social adjustment, and academic adjustment) were available for four measurement occasions. Consequently, these four waves were used for the present study. There was a one-year interval between each of these four measurement occasions. Hence, a total time span of 3 years was covered. At Time 1, a total of 565 individuals participated. In

line with previous studies on this dataset, only individuals who participated in at least two out of four measurement waves ($N = 485$; 87.4% female; $M_{age} = 18.63$ years, $SD = 0.61$) were included. We followed this procedure, because we do not consider individuals who only provide one data point to be part of our longitudinal sample. Compared to the 485 individuals (participants, p) that were included, the 80 individuals that were not included (the non-participants, np) scored significantly lower on academic adjustment ($M_p = 3.11$; $M_{np} = 3.28$, $p = .038$, Cohen's $d = .18$), on the domain score of Conscientiousness ($M_p = 3.42$; $M_{np} = 3.29$, $p = .024$, Cohen's $d = .19$), and on the Conscientiousness facet orderliness ($M_p = 3.01$; $M_{np} = 3.22$, $p = .007$, Cohen's $d = .23$). The university where study was conducted mainly attracts white/Caucasian students from middle class families.

As in many longitudinal studies, data were missing at different time points for different participants. In Sample 1, 15.9% and 25.8% of the data were missing for the first year assessment when academic and social adjustment, respectively, were assessed (for more details, see Robins & Beer, 2001). In Sample 2, 14.4% of the data were missing for the 485 participants. We did not impute missing data for Sample 1, as it comprised two waves of data. However, for Sample 2, as it consisted of four waves, we checked whether we could still include cases with missing values in our analyses. There was no evidence for biases in our data due to attrition, as Little's Missing Completely At Random (MCAR) Test (Little, 1988) revealed a normed χ^2 (χ^2/df) of 1.15. According to guidelines by Bollen (1989), this ratio indicates that values were missing at random. Therefore, we used Full-Information Maximum Likelihood (FIML) estimation in our structural equation models.

Measures

Personality traits. Participants completed the 60-item NEO Five-Factor Inventory (NEO-FFI; Costa & McCrae, 1992) in Sample 1 and the Dutch version of the same instrument (Hoekstra, Ormel, & De Fruyt, 1996) in Sample 2. This instrument uses a five-point scale

(1=strongly disagree, 5=strongly agree) and was originally developed to assess the Big Five domains (i.e., Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness), but facets underlying these domains can also be distinguished (Chapman, 2007; Saucier, 1998). These facets are distinctive within personality domains, as facets belonging to the same domain correlated .49 (range .20, .63) and .45 (range .22, .66) with each other in Sample 1 and Sample 2, respectively (see Supplementary Material Section A, Table II). All facets are described in Table 1. Most of the scales showed adequate internal consistency, with a few exceptions (See Section A, Table I of the supplementary material).^{iv}

Self-esteem. Participants completed the 10-item Rosenberg (1965) Self-Esteem Scale (RSE) in Sample 1 and the Dutch version of the same instrument (Van der Linden, Dijkman, & Roeders, 1983) in Sample 2. Responses were made on a 5-point rating scale (ranging from “not very true of me” to “very true of me”) in Sample 1 and a 4-point rating scale (ranging from “does not apply to me at all” to “applies to me very well”) in Sample 2.

Social and academic adjustment to college. Different measures were used to assess social and academic adjustment across the two samples, but we developed parallel measures from existing items collected in Sample 1 to match the standardized questionnaire assessed in Sample 2. In Sample 2, social and academic adjustment in college was assessed with a 20-item version of the Student Adaptation to College Questionnaire (SACQ; Baker & Siryk, 1984). Items were answered on a 5-point Likert-type rating scale (ranging from “strongly disagree” to “strongly agree”). The social adjustment subscale (10 items; e.g., “I am meeting as many people and making as many friends as I would like at my university”) measures how students deal with the interpersonal experiences at the university. The academic adjustment subscale (10 items; e.g., “Recently, I have had trouble concentrating when I try to study”) measures how students deal with the educational demands of their university.

Because we wanted to assess social and academic adjustment as similarly as possible across the two samples, we developed analog scales for SACQ social and academic adjustment within the Sample 1 dataset. Although previous research has investigated narrower components of social and academic adjustment in the BLS (Robins & Beer, 2001; Robins & Pals, 2002; Robins et al., 2005), we developed new scales for the current research from the fairly large available pool of social and academic items. The point was to develop scales that were as close to the SACQ scales as possible in order to be able to directly compare findings across samples. Scale development followed a four-step process: item identification, content mapping, psychometric testing and validation in a new sample, and final psychometric testing in the BLS.^v

In Sample 1, social adjustment was assessed using a composite of items, each assessed during Year 1 and Year 4 of college. For Year 1, most items were collected at the end of Year 1, but some items were collected in assessments earlier in the year. For Year 4, all were collected at the end of the year. Three items were included from the Adjustment to College scale (Aspinwall & Taylor, 1992): “How well do you think you've adjusted to the social environment at UC Berkeley?”, “Overall, how well do you think you've adjusted to college?”, and “Compared to the average freshman, how happy do you think you are?”. One item was included from the Quality of Interactions with the University scale (Robins et al., 2005): “How satisfied are you with your experience at the University?”. Responses for these four items were measured on 5-point scales. Three interpersonal items were included from the Center for Epidemiological Studies Depression Scale (Radloff, 1977): “I felt lonely”, “People were unfriendly”, and “I felt that people dislike me”. Participants were instructed to assess the frequency of their reactions within the preceding 7 days, and responses were measured on a 4-point scale (0 = rarely or none of the time, less than one day, 1 = some or a little of the time, one to two days, 2 = occasionally or a moderate amount of time, three to four days, and 3 =

most or all of the time, five to seven days). Finally, the item asking participants to rate the self “relative to other students: social skills/social competence” was included from the Self Attributes Questionnaire (Pelham & Swann, 1989), and was assessed using a 10-point scale.^{vi} After converting all items to a 5-point scale metric and reverse-coding relevant items, we formed 8-item composites for social adjustment for Year 1 and Year 4.

As with social adjustment, academic adjustment was assessed using a composite of items in Sample 1, each assessed during Year 1 and Year 4 of college. One item was included from the Adjustment to College scale (Aspinwall & Taylor, 1992): “How well do you think you've adjusted to the academic environment at UC Berkeley?” Two items from the Academic Effort scale (Nofle & Robins, 2007) were included: “How much effort have you been devoting to your school work this current semester in order to achieve the grades you hope for?”, and “On average, how many hours a week (outside of class time) have you spent on school work the current semester?”. Two items were included from the Approach-Avoidance Achievement Questionnaire (Covington & Omelich, 1991; Covington & Roberts, 1995): “I tend to demand less of myself in school than I know I am capable of” and “For me the joy of success in school outweighs the humiliation of failure”. One item was included from the Learning Goal Orientation scale (Robins & Pals, 2002): “The knowledge I gain in school is more important than the grades I receive”. Four items were included from the Mastery and Helpless Behavioral Response scales (Robins & Pals, 2002): “When something I am studying in school is difficult, I try harder”, “I feel that no matter how hard I work I can never do really well, so why bother trying?”, “I feel that very hard problems are not worth the effort of trying to solve them”, and “When I fail to understand something, I become discouraged to the point of wanting to give up”. After reverse-coding relevant items, we formed 10-item composites for academic adjustment for Year 1 and Year 4. A confirmatory factor analysis showed that the academic and social adjustment scales were distinguishable, as

a two-factor model with separate factors for social and academic adjustment ($\chi^2(78) = 135.482, p < .001; CFI = .923, RMSEA = .055$) fitted the data better than a one-factor model ($\chi^2(79) = 157.539, p < .001; CFI = .895, RMSEA = .063$).

We also ran a confirmatory factor analysis on the existing scale that we used in Sample 2. Similar as in Sample 1, also in Sample 2 a two-factor model ($\chi^2(157) = 475.200, p < .001; CFI = .903, RMSEA = .065$) fitted the data better than a one-factor model ($\chi^2(158) = 1026.885, p < .001; CFI = .734, RMSEA = .106$).

Measurement Invariance

Measurement invariance is a prerequisite for drawing reliable conclusions from comparisons of scores obtained with the same measure at different time points (e.g., van de Schoot, Lugtig, & Hox, 2012). Hence, we tested for longitudinal measurement invariance. In the context of the current paper, it was particularly relevant to test for metric invariance and scalar invariance (cf. Nye, Roberts, Saucier, & Zhou, 2008). Establishing metric invariance (i.e., an equivalent pattern of factor loadings across time) is sufficient when the goal is to compare associations across time, as is done in, for example, cross-lagged panel models. In order to provide meaningful mean comparisons with, for example, latent growth models, scalar invariance (i.e., an equivalent pattern of item intercepts) also needs to be examined.

Details on the measurement invariance tests we conducted are available as supplementary material (Section B). Overall, we found evidence for metric invariance, which implies that we were able to draw valid conclusions from cross-lagged panel models based on observed variables. We did not find evidence for full scalar invariance, but in such cases partial scalar invariance (i.e., with at least one of the intercepts constrained to be equal across time; Steinmetz, 2013) should be assessed. In the case of partial scalar invariance, it is no longer recommended to compare observed means, but latent means can still be compared across time (Steinmetz, 2013). Hence, we ran latent change models (in Sample 1) and latent

growth models (in Sample 2) based on latent variables for our constructs, which were indicated by the items that that we used to measure these constructs. Metric invariance and partial scalar invariance constraints imposed on the confirmatory factor analysis models for measurement invariance were also imposed on the latent change and latent growth models. Note that we did not find evidence for (partial) scalar invariance in the Neuroticism facet of self-reproach in Sample 1. Therefore, we did not assess mean-level change in self-reproach in Sample 1.

