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Do People Know How Their Personality Has Changed? Correlates of Perceived and Actual Personality Change in Young Adulthood

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ABSTRACT How much do we think our personality changes over time? How well do our perceptions of change correspond with actual personality change? Two hundred and ninety students completed measures of the Big Five personality traits when they first entered college. Four years later, they completed the same measures and rated the degree to which they believed they had changed on each dimension. Participants tended to view themselves as having changed substantially, and perceptions of change showed some correspondence with actual personality change. Perceived and actual change showed theoretically meaningful correlations with a host of variables related to different aspects of college achievement and adjustment.

DO PEOPLE KNOW HOW THEIR PERSONALITY HAS CHANGED? CORRELATES OF PERCEIVED AND ACTUAL PERSONALITY CHANGE IN YOUNG ADULTHOOD

The college years are often thought of as a time of personal transformation during which individuals become more independent, explore new opportunities, and reconsider their values, goals, and beliefs about themselves. Removed from a familiar home environment,

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young adults typically find themselves among a more diverse group of people than in high school and become immersed in different kinds of activities. This change in social setting allows for a plethora of new experiences—increased independence from family, successes and failures in the academic domain, romantic beginnings and endings, and the establishment of lifelong friendships. These new experiences cause young adults to question who they are, allow them (and sometimes force them) to change habits they have become accustomed to, and, eventually, often lead them to view themselves differently than they had before.

Psychologists have long conceptualized young adulthood as a time when people become engaged in a search for identity. One early lifespan theorist, Erik Erikson, characterized late adolescence as the critical juncture during which individuals face a crisis of “identity versus role confusion” (Erikson, 1964). The way a person resolves this identity crisis has important implications for personality development (Pals, 1999, 2001). The Eriksonian identity crisis may occur during late adolescence in part because this period typically entails what Hormuth (1990) referred to as a shift in the “social ecology of the self”—a transition into a new environment (such as college) that creates changes in social norms, expectations, and interaction partners, all of which contribute to a profound transformation of the self. Similarly, Arnett (2000) suggested that experiential and maturational changes occurring during late adolescence and early adulthood promote independence from one’s parents, exploration of new identities, roles, and relationships, and goal-oriented behaviors that facilitate successful adaptation to adult society.

Despite the many theoretical reasons for expecting dramatic changes in personality during late adolescence and the transition to young adulthood, the research literature suggests that radical changes in personality traits do not actually occur during this period (Roberts, Robins, Trzesniewski, & Caspi, 2003; Robins, Fraley, Roberts, & Trzesniewski, 2001). Thus, although college may be a time of considerable identity construction and reformation, it does not seem to entail a dramatic shift in basic personality traits. Indeed, contemporary research suggests that personality traits tend to remain highly stable over periods as long as 30 years (Costa & McCrae, 1989; Roberts et al., 2003; Roberts & DelVecchio, 2000). However, consistent with the views of many theorists, individuals seem to *believe* they have changed a great deal over the course of

their lives and often retrospectively report substantial changes in personality (Heckhausen, Dixon, & Baltes, 1989).

RESEARCH ON THE CORRESPONDENCE BETWEEN PERCEIVED AND ACTUAL PERSONALITY CHANGE

The discrepancy between folk notions of substantial and often dramatic personality change and empirical findings indicating modest, gradual personality change suggests that people may not be very good at describing their own personality development. Several lines of research hint at this possibility. Woodruff (1983; Woodruff & Birren, 1972) asked a sample of adults who had taken a personality test 25 years earlier to complete the measure again in the same way as they had originally and as they currently were. The findings showed that individuals' recollections about their past personality traits were only moderately related to their actual personality scores from 25 years earlier (r s ranged from .17 to .45), whereas their current personality scores were strongly related to their earlier scores (r s ranged from .58 to .65). The moderate relation between participants' recollections and their original scores reflected a tendency for them to think that they were more poorly adjusted 25 years ago than they actually had been.

Woodruff's findings are consistent with recent theorizing that people tend to derogate past selves in order to make their current selves feel better (Wilson & Ross, 2001), a process that would tend to decrease the correspondence between perceived and actual personality change. Wilson and Ross (2001) asked students to rate how they currently saw themselves on a number of traits at two time points, 2 months apart. At Time 2, students were also asked to provide retrospective ratings of how they had viewed themselves at the first time point. Wilson and Ross found that their retrospective ratings of themselves at Time 1 were more negative than either their actual ratings at Time 1 or their current Time 2 ratings, which suggests that people tend to derogate past selves and perceive positive changes in personality as occurring over time.