<Insert Table 2 about here>

Modeling Stability and Change and Personality-Adjustment Transactions across Time

Rank-order stability. We assessed rank-order stability coefficients for the latent variables of the Big Five domains and facets, and the three adjustment measures. Note that in Sample 2, we computed rank-order stability across adjacent measurement occasions (i.e., one-year time lags), and consequently the correlations appear to be slightly higher than those in Sample 1 which had a 4-year time interval between assessments. The Time 1-Time 4 correlations (i.e., 3 years apart) in Sample 2 were also examined, because these are more directly comparable to the rank-order stability coefficients obtained in Sample 1.

Mean-level change. In Sample 1, mean-level change in Big Five domains and facets, and the three adjustment measures was examined with latent change models (LCM; Hertzog & Nesselroade, 2003; McArdle & Nesselroade, 1994) to estimate differences between latent mean personality scores at Time 1 (Week 1 of university) and Time 2 (end of Year 4). Because Sample 2 included more than two waves of personality data, a different analytic approach was pursued. The main reason for not just using the first and last measurement occasion was that using more data points leads to more accurate change estimates (Willett, Singer, & Martin, 1998). Therefore, mean-level change in Big Five domains and facets and the three adjustment measures was examined with univariate Latent Growth Models (LGMs;

Duncan, Duncan, Stryker, Li, & Alpert, 1999) using Maximum Likelihood estimation in Mplus 7 (Muthen & Muthen, 2012). To facilitate the interpretability of the estimates derived from the LGMs, we used effects coding (Little, Sleger, & Card, 2006). This method estimates latent variables in a way that reflects the metric of the items that we originally used to assess personality and adjustment. To make the slopes/change factors across the two samples comparable in terms of the time scale they reflect, we put the factor loading of the second measurement occasion for the latent change factor at 4. Therefore, slope/change factors in both models represent the estimated amount of mean-level change across a 1-year period.

The fit of the models that we ran in both samples was judged by assessing the chi-square, the Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). According to common guidelines, the chi-square should be as small as possible, CFI should be larger than .90, and RMSEA should be smaller than .08 (Hu & Bentler, 1999; Kline, 2005). For Sample 1, CFIs of 11 out of the 21 models were $>.90$, whereas 6 models had a CFI between .85 and .90. Four models (the ones for orderliness, non-antagonistic orientation, self-esteem, and social adjustment) had a very poor fit with CFIs $<.85$. The 90% confidence intervals of the RMSEAs of the LCMs overlapped with the acceptable value of .08 in 15 of the 21 models (see supplementary material Section C, Table II). Thus, several LCMs fitted the data relatively poorly. Part of the reason for this may be that these models contain only two indicators for the latent level and latent change factors (e.g., a conscientiousness variable for Time 1 and another conscientiousness variable for Time 2). As latent variables are underidentified when they have less than 3 indicators (e.g., Little, Cunningham, Shahar, & Widaman, 2002), the part of our models at which the latent change and latent level factors were located was underidentified. Because of this, several constraints needed to be added to get the model as a whole identified. Adding constraints often worsens model fit.

For Sample 2, CFIs of 20 of the 22 models were $>.90$. Of those 20 models, only the ones for extraversion and conscientiousness had an RMSEA just above $.08$. The models for self-esteem and the openness facet of unconventionality had CFIs just below $.90$, but for those models, RMSEAs were well below $.08$. More details regarding the fit statistics of latent change and latent growth models are available in the supplementary material (Section C, Tables II and III).

Personality-adjustment transactions. As previously discussed, research on personality and adjustment has often neglected to correctly adjust for initial levels of adjustment in personality effects, and has tended to solely focus on these effects to the omission of adjustment effects and co-development effects. The present research used cross-lagged panel models (Burkholder & Harlow, 2003) to fully account for the three possible types of effects. Note that these models do not represent within-person effects (e.g., Berry & Willoughby, 2017; Hamaker, Kuiper, & Grasman, 2015). So, a positive prospective effect from Extraversion to self-esteem would not mean that a particular person's self-esteem is about to rise when their Extraversion is higher. Instead, cross-lagged effects are a blend of within-person and between-person effects, because the changes that are predicted in these models are relative rather than absolute changes (Neyer & Asendorpf, 2001). A positive prospective effect from Extraversion to self-esteem would thus mean that the higher up in the rank-order on Extraversion individuals are (i.e., if they are among the more extraverted in the sample), the more likely they are to ascend in the rank-order for self-esteem (e.g., move from being among the lowest 50% to being among the highest 50% on self-esteem). Similarly, positive co-development effects of Extraversion and self-esteem would not indicate that individuals who display absolute increases in Extraversion also tend to display absolute increases in self-esteem. Because the co-development effects drawn from cross-lagged models are correlations between residuals, they represent correlated relative change. This means that

positive co-development effects indicate that those who move up in the rank-order on Extraversion tend to be the same individuals who move up in the rank-order on self-esteem. Thus, the personality effects, adjustment effects, and co-development effects that we assess refer to relative changes.

Each of the models we tested included one Big Five domain or facet and one adjustment measure (see Figure 1). We used observed variables as input in these models, as measurement invariance tests pointed to full metric invariance for all constructs in Sample 2, and all adjustment measures, domain-level traits, and 11 out of 14 of facets in Sample 1 (see Section B of the supplementary material). In addition, using latent variables with items as indicators would have led to a very large number of parameters to be estimated in the four-wave cross-lagged panel models for Sample 2. Given the lack of evidence for full metric invariance for the Neuroticism facet of depression, the Agreeableness facet of non-antagonistic orientation, and the Conscientiousness facet of goal-striving in Sample 1, findings regarding these facets should be interpreted cautiously.

In Sample 1 there was only one time lag across the four years of the study, but in Sample 2 there were three time lags. To make the models of the Big Five dimensions and adjustment as parsimonious as possible, correlated relative change coefficients (i.e., T2, T3, and T4 correlations in Sample 2; e.g., Klimstra, Akse, Hale, Raaijmakers, & Meeus, 2010), cross-lagged paths from personality to adjustment, and cross-lagged paths from adjustment to personality were constrained to be equal across measurement waves.^{vii} Models for Sample 1 were all fully saturated, and therefore now meaningful fit statistics are available. The fit statistics of all final models in Sample 2 were adequate, with all CFIs $\geq .977$ and RMSEAs $\leq .079$ (see supplementary material Section C, Table I). In the following sections, we will discuss co-development effects (i.e., correlated change coefficients), personality effects (i.e., cross-lagged paths from personality to adjustment), and adjustment effects (i.e., cross-lagged

paths from adjustment to personality), respectively. It should be noted that our correlated change coefficients are associations between residual variances. Interpreting associations between residual variances in cross-lagged models as correlated relative change is common practice (see, for example, Neyer & Asendorpf, 2001 for an explanation).

Bivariate latent growth and latent change models provide an alternative approach to assessing correlated change (see results presented in the Supplemental material, Section D, Table II). Note that the bivariate growth models often did not lead to interpretable results, because the variance in the change (i.e., slope) factor was not significantly different from zero for one or both of the variables. Generally, statistical power to detect correlations between slopes is only moderate to low in latent growth models, even if the sample is large and the number of measurement occasions is up to 4 or 5 (Hertzog, Lindenberger, Ghisletta, & von Oertzen, 2006). Therefore, we chose to present results based on cross-lagged models, which indicate prospective effects of one variable on *relative* change in another. However, comparisons of the results based on cross-lagged models with those based on latent growth or latent change models were the same in terms of both direction (i.e., positive vs. negative) and statistical significance in 76% of the cases. When overlapping confidence intervals were considered as a criterion of replication, the modelling approaches replicated each other in 93% of the cases. In the other cases, the models we present in the current manuscript produced the smaller estimates of correlated change, suggesting that our results are thus more conservative estimates of correlated change.

Results

Rank-Order Stability

As hypothesized, Table 2 shows that we found considerable rank-order stability for both personality facets and domains; coefficients were all significant ($ps < .001$) and almost all large according to guidelines by Cohen (1992). Contrary to our expectations, Table 2

suggests that rank-order stability of personality facets was generally as high as rank-order stability of the overarching personality domains in both samples. Confidence intervals showed that this general rule did not apply to aesthetic interests in Sample 2. In addition, results from Sample 2 suggest that there were no systematic increases in rank-order stability in the college years. Finally, rank-order stability of our three adjustment measures (median correlations of $r = .62$ and $.59$ in Samples 1 and 2, respectively) were almost as high as rank-order stability of the personality domains and facets (median correlations of $r = .65$ and $.71$ in Samples 1 and 2, respectively). Unlike the rank-order stability for personality domains and facets, rank-order stability for the adjustment measures appears to increase over time. However, 95% confidence intervals of the T1-T2, T2-T3, and T3-T4 rank-order stability coefficients always overlapped, suggesting that these increases were not statistically significant (see supplementary material, Section A).

Coefficients were comparable across samples. Specifically, Table 2 shows that T1-T2 coefficients in Sample 1 (i.e., spanning a 4 year interval) were generally similar to T1-T4 rank-order stability coefficients in Sample 2 (i.e., spanning a 3-year interval) as the 95% confidence intervals overlapped in 16 out of 19 cases. Exceptions were the domains of Openness and Agreeableness, for which rank-order stability was significantly higher in Sample 2 compared to Sample 1. Note that we could not compare rank-order stability for the Openness facet of unconventionality across samples, because we could not retain reliable rank-order stability estimates for this facet in Sample 2.