Fleeson and Heckhausen (1997) asked a stratified sample of participants (from ages 25–64) simultaneously to rate their current personality and their personality during early adulthood and found that participants tended to see themselves as having increased in

Agreeableness, Conscientiousness, and Openness, which is consistent with the idea that individuals may be biased toward positive, self-enhancing beliefs about their personal history (but is also consistent with normative changes in these traits across young adulthood; see Roberts et al., 2003). However, Staudinger, Bluck, and Herzberg (2003) paint a somewhat more complex picture of this process. They found that young adults tend to derogate past selves and idealize future selves, whereas older adults tend to do the reverse.

In a study of adult attachment, Scharfe and Bartholomew (1998) asked participants to fill out a categorical measure of adult attachment at two time points, 8 months apart. At the second time point, participants were also asked to fill out the measure in the way they thought they had completed it 8 months earlier. Scharfe and Bartholomew found that the accuracy of these retrospective reports depended on whether participants had actually changed or not. Most of the participants whose attachment style did not change accurately reported their original attachment category. However, most of the participants whose attachment style did change were unable to accurately identify their original attachment category; the majority of these participants incorrectly reported that their original category was the same as the one they had chosen to describe themselves at the second time point. Thus, participants tended to be accurate about their past selves if they remained the same, but if they had actually changed, they tended to think of their past selves as being similar to their current selves.

Henry, Moffitt, Caspi, Langley, and Silva (1994) obtained retrospective reports from individuals who had participated in a longitudinal study for the past 18 years. The participants were moderately accurate at describing changes in concrete characteristics such as height, weight, and place of residence, but their retrospective reports of changes in complex psychosocial variables such as family conflict, internalizing problem behaviors, and delinquent behaviors showed poor agreement with the prospective data documenting actual changes.

Costa and McCrae (1989; Herbst, McCrae, Costa, Feaganes, & Siegler, 2000) conducted two studies in which participants were asked to reflect on the degree to which their personality traits had changed over time. For each of the Big Five domains, participants were asked to compare their current personality to what they were like 6 years previously, responding with “more,” “less,” or “same.”

After comparing self-perceived changes with actual changes in personality scores, the researchers concluded that “for the most part, it appears that self-perceived changes in personality are misperceptions” (Costa & McCrae, 1989, p. 65), and that “self-perceptions of directional change are not, by and large, accurate reflections of real change” (Herbst et al., 2000, p. 386).

It is possible, however, that in *early* adulthood, self-perceived changes may show greater correspondence with actual personality change. If there is greater intraindividual personality change in younger than older adults, as has been found in previous research (e.g., Roberts & DelVecchio, 2000), then there is more opportunity for young people’s perceptions to covary with actual change. Another reason to expect greater correspondence is that young adults are actively focused on identity issues at this point in their lives (Erikson, 1964; Harter, 1999; Pals, 1999). Constructing one’s identity requires a good deal of self-reflection, which may promote insight into one’s life history and experiences. The identity theories of Erikson and others are consistent with the finding that adults in midlife tend to reflect upon their early adulthood as a time of “open exploration” (Fleeson & Heckhausen, 1997, pg. 134).

Young adulthood is an ideal age to examine these issues because it is a period when personality change should theoretically occur in tandem with identity construction. In line with identity theories and past research on perceptions of change, we expect that young adults will show some insight into how they have changed, but the degree of correspondence between perceived and actual personality change will be far from perfect. The current study addresses this question by examining the correspondence between young adults’ perceptions of how their personality has changed over time (perceived change) with changes in their scores on standardized personality tests (actual change).¹

1. We use the term “actual” because we examined actual changes in a person’s personality test scores. We are not equating these changes in NEO scores with “real” changes in personality. However, if one accepts standardized personality questionnaires such as the NEO as valid measures of personality, then the present findings can be conceptualized as contrasting perceived and real changes in personality traits. Indeed, in the personality literature, traits are most commonly measured using standardized self-report scales, and therefore we are assessing (albeit imperfectly) actual change as it is represented in the current tradition of personality assessment.