<Insert Table 2 about here>

Mean-Level Change

Mean latent change estimates for Sample 1, and the mean slopes obtained with the Sample 2 models appear in Table 3. For both samples, the estimates reflect the estimated mean-level change per year. In order not to overwhelm readers and because of the poor fit of

some of the latent change models in Sample 1, we disregarded results obtained with a poorly fitting model in one sample whenever these were not replicated with a well-fitting model in the other sample. Furthermore, we chose to only discuss findings at $p < .01$ that appeared in either sample, and findings at $p < .05$ for which the 95% confidence intervals as obtained for both samples overlapped.

<Insert Table 3 about here>

At the domain level, both samples showed fairly similar patterns of changes as confidence intervals of change estimates overlapped for three of the Big Five domain level traits. Using data from Sample 1, Robins, Fraley, Roberts, & Trzesniewski (2001) previously found mean-level increases in Agreeableness, Conscientiousness, and Openness, decreases in Neuroticism, but no change in Extraversion; the different statistical technique used currently replicated their original findings despite that the fit of the models for Neuroticism and Openness were poor. The pattern of mean-level change obtained in Sample 1 was replicated in Sample 2 for three of the five trait domains. However, although some facets from both Agreeableness and Openness did increase (see below), the two domains did not change in Sample 2, and their slopes were significantly smaller than in Sample 1. In sum, our hypotheses for mean-level change at the trait level were generally confirmed.

Confidence intervals for facet-level change estimates for both samples overlapped for 10 out of the 13 (77%) facets for which we were able to examine mean-level change in both samples. In both samples and in line with our hypotheses, none of the Extraversion facets showed significant mean-level changes across college, whereas the Neuroticism facet of depression demonstrated a decrease. Also as hypothesized, the Agreeableness facets of prosocial and non-antagonistic orientation and the Conscientiousness facets of dependability and orderliness demonstrated increases in both samples. We did not form hypotheses for the Openness facets, but found unconventionality to demonstrate an increase in both samples.

There were only clear differences in mean-level facet change for 3 of the 13 facets across the two samples. However, the fit of the latent change models for two of these facets (i.e., the Agreeableness facet of nonantagonistic orientation and the Conscientiousness facet of orderliness) was poor, and cross-sample comparisons regarding these facets should be dismissed. However, models for the Neuroticism facet of anxiety did fit well in both samples. For this facet, the most striking differences were obtained as the direction of mean-level change was different across samples, with decreases in Sample 1, but increases in Sample 2.

For all adjustment measures, we found similar increases across time in both Samples 1 and 2. However, the models for self-esteem did not fit well in either of the samples (cf. self-esteem in Sample 1 modeled using several measurement waves, Chung et al., 2014). The models for social adjustment and academic adjustment had a poor fit in Sample 1, which is why change estimates should not be compared across the two samples.

Longitudinal Associations of Big Five Domains and Facets with Adjustment

Below, we describe co-development effects, effects of personality on adjustment, and effect of adjustment on personality in separate paragraphs to facilitate presentation of the results. (We also obtained within-time associations in our cross-lagged models, but do not discuss them here; they are available as supplementary material [Section D, Table I].) However, these different types of associations between particular personality traits and particular adjustment measures were taken from the same final models. Again, we only report findings at $p < .05$ that replicate in both samples (i.e., with overlapping 95% confidence intervals). Other findings are only reported in the tables. Note that, using overlap between 95% confidence intervals for estimates as a measure of replication, 77% of the co-development effects, 96% of the personality effects, and 96% of the adjustment effects were replicated.

Co-development effects. Correlated relative change, indicative of co-development between constructs, has rarely been examined for the adjustment measures and personality domains and facets we included. Our findings on correlated relative change are presented in Table 4.

<Insert Table 4 about here>

Table 4 demonstrates that there were medium to large negative correlations of change in self-esteem with changes in Neuroticism and all of its facets in both samples. Changes in self-esteem were less strongly, but still significantly, related to changes in Extraversion, Agreeableness, and Conscientiousness and all of their facets. These associations were positive. Confidence intervals^{viii} suggest that in both samples, changes in self-esteem were more strongly associated with self-reproach than with the other two Neuroticism facets, and that changes in self-esteem were more strongly associated with changes in positive affect than with changes in the other two Extraversion facets. Changes in self-esteem were correlated with changes in Openness in both samples. Confidence intervals suggest that if there were differences in the magnitude of the effects, these indicated that effects were a little stronger in Sample 1 than Sample 2. Overall, our findings are in line with our hypotheses.

Across samples, changes in social adjustment were negatively related to changes in Neuroticism and all of its facets, and positively related to Extraversion, Agreeableness, and Conscientiousness and all of their facets (with the exception of the orderliness facet of Conscientiousness). These findings are in line with our hypotheses. Changes in social adjustment were not consistently significantly associated with changes in Openness or its facets. Confidence intervals suggest that there were no replicable within-domain differences between facets regarding co-development with social adjustment.

Across samples, changes in academic adjustment were negatively correlated with changes in Neuroticism and its facets (except for anxiety), and positively correlated with

changes in Conscientiousness and its facets. This is in line with our hypotheses, although we also expected associations with Agreeableness. We further found an unanticipated effect in both samples, as changes in academic adjustment were positively related to changes in the positive affect facet of Extraversion. Confidence intervals suggest that there were no replicable within-domain differences between facets regarding their co-development with academic adjustment.

Personality effects. Effects of personality on adjustment are shown in Table 5. For both samples, we found that the Extraversion facet of positive affect was a positive predictor of self-esteem. Confidence intervals suggest that there were no replicable within-domain differences between facets regarding their effects on self-esteem.

<Insert Table 5 about here>

For both samples, we found that Extraversion and all of its facets were positive predictors of social adjustment, whereas Neuroticism and its depression facet were significant negative predictors of social adjustment. However, in Sample 2 the domain-level effect of Neuroticism was only significant across one of the three time lags (see Table 5). Confidence intervals did not point to replicable within-domain differences between facets regarding their effects on social adjustment.

In both samples, Conscientiousness and all of its facets, the Extraversion facet of positive affect, and the Agreeableness facet of prosocial orientation positively predicted academic adjustment. Confidence intervals suggest that in Sample 2 orderliness was a better predictor of academic adjustment when compared to the other Conscientiousness facets, but we did not obtain similar findings in Sample 1.

Adjustment effects. Cross-lagged paths indicating effects of adjustment on personality are shown in Table 6. In both samples, self-esteem was a negative predictor of the Neuroticism facets of self-reproach and depression, and a positive predictor of the

Extraversion facet of positive affect. Confidence intervals indicate no within-domain differences between facets in the way they were predicted by self-esteem.

<Insert Table 6 about here>

In both samples, social adjustment negatively predicted the Neuroticism facet of depression, and positively predicted Conscientiousness and its orderliness facet, and Extraversion and its facets of positive affect and activity. Confidence intervals suggest that the effect on positive affect was stronger in Sample 1 than in Sample 2. Confidence intervals point to no within-domain differences between facets in the way they were predicted by social adjustment.

In both samples, academic adjustment was a negative predictor of Neuroticism and its facets of self-reproach and depression. It was a positive predictor of Conscientiousness and all of its facets, and Agreeableness and its non-antagonistic orientation facet. Confidence intervals suggest that the effect on non-antagonistic orientation was stronger in Sample 1 than in Sample 2. These confidence intervals further suggest no within-domain differences between facets in the way they were predicted by academic adjustment.

Overall, our results were in line with our general hypothesis that co-development effects would be more common than directional effects. Unlike what we expected, we found at least as many replicable adjustment effects as personality effects.

Discussion

The current study investigated stability and change in Big Five facets and domains across the college years and examined longitudinal relations between these facets and domains and three important aspects of adjustment. Results reveal that Big Five facets did not differ much from the broader domains in terms of stability and change. Facets had comparable levels of rank-order stability as the broader domains, and facets within the same trait domain showed similar patterns of mean-level change. Results suggest that facets, like

domains, are relatively stable across the college years but also show a normative pattern of generally modest increases in psychological maturity. In addition, we found a complex pattern of transactional associations between the Big Five facets and adjustment. Specifically, not only were the personality facets associated with changes in adjustment, as previous literature would suggest, we also found that the adjustment was associated with changes in the Big Five, particularly the domains and facets of Neuroticism and Conscientiousness. Moreover, in some cases, we found evidence of bidirectional (i.e., co-developmental) effects, such as between Extraversion and its facets and social adjustment and between Conscientiousness and its facets and academic adjustment.

A Multi-Faceted View into Personality Stability and Change

Rank-order stability coefficients of Big Five facets and domains were almost all large (i.e., well above .50, with median coefficients close to .70). This stability is higher than was found in an extensive meta-analysis (Roberts & DelVecchio, 2000). It is also remarkably high, because it is measured over a fairly long span: a 4-year and a 3-year period were covered in Sample 1 and Sample 2, respectively. The high levels of rank-order stability are in part due to the structural equation modeling approach we used, which creates latent variables from which unreliability is parceled out, but they also might result from a certain consistency produced by the college context, which might help maintain rank order.

In general, rank-order stability across the set of facets was as high as rank-order stability of domain scores. As in Roberts and DelVecchio's (2000) prior meta-analysis, rank-order stability was only lower for facets when compared to domains in case of reliability problems, despite the fact that we used a latent variable approach that accounted for unreliability. In addition, in Sample 2, there was no evidence for systematic changes in rank-order stability of personality across the college years.

For mean-level change, our results provide evidence that most domains and facets within trait domains showed similar patterns of mean-level change across college. In both samples, we found supportive, further evidence for Roberts' maturity principle: the domains of Conscientiousness increased and Neuroticism decreased, and Extraversion did not change much. The findings at the facet level mostly tended to correspond to the domain-level changes. For example, across samples, we found decreases for the Neuroticism facet of depression. These findings on depression replicated past studies showing decreases in trait depression across young adulthood (e.g., Soto & John, 2012), as well as studies showing decreases in depressive symptomology in college (Orth et al., 2008). Remarkably, despite previous work demonstrating differential mean-level change in Extraversion (e.g., Roberts et al., 2006), we did not observe much of a difference across the facets. Again, this might have to do with the fact that the NEO-FFI captures social vitality content much more so than social dominance.

There were only a few cases in which facets within a given domain did not change similarly to one another. In Sample 1, different patterns for facets within a trait domain were found in two of the five domains (i.e., Agreeableness and Conscientiousness), but note that change estimates in facets for these domain were obtained from models that sometimes fitted the data poorly. The pattern of within-domain differentiation for the Neuroticism domain in Sample 2 was based on well-fitting models, but these findings did not replicate across samples and thus appear to be sample-specific. In addition, if we only considered comparisons that involved pairs of models that both fitted the data well, only 2 out of 14 possible comparisons for within-domain differentiation on those pairs of models (5 out of 26 if poorly fitting models were considered) turned out to be significant, which could indicate that at least some of these findings represent Type I errors.

Although there were mostly similarities between the two samples, there were also some differences which could suggest cultural or contextual differences. Some of these differences (i.e., those for the Agreeableness facet of nonantagonistic orientation, the Conscientiousness facet of orderliness, and the social adjustment measure) could be due to the poorly fitting latent change models in Sample 1. Other findings are likely more robust. Specifically, we found that both Agreeableness and Openness increased in the US sample, but not in the Belgian sample. At the facet level, we found that the Neuroticism facet of anxiety decreased in the US sample but actually increased in the Belgian sample. These differences collectively suggest that the US sample may display clearer changes towards psychological maturity and openness whereas the Belgian sample retains a relatively anxious personality. This suggests that Roberts and Wood's (2006) maturity principle manifests in a more modest way in our Belgian sample. These differences could be due to cultural variation related to the college experience. First, the admission policies of the universities from which our samples were drawn are very different. Although both universities are prestigious, UC Berkeley is difficult to gain admission to whereas the University of Leuven enrolls all students who apply. The result of these differences in admission is that Berkeley students may know their degrees afford them a certain privilege promising an easier transition into the workforce. On the other hand, Leuven students may graduate knowing they are competing with many for relatively few jobs. The prospects of this struggle may explain why anxiety tends to increase in the Belgian sample. A second way in which the college experience is different, is that Belgian students typically return home for the weekend unlike US students (Klimstra, Luyckx, & Meeus, 2012). As a result, Belgian students may have less opportunity for personal exploration, but instead may have greater stability in their relationships across college. Potentially, this could explain why the increases in Openness in our US sample were not present in the Belgian sample. It also suggests that the concept of emerging adulthood

(Arnett, 2000) and its hallmark of exploration may capture college in the US more closely than in Belgium.

Thus, our results may provide an example of how contextual differences, in this case perhaps differences in the developmental timing of specific social demands, could affect patterns of personality change. Such a differentiated pattern of findings is in line with a previous large-scale cross-sectional study that found some evidence for contextual (i.e., cultural) differences in social expectations being able to affect personality change (Bleidorn, Klimstra, Denissen, Rentfrow, Potter, & Gosling, 2013). However, if we only considered domain- and facet-level traits for which models fitted the data well in both samples, differences between samples in the present study were only found in 2 out of 11 mean-level change comparisons based on such pairs of models (5 out of 18 if poorly fitting models were considered). Thus, these findings could again represent Type I errors.

A Multi-Faceted View into the Transactions between Personality and Adjustment in College

Across both samples, it was rather striking to see how many traits and facets were longitudinally associated with self-esteem, social adjustment, and academic adjustment. Thus, personality is robustly interconnected with adjustment in college students. Only for Openness and its facets there were fewer associations, which was in line with our hypotheses.

Co-development effects between personality and adjustment were particularly plentiful, and many of these associations also turned out to be replicable across the two samples. These results suggest that Neuroticism and its facets of self-reproach and depression, the Extraversion facet of positive affect, and Conscientiousness and its facets of goal-striving and dependability are particularly relevant for college student adjustment, as these domains and facets were consistently associated with all three adjustment measures. Agreeableness, Extraversion, and all their facets had a somewhat more specific role, as they were consistently

associated with self-esteem and social adjustment to college, but not with academic adjustment. Co-development effects provide evidence for a model of development in which a more mature personality expresses itself in the form of better adjustment. Previous longitudinal studies linking personality to adjustment also found the strongest evidence for such a model (e.g., De Bolle et al., 2012; Klimstra et al., 2014). Our study expands upon those findings by confirming that co-development effects also usefully capture the longitudinal associations between personality and college student adjustment.

There was little evidence for a model exclusively supporting either personality effects or adjustment effects, but instead evidence for both. Evidence for directionality of effects between personality and adjustment has implications for two broad theories in personality, the Five Factor Theory (FFT; McCrae & Costa, 2008) and the Neo-Socioanalytic Model (Roberts & Wood, 2006). FFT argues that personality traits are endogenous variables that affect adjustment, but not the other way around. In other words, this theory would support a model of personality effects. The Neo-Socioanalytic Model of personality, on the other hand, posits that personality traits and social roles influence each other in a reciprocal fashion. Therefore, this model would support personality effects on adjustment just like the FFT. However, in addition, the Neo-Socioanalytic Model includes at least two relevant principles that also help to explain adjustment effects. First, the Social Investment Principle focuses on how investment in social roles may lead to trait change. Adjustment to the academic and social aspects of college serve as indirect indicators of investment in social roles specific to the student. Second, the Plasticity Principle argues more broadly that traits may always be influenced by the environment regardless of age. Therefore, although our main purpose was not to test these two broad personality theories, the current evidence has implications for both. Our results, which demonstrate both personality and adjustment effects, are fully consistent

with the Neo-Socioanalytic model, and partially consistent with FFT, which would not have predicted the adjustment effects.

Most of the significant directional associations turned out to be bidirectional. In this context, evidence for bidirectional effects of Conscientiousness and all of its facets with academic adjustment, and Extraversion and all of its facets with social adjustment (with the sole exception of sociability in Sample 1) was particularly robust. Thus, Conscientiousness appears to be as much intertwined with academic adjustment (i.e., the behaviors that are bound to lead to strong academic performance) as with the product of academic adjustment: academic performance (e.g., Nofle & Robins, 2007; Poropat, 2009; Vedel, 2014). Our findings further confirm the importance of Extraversion to social outcomes (e.g., Kurtz et al., 2012; Robins et al., 2005).

Two replicable and robust ($p < .01$) bidirectional associations applied to specific facets. That is, the Neuroticism facet of depression had a negative bidirectional link with social adjustment, whereas the Extraversion facet of positive affect had positive bidirectional linkages with self-esteem. Importantly, the parallel effects for the broader traits of Neuroticism and Extraversion were not as replicable or robust. This work supports previous facet-level work demonstrating the importance of these two facets to general well-being in a short-term longitudinal study (Schimmack, Oishi, Furr, & Funder, 2004). Both positive and negative emotions have been identified as key determinants of adjustment in longitudinal studies (Luhmann, Hoffmann, Eid, & Lucas, 2012; Lyubomirsky, King, & Diener, 2005, Orth, Robins, & Meier, 2009), which explains why the positive affect and depression facets, which are most directly related to these emotions, had such strong linkages with college student adjustment. The bidirectional nature points to the existence of both upward and downward spirals (Garland, Frederickson, Kring, Johnson, Meyer, & Penn, 2010) in which affect has an effect on adjustment, which consequently triggers further changes in positive

affect. In addition, it suggests evidence for the corresponsive principle (Caspi et al., 2005), which argues that the relationship between traits and environments include both processes of selection and influence in a fully transactional model. For example, depression is associated with having more negative social interactions and reacting more strongly to them (Steger & Kashdan, 2009). This tendency may be associated with spending more time alone in college, leading to poorer social adjustment, which in turn may lead to increases in depression due to lack of social support when stressors are encountered.

Overall, our findings regarding adjustment point out that adjustment indicators are typically associated with personality facets in the same way as they are associated with the overarching domain. However, a facet approach does seem to offer added value, as in several instances facets of a trait domain were significantly associated with adjustment when the association of adjustment with the overarching domain failed to reach significance. Thus, our findings provide modest evidence for the added value of personality facets in the prediction of adjustment. This likely is because additional trait-specific variance is captured when facets are included in addition to broad trait domains (Paunonen & Ashton, 2001).