More specifically, the present research addresses three main questions concerning personality change in young adulthood: (a) To what extent and in what ways do young adults think their personality has changed? (b) How well do young adults' perceptions of change correspond with actual personality change? (c) What factors predict perceived and actual changes in personality? To answer these questions, we report data from a longitudinal study of young adults followed over 4 years of college. To identify specific changes in personality traits, we measured actual and perceived personality changes in the Big Five dimensions and assessed a number of other variables that are conceptually relevant to personality change during college.

CORRELATES OF PERCEIVED AND ACTUAL PERSONALITY CHANGE

Although there is a growing body of research on the correlates of actual personality change (see Roberts et al., 2003, for a review), we know of no research on the correlates of perceived change. In the present study, we will examine a number of variables that we predict will be related to both perceived and actual personality change. We examined variables from three domains: implicit self-theories of personality; achievement-related experiences and outcomes; and adjustment to college. These variables were selected because of their centrality to the college experience. Many of these variables were assessed at multiple time points so that we could examine whether changes in academic tendencies covaried with changes in personality. For example, do individuals who show a mastery response to academic challenge become better adjusted over the course of college?

Based on Dweck's (1999) model, we expect that implicit self-theories will relate closely to perceptions of personality change. According to Dweck, some individuals ("Entity theorists") believe their traits are fixed quantities that cannot be changed, whereas other individuals ("Incremental theorists") believe their traits are malleable. Thus, Entity theorists seem less likely than Incremental theorists to perceive their personality as having changed and may underestimate the degree to which they actually change over time. In contrast, Incremental theorists might believe they change more than they actually do. In the present study, we will examine whether an individual's

implicit self-theory predicts perceived personality changes. We expect that having an Incremental theory will be related to higher levels of perceived change because Incremental theorists believe their personality can change and should thus be more open to perceiving changes. However, by being more open to change, we also expect that Incremental theorists should also be more likely to experience actual change. In addition, because the Incremental orientation is related to positive outcomes in the academic domain (e.g., Robins & Pals, 2002) and to adaptive functioning in general (e.g., Dweck, 1999), we expected that Incremental theorists would show an overall pattern of positive changes in personality, perceiving and experiencing increases in Extraversion, Agreeableness, Conscientiousness, Emotional Stability (i.e., decreases in Neuroticism), and Openness to Experience.

We also assessed a number of achievement-related variables that we expected to be related to perceived and actual personality change, including achievement goals, social orientation, grades, affective response to grades, and mastery (vs. helpless) response. Based on Dweck's (1999) research, we would expect young adults who have mastery goals (i.e., who value learning more than performance) to both change and perceive themselves as changing in positive ways across the Big Five dimensions, particularly in Openness to Experience. The Openness dimension seems conceptually linked to the goal of attending college for the purpose of learning and expanding one's range of knowledge and experience and thus seems likely to be related to having a mastery goal.

In addition to Dweck's theory, the work of Ryan and Deci allows us to make predictions about performance goals (i.e., valuing one's performance over the process of learning). Ryan and Deci (2000) found that intrinsic motives, which are closely tied to mastery goals, are more adaptive than extrinsic goals, which are closely tied to performance goals. Furthermore, they demonstrated that extrinsic motives tend to have negative effects on emotional health, suggesting that performance goals will be associated with increases in Neuroticism during college. Finally, the Openness to Experience dimension seems intuitively linked to the goal of attending college for the purpose of learning and mastery and thus seems likely to be related to having mastery goals in the achievement context.

We expect that a student's social orientation (i.e., the degree to which he or she focuses on nonacademic aspects of university life)

will have the strongest relations with the interpersonal dimensions of the Big Five, Extraversion and Agreeableness (John & Srivastava, 1999). We expect that students' grades will relate most strongly to changes in Conscientiousness. Conscientiousness involves characteristics such as task orientation, attention to detail, responsibility, and punctuality, and it has been linked in previous research to academic outcomes and job performance (Barrick & Mount, 1991; Gray & Watson, 2002; Heaven, Mak, Barry, & Ciarrochi, 2002; Paunonen & Ashton, 2001). We expect that students' affective responses to their grades (i.e., how positively or negatively they feel about their academic performance) will relate to the two dimensions of the Big Five that are most closely related to affect, Extraversion and Neuroticism (Watson, Wiese, Vaidya, & Tellegen, 1999). We expect that the tendency to show a mastery response (i.e., persisting in the face of challenges) will relate to increases in perceived and actual Conscientiousness (because the person will be hard working and will respond effectively to academic challenges) and decreases in Neuroticism (because the person will cope with setbacks without experiencing excess negative affect and will strive to overcome the setbacks).