Further research will need to inquire about the mechanisms that link traits to future changes in adjustment. We already discussed a potential mechanism (i.e., positive social experiences) when we discussed our findings regarding social adjustment and Extraversion, but studies that test such mechanisms are very much needed. Hampson (2012) called for future research to inquire about the personality processes which link together traits and consequential outcomes, and reviewed the available literature on how Neuroticism, Extraversion, and Conscientiousness influence outcomes through mechanisms of moderation and mediation. For example, previous experience-sampling research has examined how enacted behavior (i.e., personality states) helps to mediate the relationship between Extraversion and Positive Affect across a matter of weeks (Wilt, Nofle, Fleeson, & Spain,

2012). Longitudinal research that also applies experience sampling methods can help to establish how personality states may play a role over longer periods. However, relatively little research has yet been able to longitudinally examine mediators within the unidirectional association between personality and adjustment, and even less research has taken this bidirectionally. Although previous work has demonstrated that academic effort is a longitudinal mediator between Conscientiousness and academic *performance* (Nofhle & Robins, 2007), it is unknown whether academic effort is a mechanism linking Conscientiousness to academic adjustment and vice versa. It certainly is conceptually conceivable that investing effort in one's studies will bring about greater engagement with and enjoyment of the educational experience (i.e., greater academic adjustment), which in turn may spur students to invest more effort—this would identify a useful mechanism to explain the corresponsive principle supporting this link.

Strengths and Limitations

The primary strength of the present research is the use of two relatively large longitudinal datasets to examine development of personality domain- and facet-level traits, and the longitudinal linkages of these traits with adjustment. This allowed for an immediate examination of the replicability of our findings. To facilitate such comparisons, we reported the confidence intervals around our estimates. Because our datasets were obtained in two different settings, differences in findings may point to contextual effects on personality development. Another important strength of our design was that our longitudinal datasets contained multiple measurement occasions of both personality domains and facets, and the three adjustment measures we considered. This provided a unique opportunity for discerning the direction of effects between personality traits on the one hand, and self-esteem, social adjustment to college, and academic adjustment to college on the other hand. The fact that we relied on latent variables in our change and stability analyses is an additional strength, as

models with such variables parcel out part of the unreliability of the measures that are being used. This leads to more reliable change estimates. Furthermore, we tested for measurement invariance across time. Rigorous tests to examine whether the structure of constructs remains the same even now are not always conducted in longitudinal studies, but are a requirement for making sure that the meaning of constructs remains the same across time. It should, however, be noted that it is only a statistical test and that what for example Agreeableness means to a 18-year-old does not necessarily have to be the same as what it means to a 22-year-old.

Because of the strengths of our approach, our findings significantly advance extant knowledge on college students' personality and its relation to adjustment. At the same time, several limitations need to be acknowledged.

The use of the NEO-FFI to measure traits at a facet level represents a first set of limitations. The best-validated, available instruments to examine Big Five personality traits at a facet level are the NEO-PI measures (Costa & McCrae, 1992; McCrae et al., 2005), which distinguish six personality facets per domain instead of just two or three facets per domain that are distinguishable with the NEO-FFI. For example, our NEO-FFI facets likely only represent the social vitality aspect of Extraversion (see Saucier, 1998; Table 4), whereas assertiveness and excitement-seeking are not well-covered. Thus, the NEO-PI measures assess facets in a more comprehensive manner. However, the NEO-PI measures consist of 240 items and are in many settings, therefore, impractical. Yet, these measures were specifically developed to examine the facet level of personality, whereas post-hoc factor analyses were applied to identify facets in the NEO-FFI (Chapman, 2007; Saucier, 1998). This post-hoc approach caused some of the facet scales to consist of just a few (i.e., three) items, and items representing the same facet scale were sometimes quite diverse (e.g., the unconventionality scale included items on daydreaming and on whether participants think that decisions regarding moral issues should be left to religious leaders). Although the items

belonging to the same facet scale were usually much more consistent, this diversity and the small number of items per scale appears to be reflected in the low internal consistency of some of the facet scales (see also Chapman, 2007, and Saucier, 1998). Especially the Cronbach's alphas of the facet scales for unconventionality (in both samples) and pro-social behavior (only in Sample 2) were problematic. Therefore, results involving these two facets should be interpreted cautiously. At the same time, reliability issues mostly pertained to internal consistency estimated via Cronbach's alphas and less to poor cross-temporal reliability estimated via test-retest reliability, because our rank-order stability estimates generally were not low. However, note that the low Cronbach's alpha for unconventionality in Sample 2 caused limited variance in the latent variables we estimated, which in turn made it impossible to examine rank-order stability. To reduce chances of running into such problems, future studies should use relatively brief measures specifically developed to assess facets to retain good psychometric properties while pursuing practicality and avoiding participant fatigue. Recently, such a measure (i.e., the Big Five Inventory-2; Soto & John, 2017) became available, and has shown promising evidence for validity so far.

Our use of manifest instead of latent variables in the cross-lagged models is another limitation related to reliability. However, using latent variables was not feasible as this would have led to an undesirable ratio of parameters to be estimated relative to participants (e.g., Kline, 2005). Still, stability estimates of manifest variables tend to be lower than those of latent variables, which makes correlated change and cross-lagged effects more likely when manifest variables are used. Thus, although comparisons of latent growth and latent change models with cross-lagged models suggest that the latter provide more conservative correlated change estimates, findings of the present study might still be an overestimation of the actual cross-lagged effects in terms of the number of significant associations and the strength of the associations.

Another limitation concerns our use of college samples. Some of our research questions can only be addressed in this specific population (i.e., associations with social and academic adjustment to college). However, it should be noted that our findings regarding personality development and associations of personality with self-esteem are likely not representative of the general young adult population as a whole but may only be typical of Western Educated Industrialized Rich Democratic populations (WEIRD; Henrich, Heine, & Norenzayan, 2010). In addition, women were overrepresented, especially in Sample 2. Therefore, future studies should assess samples that are more gender-balanced and more representative in terms of educational background in order to gain greater insight into general developmental trends and associations with adjustment at the facet level of personality.

In addition, as is in common in longitudinal studies, we only used self-reported data. As a result, some of our findings may be inflated due to shared-method variance. However, the cross-lagged panel models we used partly control for such effects on cross-lagged paths by controlling for initial correlations and correlated change (e.g., Neyer & Asendorpf, 2001). It would still be beneficial to use other-reported data to further reduce shared-method variance, while keeping in mind that such data can also be biased (e.g., Wood, Harms, & Vazire, 2010). In fact, informant reports can create unique challenges in longitudinal studies of development, if informants' knowledge of and relationships with targets change.

Regarding the cross-lagged models, it should be noted that these, much like every single type of analysis, have their limitations (e.g., Hamaker et al., 2015). First and foremost, as we explained in the introduction section, these models represent between-person associations. This implies that cross-paths can be interpreted as a proxy of the direction of effects between two processes from a risk-assessment perspective. However, these paths do not have anything to do with mean levels and they can also never be interpreted as indicators of causality between two variables within particular persons. Given the limitations of our

models, the directionality of effects between personality facets and adjustment should be interpreted cautiously. In addition, the models we used tend to find more widespread evidence of correlated changes than directional effects because of timing: directional effects need to be timed just right for models to be able to detect them. For example, perhaps some high school students, in order to prepare for college, seek to increase in Conscientiousness by enacting behavioral strategies to prioritize getting schoolwork done before engaging in social activity and leisure. Therefore their Conscientiousness late in high school would yield increased academic adjustment across the point of the college transition. In this case, Conscientiousness at the beginning of college might not end up predicting increases in academic adjustment across their first year of college as part of a direct effect.

The relatively small number of measurement occasions forms another limitation. In Sample 1, we only had two measurement occasions available, which meant that only linear change could be modeled. Even with four waves of data, as in Sample 2, the opportunities to model complex change patterns are limited. Although it is worth noting that our analyses indicated that a linear change pattern fit the data better than a quadratic change pattern, future studies should try to include more measurement occasions in order to model complex patterns of change and stability. This would also tackle the related issue of our use of latent change instead of latent growth models in Sample 1. Many of these latent change models had a poor fit with our data and thus potentially produced unreliable results. Our compensation strategy (i.e., only interpreting results that either replicated across samples, or were significant at $p < .01$) reduced the chances of reporting Type I errors, false positive findings. However, the poor fitting models may have instead led to Type II errors, false negative findings.

Conclusion

Despite the previously mentioned limitations, the present study provides an important contribution to the existing literature on personality development and its impact on

adjustment. Our results demonstrate that so far a facet-level analysis of personality development does not provide notably different results than a domain-oriented analysis. However, we believe that this remains an open question, as longitudinal studies of facets in young adulthood are few and empirical efforts to reliably delineate distinguishable facets are still ongoing. When it came to prediction, facets within the same domain were often differentially associated with college student adjustment. Thus, by studying personality only at the domain level it is true that valuable information on college students' development and adjustment may be obtained, but it is also apparent that essential nuances might be overlooked. We demonstrated that even a measure that is typically only used for studying personality at the domain level (i.e., the NEO-FFI) can provide a nuanced and more detailed facet-level perspective on personality development. Therefore, we encourage more research to provide a multi-faceted view on personality change and its real world implications.