We also assessed three aspects of adjustment to college that we expected to be associated with perceived and actual personality change—quality of interactions with the university, emotional well-being, and physical well-being. We expect all three of these variables to be most closely related to changes in Neuroticism. Neuroticism is related to other measures of psychological adjustment and in past research has been associated with increased incidence of stress and illness (e.g. Costa, 1987; Larsen & Kasimatis, 1991; Shifren, Furnham, & Bauserman, 2003). In addition, we expect changes in Extraversion and Conscientiousness to be related to physical health, in line with recent findings (Goodwin & Engstrom, 2002; Roberts & Bogg, 2004).

METHOD

Sample and Procedure

This research uses data from the Berkeley Longitudinal Study of Personality and Self-Esteem Development, an ongoing study of a cohort of individuals who entered college in 1992 (for further details about the study, see Robins, Fraley et al., 2001; Robins & Pals, 2002). Participants were recruited during the first week of their first year of college and

then assessed annually throughout college. Participants were contacted by mail and asked to complete an extensive questionnaire in exchange for money (the financial incentive ranged from \$6 to \$20). 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. Our analyses focused on a subsample of participants who completed a measure of the Big Five in both the Week 1 and Year 4 assessments ($N = 295$).²

The sample of participants included in the present study is diverse in terms of ethnicity (41% Asian, 37% Caucasian, 13% Chicano/Latino, 4% African American, 5% Missing/Other/Multiracial), gender (59% female), socioeconomic status (20% came from families with 1992 household incomes below \$25,000 and 16% from families with household incomes above \$100,000), and academic ability (combined SAT scores ranged from 650 to 1540, $M = 1198$, $SD = 171$).

Measures

Perceived Personality Change

Perceived personality change was assessed at the end of the fourth year of college. Participants were asked to describe how they had changed since they entered college on each of the Big Five dimensions: Extraversion (defined as “talkative, outgoing, enthusiastic”); Agreeableness (“considerate, cooperative, trusting”); Conscientious (“organized, task-oriented, careful”); Neuroticism (“tense, anxious, easily upset”); Openness to Experience (“imaginative, creative, enjoys thinking”). Although these are essentially single-item measures of personality change, past research has demonstrated that single-item measures can have adequate reliability and validity (Gosling, Rentfrow, & Swann, 2003; Robins, Hendin, & Trzesniewski, 2001). The rating scale ranged from 1 (“decreased”) to 5 (“increased”), with the midpoint value labeled “stayed the same.” The

2. Participants (i.e., those who completed the personality measures at both time points) did not differ from nonparticipants on any of the Big Five dimensions, except that participants scored higher in Conscientious ($M = 3.53$, $SD = .56$) than nonparticipants ($M = 3.30$, $SD = .59$), $t = 4.37$, $p < .05$. Participants and nonparticipants also did not differ significantly on any of the perceived personality measures, in their SAT scores, or in their socioeconomic status. Participants were somewhat more likely than nonparticipants to be women (60% vs. 50%, $p < .05$). In light of these differences, the participants in the study may not represent a completely random, unbiased sample of the original study participants. Nonetheless, on most variables of interest, there were no differences between participants and nonparticipants, and our subsequent analyses are unlikely to be seriously biased by nonrandom attrition.

perceived change ratings were completed after all of the other questionnaires were administered.

Big Five Personality Dimensions

The Big Five were assessed using the 60-item NEO-Five Factor Inventory (NEO-FFI; Costa & McCrae, 1992). Items were rated on a 5-point scale ranging from 1 (“not very true of me”) to 5 (“very true of me”). The NEO-FFI was administered during the first week of college and at the end of the fourth year. Coefficient alpha reliabilities were .83 and .82 for Extraversion, .76 and .77 for Agreeableness, .81 and .83 for Conscientiousness, .84 and .85 for Neuroticism, and .77 and .75 for Openness to Experience, respectively for the two assessments.