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Table 1. *Description of the NEO-FFI Facets*

Domain and Facets (number of items)	Description	Keywords/phrases highlighted in items
NEUROTICISM		
N: Self-Reproach (4)	Feeling inferior and ashamed	Inferior, worthless, helpless
N: Anxiety (3)	Feeling tense and worried	Tense, anxious
N: Depression (3)	Feeling sad and lonely	Lonely, discouraged, sad
EXTRAVERSION		
E: Sociability (4)	Preferring and enjoying being with people	Liking being around others, preference for doing things alone (R),
E: Positive Affect (4)	Being cheerful and light-hearted	Laughing easily, happy, cheerful, lively, optimistic
E: Activity (4)	Feeling energetic and having a fast-paced life	Bursting with energy, active, being where the action is
OPENNESS TO EXPERIENCE		
O: Aesthetic Interests (3)	Being drawn to and positively affected by art, literature, and nature	Intrigued with and being touched by art, nature, and poetry
O: Intellectual Interests (3)	Being intellectually curious and enjoying abstract thought	Broad range of intellectual interests, playing with theories or abstract ideas
O: Unconventionality (4)	Being open to new ideas and new ways of doing things	Daydreaming, doing things in the same way (R)
AGREEABLENESS		
A: Non-Antagonistic Orientation (8)	Avoiding being selfish, skeptical of people, and argumentative	Cooperating, manipulating (R), cynical and skeptical (R)
A: Prosocial Orientation (4)	Trying to be polite and considerate to people	Attentive, caring, courteous
CONSCIENTIOUSNESS		
C: Orderliness (5)	Being neat, organized, and methodical	Neat, clean, systematic, finishing things on time
C: Goal-Striving (3)	Having clear goals and working hard to accomplish them	Having clear goals, working hard to achieve goals, striving to excel
C: Dependability (4)	Working diligently to reliably meet one's commitments	Conscientious, keeping promises, reliable, being productive and finishing tasks

Note. Due to copyright restrictions for the NEO-FFI (Costa & McCrae, 1992), we unfortunately were unable to provide complete sample items.

Table 2. *Rank-Order Stability of Latent Personality Traits and Aspects of Adjustment*

Domain/Facet	Sample 1	Sample 2 (N= 485)				
	(N = 295)	T1-T2	T1-T4	T1-T2	T2-T3	T3-T4
	(95% C.I.)	(95% C.I.)				
NEUROTICISM	.54 (.42, .65)	.68 (.59, .76)	.81	.83	.77	
N: Self Reproach	.58 (.44, .72)	.70 (.61, .80)	.72	.82	.76	
N: Anxiety	.57 (.43, .72)	.68 (.56, .80)	.78	.81	.77	
N: Depression	.59 (.46, .72)	.56 (.44, .67)	.75	.75	.76	
EXTRAVERSION	.71 (.62, .80)	.78 (.68, .88)	.87	.83	.85	
E: Positive Affect	.70 (.61, .78)	.69 (.59, .79)	.82	.76	.78	
E: Sociability	.65 (.52, .77)	.68 (.53, .82)	.83	.82	.91	
E: Activity	.68 (.58, .78)	.77 (.65, .88)	.81	.76	.79	
OPENNESS TO EXPERIENCE	.70 (.60, .79)	.96 (.87, 1.05)	.89	.85	.95	
O: Aesthetic Interests	.74 (.65, .82)	.75 (.66, .84)	.81	.87	.89	
O: Intellectual Interests	.75 (.64, .86)	.88 (.78, .99)	.95	.80	.90	
O: Unconventionality	.66 (.40, .92)	N.A.				
AGREEABLENESS	.49 (.38, .59)	.74 (.60, .89)	.74	.82	.79	
A: Non-Antagonistic Orientation	.68 (.58, .78)	.68 (.54, .81)	.79	.82	.80	
A: Prosocial Orientation	.58 (.41, .75)	.36 (.11, .61)	.60	.76	.68	
CONSCIENTIOUSNESS	.63 (.51, .75)	.83 (.73, .93)	.86	.84	.82	
C: Orderliness	.82 (.71, .92)	.73 (.64, .83)	.86	.88	.81	
C: Goal-Striving	.53 (.42, .65)	.65 (.51, .78)	.79	.85	.80	
C: Dependability	.52 (.38, .66)	.71 (.54, .88)	.81	.78	.80	
ADJUSTMENT						
Self-Esteem	.62 (.52, .72)	.66 (.58, .75)	.79	.80	.84	
Social Adjustment	.52 (.32, .71)	.38 (.27, .50)	.51	.61	.67	
Academic Adjustment	.65 (.44, .86)	.59 (.44, .74)	.62	.71	.85	

Note. Values in the table are test-retest correlations obtained from confirmatory factor analysis models. All values are significant at $p < .001$. Confidence intervals for rank-order stability for the T1-T2 interval in Sample 1 and the T1-T4 interval in Sample 2 were added to facilitate comparisons between the two samples. Note that the timespan between T1 and T2 in Sample 1 is almost four years, whereas the timespan between T1 and T4 in Sample 2 is approximately three years. Note that no rank-order stability is reported for unconventionality in Sample 2, because this facet had limited variance at all measurement occasions. This resulted in correlations between latent variables estimated above 1.00.

Table 3. Mean-level Change estimates of Univariate Latent Change Models (Sample 1) and Univariate Latent Growth Models (Sample 2) for Personality Traits and Adjustment

Domain/Facet	Sample 1 (N = 295)			Sample 2 (N = 485)		
	Intercept	Slope	95% CI Slope	Intercept	Slope	95% CI Slope
NEUROTICISM	2.646	-.056***	-.074, -.039	2.956	-.033**	-.055, -.012
N: Self Reproach	N.A.	N.A.	N.A.	2.689	-.080***	-.104, -.057
N: Anxiety	3.783	-.046**	-.073, -.018	3.144	.045**	.018, .072
N: Depression	3.399	-.031*	-.061, -.001	3.030	-.048***	-.075, -.021
EXTRAVERSION	3.603	.001	-.015, .017	3.615	.003	-.012, .018
E: Positive Affect	3.283	.012	-.006, .030	3.838	.003	-.019, .025
E: Sociability	2.872	-.007	-.024, .011	3.580	-.005	-.023, .012
E: Activity	3.612	-.009	-.031, .013	3.445	-.001	-.018, .016
OPENNESS TO EXPERIENCE	3.504	.026***	.013, .039	3.455	-.006	-.021, .010
O: Aesthetic Interests	3.514	.005	-.020, .031	3.504	-.034**	-.058, -.010
O: Intellectual Interests	3.895	.034**	.013, .055	3.432	.006	-.017, .029
O: Unconventionality	3.403	.026**	.010, .041	3.378	.050***	.033, .067
AGREEABLENESS	3.303	.042***	.030, .054	3.785	.013	.000, .027
A: Non-Antagonistic Orientation	3.780	.076***	.060, .099	3.612	.019*	.003, .034
A: Prosocial Orientation	4.381	.036***	.018, .053	3.934	.020*	.004, .037
CONSCIENTIOUSNESS	3.192	.030***	.017, .044	3.413	.026***	.012, .041
C: Orderliness	3.548	.075***	.053, .096	3.222	.026*	.006, .045
C: Goal-Striving	3.385	-.007	-.025, .012	3.340	.024*	.002, .047
C: Dependability	3.375	.026**	.010, .043	3.692	.020*	.001, .039
ADJUSTMENT						
Self-Esteem	4.179	.054***	.036, .073	3.055	.067***	.053, .082
Social Adjustment	3.583	.046***	.031, .062	3.627	.097***	.073, .120
Academic Adjustment	3.236	.024**	.008, .041	3.272	.034**	.007, .061

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. No model was estimated for self-reproach in Sample 1, because there was no evidence for longitudinal (partial) scalar invariance. All intercept were significantly different from zero ($p < .001$). Slope/change factors in both models represent the estimated amount of mean-level change across a 1-year period.

Table 4. *Co-Development Effects: Correlated Change in Cross-Lagged Models of Personality Traits and Adjustment*