Incremental Theory of Personality

Incremental theory of personality was assessed using a four-item scale (Robins & Pals, 2002) adapted from Erdley and Dweck’s (1993) Implicit Self-Theory scale. All four items reflect an Entity orientation: “My personality is something about me that I can’t change very much”; “I have a certain personality, and it is something that I can’t do much about”; “I can do things to get people to like me, but I can’t change my real personality”; “I can change the way I act, but I can’t change my true personality.” As Dweck (1999) noted, a scale containing only Entity items is preferable when “one is doing a longitudinal study that involves a number of repeated administrations of the measure . . . [because] there is still the risk that people will drift toward the incremental items over time” (p. 176). Items were rated on a scale ranging from 1 (“not very true of me”) to 5 (“very true of me”). All of the items were reverse-scored so that high values represent an Incremental orientation and low values represent an Entity orientation. The scale was administered in Years 2 (alpha = .85), 3 (alpha = .87), and 4 (alpha = .85).

Achievement-related Measures

Achievement goals. The mastery and performance goal scales were assessed using items administered across assessments (Robins & Pals, 2002). The mastery goal scale (alpha = .77) included five items (e.g., “The knowledge I gain in school is more important than the grades I receive”), some of which were administered in multiple assessments. The performance goal scale (alpha = .85) included six items (“Exams are stressful because I may not achieve the grade I want”), some of which were administered in multiple assessments. The mastery and performance

goal scales correlated $-.08$. The mastery and performance scales we used contain a mixture of approach and avoidance items.³

Social orientation. Social orientation was assessed in Year 4 by asking students to rank the importance of a set of social pursuits relative to a set of academic pursuits (getting good grades, learning, career preparation; receiving awards/recognition). The present analyses focused on importance rankings of two social domains: having good friends and being popular. Items reflecting the importance of academic pursuits (e.g., “learning”) were included in the achievement goals scales.

Academic performance. Academic performance was assessed using the students’ cumulative grade point average (GPA) after each semester of college. GPAs were obtained from university records.

Affective response to grades. The students’ affective response to their grades was assessed using 12 items from the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988), including six positive emotions (determined, enthusiastic, excited, inspired, proud, strong) and six negative emotions (ashamed, distressed, guilty, hostile, scared, upset). Specifically, participants were asked to “Use the following words to describe how you feel when you think about your college GPA.” Items were rated on a 5-point scale ranging from 1 (“very slightly”) to 5 (“extremely”). The items were administered in Years 2, 3, and 4. The positive and negative affect scales were strongly negatively correlated ($r = -.51$ across assessments), so we computed an overall affective response to grades scale by reverse scoring the negative emotions and then taking the mean of all 12 items ($\alpha = .90, .89,$ and $.91$ for Years 2, 3, and 4, respectively).⁴

Mastery response. Mastery (vs. helpless) response was assessed using eight items administered in Years 2, 3, and 4 (Robins & Pals, 2002). Four items were keyed toward mastery (e.g., “When something I am studying is difficult, I try harder.”) and four items were keyed toward helpless (e.g., “When I fail to understand something, I become discouraged to the point of wanting to give up.”). Items were rated on a scale ranging from 1 (not

3. In past research, Elliot and colleagues (Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001) distinguished between performance-approach and performance-avoidance goals and between mastery-approach and mastery-avoidance goals. The mastery and performance scales we used contained a mixture of approach and avoidance items; however, there were too few items to separately assess the approach and avoidance versions of the mastery and performance constructs.

4. We also computed separate Positive and Negative Affect scales. The findings for the two scales were virtually identical but in the opposite direction.

very true of me) to 5 (very true of me). Scales based on the mastery and helpless response items were strongly negatively correlated ($r = -.67$ across assessments), so we computed a composite measure by reverse scoring the four helpless items and then taking the mean of all eight items ($\alpha = .81, .82, \text{ and } .81$ for Years 2, 3, and 4, respectively).⁵

Adjustment to College

We assessed three aspects of adjustment to college—quality of interactions with the university, emotional well-being, and physical well-being.

Quality of interactions with the university. Students were asked three questions about the quality of their interactions with the university: “How satisfied are you with your experience at the university?” “How much do you think the university cares about you as an individual?” and “How much do you feel the university has made an effort to help you succeed here?” Items were rated on a scale ranging from 1 (“not at all”) to 5 (“very much”). A standardized composite of these three questions was used to measure quality of interactions at the end of the first semester of college and at the end of Years 1, 2, 3, and 4. Alpha reliabilities ranged from .65 to .70 (median = .69).