Domain/Facet	Self-Esteem		Social Adjustment		Academic Adjustment	
	Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2
	T1-T2	Averaged	T1-T2	Averaged	T1-T2	Averaged
NEUROTICISM	-.70 (-.75, -.64)***	-.59 (-.65, -.53)***	-.41 (-.51, -.31)***	-.32 (-.41, -.23)***	-.29 (-.40, -.18)***	-.19 (-.24, -.13)***
N: Self Reproach	-.76 (-.81, -.71)***	-.48 (-.53, -.43)***	-.41 (-.51, -.31)***	-.29 (-.35, -.23)***	-.31 (-.42, -.20)***	-.17 (-.23, -.12)***
N: Anxiety	-.37 (-.47, -.27)***	-.26 (-.31, -.21)***	-.19 (-.30, -.07)***	-.18 (-.24, -.13)***	-.09 (-.20, .03)	-.11 (-.17, -.05)***
N: Depression	-.52 (-.64, -.48)***	-.34 (-.39, -.29)***	-.41 (-.50, -.31)***	-.26 (-.31, -.20)***	-.29 (-.40, -.18)***	-.16 (-.22, -.10)***
EXTRAVERSION	.36 (.26, .46)***	.34 (.29, .39)***	.24 (.13, .35)***	.28 (.22, .33)***	.14 (.03, .26)*	.06 (.00, .12)
E: Positive Affect	.43 (.34, .53)***	.29 (.24, .34)***	.20 (.09, .31)***	.27 (.22, .33)***	.13 (.02, .25)*	.08 (.02, .13)**
E: Sociability	.16 (.05, .28)**	.10 (.05, .15)***	.19 (.08, .30)**	.16 (.10, .22)***	.07 (-.05, .19)	-.01 (-.07, .05)
E: Activity	.21 (.09, .32)***	.13 (.08, .18)***	.17 (.05, .28)**	.19 (.13, .24)***	.15 (.03, .27)*	.03 (-.03, .09)
OPENNESS TO EXPERIENCE	.24 (.13, .35)***	.07 (.01, .13)*	.17 (.06, .28)**	.02 (-.04, .07)	.15 (.03, .27)*	-.05 (-.11, .01)
O: Aesthetic Interests	.07 (.01, .13)*	-.05 (-.10, .00)	.08 (-.03, .20)	.01 (-.05, .07)	.09 (-.03, .21)	-.09 (-.15, -.04)**
O: Intellectual Interests	.27 (.16, .38)***	.02 (-.03, .07)	.14 (.02, .25)*	.03 (-.03, .09)	.28 (.17, .39)***	.02 (-.04, .08)
O: Unconventionality	.01 (-.11, .13)	.00 (-.05, .05)	.07 (-.05, .19)	.03 (-.03, .09)	-.11 (-.23, .01)	-.03 (-.12, .07) ^a
AGREEABLENESS	.35 (.25, .45)***	.22 (.17, .27)***	.16 (.04, .27)**	.24 (.19, .30)***	.11 (-.01, .23)	.06 (.00, .11)*
A: Non-Antagonistic Orientation	.29 (.18, .40)***	.12 (.07, .17)***	.12 (.01, .24)*	.19 (.13, .21)***	.07 (-.05, .19)	.05 (-.01, .11)
A: Prosocial Orientation	.38 (.28, .48)***	.13 (.08, .18)***	.16 (.05, .28)**	.24 (.18, .30)***	.15 (.04, .27)*	.05 (-.01, .11)
CONSCIENTIOUSNESS	.42 (.32, .51)***	.30 (.25, .35)***	.26 (.15, .36)***	.18 (.13, .24)***	.43 (.34, .53)***	.52 (.46, .56)***
C: Orderliness	.23 (.12, .35)***	.18 (.13, .23)***	.08 (-.03, .20)	.14 (.09, .20)***	.26 (.15, .37)***	.48 (.43, .53)***
C: Goal-Striving	.36 (.26, .47)***	.10 (.04, .15)***	.32 (.22, .42)***	.11 (.05, .17)***	.49 (.40, .58)***	.37 (.32, .43)***
C: Dependability	.39 (.29, .49)***	.13 (.07, .18)***	.25 (.14, .36)***	.15 (.09, .20)***	.34 (.23, .44)***	.25 (.19, .30)***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. The columns titled 'averaged' indicate correlated change between both sets of variables averaged across the various time lags in this study (e.g., T1-T2, T2-T3, and T3-T4). Full results for all time lags are available upon request. For Sample 1: N = 295 for Self-Esteem; N = 219-248 for Social and Academic Adjustment. For Sample 2: N = 485 in all analyses.

Table 5. *Personality Effects: Cross-Lagged Effects of Personality Traits on Adjustment*

Domain/Facet	Self-Esteem		Social Adjustment		Academic Adjustment	
	Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2
	T1-T2	Averaged	T1-T2	Averaged	T1-T2	Averaged
NEUROTICISM	-.12 (-.25, .02)	-.12 (-.20, -.04)** ^a	-.12 (-.23, -.01)*	-.08 (-.17, .01) ^a	-.08 (-.18, .03)	-.04 (-.09, .00)
N: Self Reproach	-.07 (-.22, .08)	-.10 (-.19, -.01)** ^a	-.07 (-.18, .03)	-.11 (-.17, -.06)***	-.05 (-.16, .06)	-.06 (-.11, -.02)**
N: Anxiety	-.07 (-.17, .04)	-.08 (-.12, -.04)***	-.09 (-.19, .02)	-.11 (-.16, -.06)***	-.06 (-.16, .05)	-.07 (-.12, -.03)**
N: Depression	-.08 (-.19, .04)	-.07 (-.10, -.03)***	-.12 (-.22, -.01)*	-.10 (-.16, -.05)***	-.08 (-.18, .03)	-.07 (-.11, -.02)**
EXTRAVERSION	.15 (.05, .26)**	.04 (-.03, .10)	.19 (.09, .30)***	.10 (.04, .15)***	.15 (.05, .25)**	.03 (-.02, .07)
E: Positive Affect	.15 (.04, .26)**	.07 (.03, .11)***	.13 (.03, .24)*	.15 (.10, .20)***	.12 (.02, .22)*	.07 (.03, .12)***
E: Sociability	.07 (-.04, .17)	.02 (-.01, .06)	.15 (.04, .25)**	.11 (.06, .15)***	.06 (-.05, .16)	.02 (-.03, .06)
E: Activity	.17 (.07, .28)**	.01 (-.03, .04)	.17 (.07, .28)**	.05 (.00, .10)*	.19 (.09, .28)***	.02 (-.03, .06)
OPENNESS TO EXPERIENCE	.04 (-.06, .13)	-.03 (-.06, .01)	-.08 (-.19, .02)	.01 (-.03, .06)	.10 (-.01, .20)	.01 (-.03, .06)
O: Aesthetic Interests	.04 (-.03, .11)	-.03 (-.06, .01)	-.04 (-.14, .07)	-.02 (-.07, .02)	.10 (.00, .20)	-.01 (-.06, .03)
O: Intellectual Interests	.04 (-.06, .14)	-.02 (-.05, .02)	-.04 (-.14, .07)	.05 (.00, .09)	.11 (.00, .21)*	.03 (-.02, .07)
O: Unconventionality	-.02 (-.12, .08)	-.02 (-.05, .02)	-.11 (-.22, -.01)*	-.02 (-.06, .03)	-.01 (-.12, .09)	-.03 (-.10, .05) ^a
AGREEABLENESS	.02 (-.07, .12)	.03 (-.01, .07)	.08 (-.02, .19)	.03 (-.01, .08)	.08 (-.03, .19)	.06 (.02, .11)**
A: Non-Antagonistic Orientation	.02 (-.08, .12)	.03 (.00, .07)	.08 (-.03, .18)	.06 (.01, .11)**	.04 (-.07, .15)	.07 (.03, .12)**
A: Prosocial Orientation	-.01 (-.12, .10)	.02 (-.02, .05)	.07 (-.04, .17)	.05 (.00, .09)*	.11 (.01, .22)*	.06 (.02, .11)**
CONSCIENTIOUSNESS	.00 (-.10, .10)	.09 (.05, .12)***	.05 (-.06, .15)	.06 (.01, .11)*	.18 (.07, .29)***	.15 (.09, .21)***
C: Orderliness	.03 (-.07, .13)	.10 (.06, .14)***	.07 (-.04, .17)	.09 (.05, .14)***	.14 (.03, .25)*	.23 (.17, .29)***
C: Goal-Striving	.01 (-.10, .11)	.05 (.01, .08)**	.01 (-.10, .11)	.06 (.01, .10)**	.13 (.02, .23)*	.09 (.04, .14)***
C: Dependability	-.04 (-.14, .07)	.05 (.02, .09)**	.02 (-.09, .12)	.07 (.03, .12)**	.15 (.05, .26)**	.07 (.03, .12)**

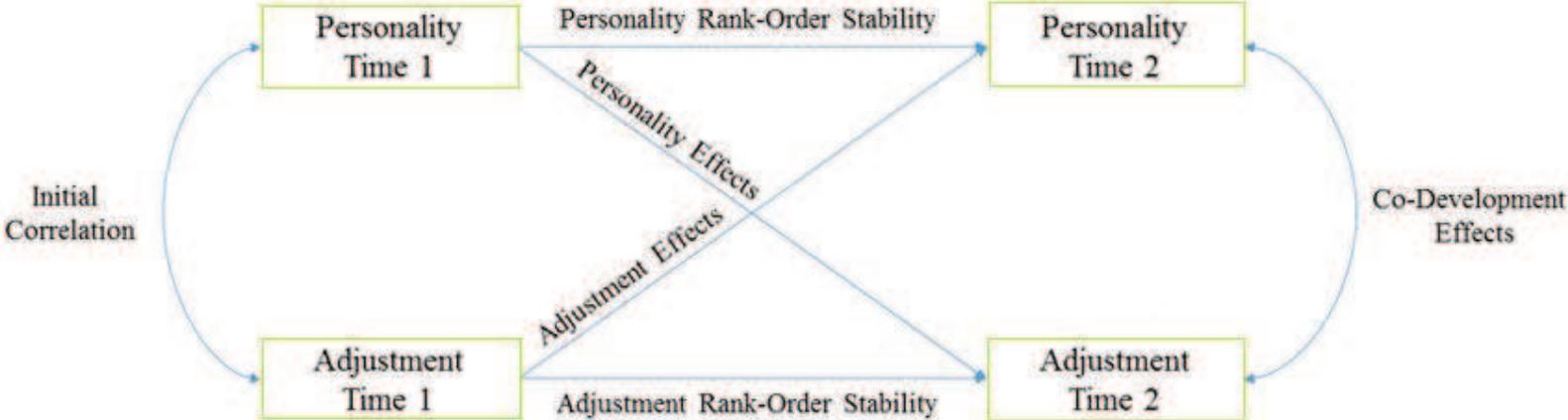
Note. * $p < .05$, ** $p < .01$, *** $p < .001$. For Sample 1, $N = 295$ for Self-Esteem; $N = 219-248$ for Adjustment. $N = 485$ in all analyses. ^a not significant across all time lags. The column 'averaged' represent the average cross-lagged effect calculated across all time lags (i.e., T1-T2, T2-T3, T3-T4) of Sample 2. Full results for all time lags are available upon request.