Emotional well-being. In the first assessment, emotional well-being was assessed using the Overall Life Satisfaction scale (Campbell, Converse, & Rodgers, 1976), the PANAS Positive Affect scale, and the Negative Affect scale (reverse-scored; Watson et al., 1988). In the second assessment, emotional well-being was assessed by the Overall Life Satisfaction scale. In Years 1, 2, 3, and 4, emotional well-being was assessed using the Overall Life Satisfaction scale, the Adjustment to College scale (adapted from Aspinwall & Taylor, 1992), the Perceived Stress scale (reverse scored; Cohen, Kamarck, & Mermelstein, 1983), and the Center for Epidemiological Studies Depression scale (reverse scored; Radloff, 1977). In the latent growth curve analyses to be reported, these variables were included as indicators of emotional well-being.⁶

Physical well-being. Two items related to physical health were administered in Years 1, 2, 3, and 4. To measure subjective health, participants re-

5. We also computed separate Mastery and Helpless response scales. The findings for the two scales were virtually identical but in the opposite direction.

6. We re-ran the analyses to be reported using growth curves computed across Years 1 to 4 (i.e., when emotional well-being was measured by the exact same set of variables). The findings were very similar, and all of the significant effects remained significant.

sponded to the question: “How would you rate your physical health right now?” This item was rated on a 5-point scale ranging from 1 (“poor”) to 5 (“excellent”). In addition, participants responded to the question: “How often did you go to the Student Health Service or see a private doctor since the beginning of Fall semester?” Response options included: 1 (“never”), 2 (“once or twice a year”), 3 (“once or twice each semester”), 4 (“several times each semester”), and 5 (“more than once a month”).

Assessing Change Over Time

To assess change in actual personality test scores, we regressed each of the Year 4 NEO scores on the corresponding Week 1 NEO scores and saved the standardized residuals. These residual change scores provide an individual-level measure of how much a person changed and in which direction; they adjust for differences in initial status and thus estimate how much individuals would have changed had they all started out at the same level. Although residual change scores have been critiqued because they tend to have low reliability and be strongly correlated with final status, they provide the best method for assessing change when only two points of data are available. Positive scores indicate relative increases over time and negative scores indicate relative decreases.

Most of the constructs were assessed on more than two occasions (i.e., Incremental theory, college grades, affective response to grades, mastery (vs. helpless) response, quality of interactions with the university, emotional well-being, and physical well-being). To assess change in these constructs, we conducted latent growth curve analyses using the *Amos* 4.01 structural equation modeling program (Arbuckle, 1999). A latent growth curve assesses within-individual change over time by estimating an intercept (or average level) and a slope (or per-year change over time) in latent constructs (e.g., Muthen & Curran, 1997; Willett & Sayer, 1994). A positive slope represents increases over time, and a negative slope represents decreases over time. The intercepts were centered at the midpoint of the time span and therefore represent mean levels around the middle of the college experience.

The intercept and slope for each construct can be examined as covariates of perceived and actual change. That is, perceived and actual change in each personality trait was correlated with the intercept and slope for the variables that had repeated assessments. This resulted in four correlations between each covariate and each Big Five dimension: (1) a correlation between the average level of the covariate (i.e., the intercept) and perceived personality change, (2) a correlation between change in the covariate (i.e., the slope) and perceived personality change, (3) a correlation between the average level of the covariate and actual personality change,

and (4) a correlation between change in the covariate and actual personality change. A positive correlation between the average level of a covariate and personality change indicates that being high on the covariate is related to an increase in personality. A positive correlation between the slope of a covariate and personality change indicates that an increase in that covariate is related to an increase in personality.

RESULTS

Perceived Changes in Personality

Table 1 shows perceived changes in the Big Five dimensions across college. In addition to mean ratings, the table also shows the percentage of participants who reported decreasing over time (scores of 1 or 2), staying the same (scores of 3), or increasing over time (scores of 4 or 5). Overall, the findings suggest that participants perceived a considerable amount of change in their personality traits. More than 50% of participants believed they had either increased or decreased on every Big Five dimension. For example, 68% of the sample believed they had become either more or less neurotic over the 4 years, whereas the remainder (32%) believed that they had remained the same. In fact, almost everyone (98%) believed that they had changed on at least one of the Big Five dimensions.

Table 1
Perceived and Actual Change in Personality Over Four Years
of College

Big Five dimension	<i>M</i> (<i>SD</i>)	Perceived change			Actual change ^a
		Decreased	Stayed the same	Increased	Mean change (Cohen's <i>d</i>)
Extraversion	3.54 (0.97)	12%	34%	54%	+ .03
Agreeableness	3.35 (0.97)	17%	42%	41%	+ .44*
Conscientiousness	3.56 (0.86)	9%	40%	51%	+ .27*
Neuroticism	2.69 (1.03)	44%	32%	24%	- .49*
Openness	3.64 (0.95)	10%	35%	55%	+ .22*

Note. *N* = 295.

**p* < .05.

^aThe actual change data are reproduced from Robins, Fraley, Roberts, and Trzesniewski (2001).

Most participants perceived themselves as increasing on the positive Big Five traits—Extraversion, Agreeableness, Conscientiousness, and Openness—and decreasing on the negative Big Five trait, Neuroticism. Overall, this pattern indicates a tendency for people to believe they are becoming more mature and well-adjusted during college.

Correspondence Between Perceived and Actual Changes in Personality

To what extent do the perceived changes described in the previous section map onto actual changes in personality? One way to address this question is to examine whether the dimensions on which participants perceived themselves to have changed were the same dimensions that showed actual mean-level changes. Using data from the same sample, Robins, Fraley et al. (2001) found mean-level increases in Agreeableness, Conscientiousness, Emotional Stability (i.e., low Neuroticism), and Openness to Experience (see Table 1). Thus, participants’ subjective impressions of change were consistent with the average direction of actual change for these four dimensions.

Another way to address the correspondence between perceived and actual change is to examine the correlations between the two sets of variables. All five correlations were significant, indicating that individuals who thought they had increased (or decreased) on a particular Big Five dimension did show a tendency to actually increase (or decrease) on that dimension (see Table 2). Participants showed

Table 2
Correlations Between Perceived and Actual Personality Change

Big Five dimension	Correlation between perceived and actual change
Extraversion	.22*
Agreeableness	.15*
Conscientiousness	.25*
Neuroticism	.33*
Openness	.17*

Note. $N = 290$.

* $p < .05$.

the highest correspondence for Neuroticism ($r = .33, p < .05$), and the lowest correspondence for Agreeableness ($r = .15, p < .05$) and Openness ($r = .17, p < .05$). Thus, individuals seem to have some insight into the way their personality has changed during college.⁷

Correlates of Personality Change

Table 3 shows correlates of perceived and actual personality change. We tested for gender differences in the correlations but only 7 of the 200 effects reported in Table 3 showed significant interactions with gender ($p < .05$). This is below what would be expected by chance, and therefore we do not interpret the few significant effects.

Is Incremental Theory of Personality Related to Perceived and Actual Personality Change?

Is the belief that one's personality characteristics are malleable associated with perceived and actual changes in personality? As Table 3 shows, individuals with an Incremental orientation increased in Agreeableness ($r = .17, p < .05$), Conscientiousness ($r = .14, p < .05$), and Openness ($r = .27, p < .05$), and decreased in Neuroticism ($r = -.14, p < .05$). These trends replicated for perceived personality change except for Agreeableness, which correlated positively but not significantly with Incremental orientation ($r = .10, ns$). Increases in the Incremental orientation (i.e., the slope) were positively correlated with both perceived ($r = .18, p < .05$) and actual ($r = .17, p < .10$) increases in Extraversion, although the latter effect was only marginally significant.

In addition to these analyses of directional change, we also correlated Incremental orientation with a global index of *absolute* perceived personality change. To measure absolute perceived change,

7. As a third way to examine the correspondence between perceived and actual personality, we compared the intercorrelations among perceived changes and the intercorrelations among actual changes. In general, the pattern of intercorrelations was highly similar for perceived and actual change. In both cases, all of the intercorrelations were positive, except that change in Neuroticism was negatively correlated with change in each of the other four dimensions. The few discrepancies involved differences in magnitude rather than direction. For example, actual change in Conscientiousness correlated .25 with actual change in Extraversion, whereas perceived changes in these two variables did not correlate significantly ($r = .10; ns$).