Table 6. *Adjustment Effects: Cross-Lagged Effects of Adjustment on Personality Traits*

Domain/Facet	Self-Esteem		Social Adjustment		Academic Adjustment	
	Sample 1	Sample 2	Sample 1	Sample 2	Sample 1	Sample 2
	T1-T2	Averaged	T1-T2	Averaged	T1-T2	Averaged
NEUROTICISM	-.12 (-.26, .02)	-.18 (-.26, -.09)** ^a	-.10 (-.20, .01)	-.07 (-.15, .00)* ^a	-.14 (-.25, -.02)*	-.07 (-.11, -.03)**
N: Self Reproach	-.20 (-.36, -.04)**	-.20 (-.28, -.12)** ^b	-.09 (-.20, .02)	-.07 (-.11, -.03)**	-.14 (-.26, -.02)*	-.08 (-.12, -.04)**
N: Anxiety	-.01 (-.12, .11)	-.10 (-.15, -.06)**	-.06 (-.17, .05)	-.07 (-.11, -.03)**	-.01 (-.12, .10)	-.06 (-.10, -.02)**
N: Depression	-.18 (-.30, -.06)**	-.14 (-.19, -.09)**	-.15 (-.26, -.04)**	-.10 (-.14, -.05)**	-.18 (-.29, -.06)**	-.08 (-.12, -.04)**
EXTRAVERSION	.04 (-.06, .14)	.05 (.01, .09)*	.16 (.06, .26)**	.06 (.02, .11)**	.08 (-.02, .18)	.06 (.02, .10)**
E: Positive Affect	.17 (.05, .28)**	.07 (.03, .11)**	.21 (.11, .31)**	.06 (.02, .10)**	.09 (-.01, .20)	.05 (.01, .08)*
E: Sociability	-.02 (-.13, .08)	.04 (.00, .08)*	.09 (-.02, .20)	.06 (.02, .10)**	.06 (-.05, .16)	.06 (.02, .09)**
E: Activity	.03 (-.09, .14)	.01 (-.03, .05)	.12 (.01, .23)*	.05 (.01, .09)*	.05 (-.06, .16)	.03 (-.01, .07)
OPENNESS TO EXPERIENCE	-.02 (-.10, .07)	.01 (-.03, .04)	.00 (-.09, .09)	.01 (-.03, .04)	.07 (-.03, .16)	-.03 (-.07, .01)
O: Aesthetic Interests	-.02 (-.15, .12)	.02 (-.02, .05)	-.03 (-.13, .06)	.00 (-.04, .03)	.09 (-.01, .19)	-.02 (-.05, .01)
O: Intellectual Interests	-.01 (-.11, .09)	.02 (-.02, .06)	.13 (.03, .23)**	.01 (-.03, .05)	.07 (-.04, .18)	-.01 (-.04, .03)
O: Unconventionality	-.06 (-.16, .04)	.00 (-.05, .04)	-.03 (-.13, .08)	.00 (-.04, .04)	-.03 (-.14, .07)	-.08 (-.15, .00)* ^a
AGREEABLENESS	.00 (-.09, .10)	.06 (.01, .10)**	.03 (-.07, .14)	.00 (-.04, .05)	.18 (.08, .29)**	.05 (.01, .09)*
A: Non-Antagonistic Orientation	.03 (-.07, .13)	.06 (.02, .10)**	.02 (-.09, .12)	.02 (-.02, .06)	.21 (.11, .32)**	.04 (.00, .08)*
A: Prosocial Orientation	.06 (-.05, .17)	.08 (.03, .12)**	.08 (-.03, .19)	.08 (.03, .13)**	.08 (-.04, .19)	.07 (.03, .12)**
CONSCIENTIOUSNESS	-.01 (-.10, .09)	.08 (.04, .12)**	.11 (.01, .21)*	.06 (.02, .10)**	.23 (.12, .34)**	.17 (.12, .22)**
C: Orderliness	.00 (-.10, .10)	.07 (.04, .11)**	.16 (.06, .25)**	.04 (.01, .08)*	.22 (.11, .32)**	.14 (.10, .19)**
C: Goal-Striving	.11 (-.01, .22)	.09 (.05, .13)**	.10 (-.01, .21)	.06 (.02, .10)**	.29 (.18, .40)**	.17 (.12, .21)**
C: Dependability	.02 (-.09, .14)	.09 (.05, .13)**	.01 (-.10, .13)	.07 (.02, .11)**	.13 (.01, .26)*	.13 (.09, .17)**

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. For Sample 1, $N = 295$ for Self-Esteem; $N = 219-248$ for Adjustment. $N = 485$ in all analyses. The column 'averaged' represent the average cross-lagged effect calculated across all time lags (i.e. T1-T2, T2-T3, T3-T4) of Sample 2. Full results for all time lags are available upon request. ^a not significant across all time lags, ^b significant across all time lags, but Significantly stronger at some time lags than at others. ^c positive effects across some time lags, negative effects across other time lags.

Figure 1. Sample Cross-Lagged Panel Model of Personality and Adjustment



Footnotes

ⁱ We use the term “facet” for its brevity and common usage to refer to a narrower trait subsumed under a broader trait (e.g., the NEO-PI-R facets; Costa & McCrae, 1992). However, we conceptualize a facet specifically as a subcomponent, a narrower trait at a lower level of a hierarchical system that along with other subcomponents comprises a broader trait such as one of the Big Five. Thus we conceive of orderliness, for example, as a part of being conscientious rather than as a type of Conscientiousness which the term *facet* might otherwise connote.

ⁱⁱ Mund and Neyer used the two facets of self-reproach and negative affect, whereas we used the three facets which split negative affect into anxiety and depression.

ⁱⁱⁱ In addition, most prospective studies did not control for initial levels of adjustment, which may have inflated estimates of the true prospective effect of personality on adjustment.

^{iv} In both Samples 1 and 2, Cronbach’s alphas for unconventionality were consistently low, as they were in the original scale development paper (Saucier, 1998). In Sample 2, Cronbach’s alphas for pro-social orientation were also consistently low. Therefore, analyses involving pro-sociality and especially unconventionality should be interpreted with utmost caution. Cronbach’s alphas of two more scales (i.e., sociability and dependability) were low (i.e., $<.60$) at some measurement waves, but not on others.

^v First, all of the items collected in the BLS that were relevant to social and academic adjustment were identified. This set of items was narrowed down to those given to participants both in the first year of college and at the end of college, which resulted in a set of 30 BLS items. Second, a rational method was used to map a BLS item which provided the best conceptual fit to each the 10 social and 10 academic adjustment items of the SACQ, which resulted in a set of 20 BLS items. Third, we administered the 20-item SACQ and the 30 BLS items in a new sample ($N = 225$). As a check on our conceptual mapping, we examined item-level correlations between each of the SACQ items and each of the conceptually mapped 20 BLS items, as well as with the 10 remaining BLS items. In a few cases, another item was chosen to represent the SACQ item than the item that was originally conceptually mapped due to a sizably stronger correlation in the new sample, although the newly selected item had to contain similar conceptual content. The resulting item-to-item correlations ranged from .15 to .68 (median $r = .31$). We then examined alpha reliability of the resulting analog scales in the new sample, and found adequate reliabilities for both the social ($\alpha = .77$) and academic ($\alpha = .72$) analog scales. We then examined the convergent validity of the analog scales with the SACQ scales, and found strong correlations for both the social ($r = .76$) and academic ($r = .73$) adjustment scales. When these correlations were corrected for attenuation due to unreliability, they were close to unity, at .93 and .91, respectively, suggesting they were measuring approximately the same constructs. Fourth, alpha reliabilities were calculated in the BLS data set. Alpha reliability analyses showed poor item-total correlations for two of the items in the social adjustment analog scale within both the Year 1 and Year 4 assessments; thus, we dropped these two items from the scale. When compared in the new sample, this change to an 8-item social adjustment scale had little effect on convergent validity ($r = .74$; corrected $r = .88$). Just like in the new sample, the alpha reliabilities in the BLS data set were adequate for the social ($\alpha = .70$ [Y1]; .82 [Y4]) and academic ($\alpha = .71$ [Y1]; .74 [Y4]) adjustment scales.

^{vi} This item was the sole adjustment item assessed during Year 2 instead of Year 1 of college. Including matched content to the SACQ was deemed more important than adhering

completely to items assessed only in Year 1 of college. All the items that made up the Year 4 adjustment scales were assessed at the end of Year 4.

^{vii} A series of model comparisons was run to examine whether adding such constraints was justified. For such comparisons, the use of multiple criteria has been advocated by Vandenberg and Lance (2000). We relied on three criteria to compare nested models: a significant chi-square difference test (Steiger, Shapiro, & Browne, 1985), a difference in CFI of $>.010$ (Cheung & Rensvold, 2002), and a difference in RMSEA of $>.015$ (Chen, 2007). Only if two of these criteria were satisfied, we would favor the less parsimonious model over the more parsimonious model with constraints. We found that in a series of model comparisons, at least two out of three fit criteria indicated that adding the previously described constraints did not result in an inferior model fit (Δ CFIs were $<.010$ or Δ RMSEAs $<.015$) for most of the models. However, adding these constraints did lead to a worse model fit in the models relating self-esteem to Neuroticism and its facet self-reproach, in the model relating social adjustment to Neuroticism, and in the model relating academic adjustment to the Openness facet unconventionality. Therefore, the final models for those variables did not contain the aforementioned constraints causing some of the effects to be different across time-lags.

^{viii} Although confidence intervals facilitate drawing some degree of comparison between the samples, it should be noted that the sets of confidence intervals are ultimately not fully comparable because they were obtained from different, non-nested, models.



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