Table 3
Correlates of Perceived and Actual Personality Change

	Increase in Extraversion		Increase in Agreeableness		Increase in Conscientiousness		Increase in Neuroticism		Increase in Openness	
	Perceived	Actual	Perceived	Actual	Perceived	Actual	Perceived	Actual	Perceived	Actual
<i>Incremental theory</i>										
Average level	.02	.11	.10	.17*	.19*	.14*	-.22*	-.14*	.27*	.27*
Slope	.18*	.17	.08	.11	.09	-.04	-.11	-.10	.03	.05
<i>Achievement goals</i>										
Mastery	.05	.02	.12*	.27*	.12*	.05	-.15*	-.08	.23*	.18*
Performance	.07	-.17*	.08	-.13*	.04	-.17*	.16*	.40*	-.14*	-.11
<i>Social orientation</i>										
Good friends	.14*	.23*	.18*	.11	-.00	.03	-.01	-.05	.04	.01
Popularity	.14*	.15*	.11	-.08	.04	.06	.17*	-.01	.04	.03
<i>College grades</i>										
Average level	-.03	.06	-.03	-.01	-.06	.26*	-.06	-.09	.01	.05
Slope	-.08	.01	-.10	.04	.20*	.09	-.08	.00	-.12	.05
<i>Positive affective response to grades</i>										
Average level	.13*	.21*	.15*	.17*	.13*	.43*	-.23*	-.36*	.23*	.07
Slope	.11	.06	-.02	.18	.14*	.35*	-.33*	-.16	.26*	.28*

(Continued)

Table 3 (Cont.)

	Increase in Extraversion		Increase in Agreeableness		Increase in Conscientiousness		Increase in Neuroticism		Increase in Openness	
	Perceived	Actual	Perceived	Actual	Perceived	Actual	Perceived	Actual	Perceived	Actual
<i>Mastery response</i>										
Average level	.00	.20*	.02	.18*	.24*	.39*	-.31*	-.33*	.25*	.24*
Slope	.15*	.15	.17*	.20*	.19*	.26*	-.15*	-.13	.13	.13
<i>Quality of interactions with the university</i>										
Average level	.13*	.07	.16*	.14*	.15*	.12	-.09	-.15*	.18*	.02
Slope	.27*	.24*	-.03	.12	.00	.21*	-.23*	-.19*	.08	.12
<i>Emotional well-being</i>										
Average level	.14*	.26*	.17*	.23*	.23*	.36*	-.25*	-.48*	.27*	.15*
Slope	.20*	.21*	.19*	.27*	.03	.37*	-.35*	-.53*	.05	.17*
<i>Subjective rating of physical well-being</i>										
Average level	.11	.33*	.18*	.11	.14*	.28*	-.10	-.24*	.08*	.04
Slope	.18	.11	-.01	.00	.07	.05	-.15	-.14	.11	.14
<i>Number of doctor visits</i>										
Average level	.04	-.03	-.02	.09	-.07	.01	.17*	.07	-.07	-.09
Slope	.06	-.35*	-.03	-.04	.09	-.10	.12	.38*	-.08	-.11

*p < .05.

we recoded each of the perceived change ratings so that higher values indicated greater perceived change—either increases or decreases (i.e., “1” and “5” = 2; “2” and “4” = 1; “3” = 0)—and then composited the five recoded ratings. Absolute perceived personality change correlated .21 ($p < .05$) with Incremental orientation, suggesting that individuals with an Incremental orientation are more inclined to believe that their personality shows substantial changes than those with an Entity orientation.

Are Achievement-Related Variables Associated with Perceived and Actual Personality Change?

Table 3 shows correlations between several achievement-related variables—achievement goals, social orientation, college grades, affective response to grades, and mastery response—and perceived and actual personality change.

Achievement goals. Individuals with mastery goals tended to perceive positive changes in their personality and to show actual increases in Agreeableness ($r = .27, p < .05$) and Openness ($r = .18, p < .05$). Performance goals, in contrast, were related primarily to negative personality changes, including actual decreases in Extraversion ($r = .17, p < .05$), Agreeableness ($r = .13, p < .05$), and Conscientiousness ($r = .17, p < .05$) and both perceived ($r = .16, p < .05$) and actual ($r = .40, p < .05$) increases in Neuroticism. Thus, mastery goals tend to be adaptive in the academic context, whereas performance goals tend to be maladaptive.

Social orientation. Students who valued social goals over academic goals tended to show and perceive changes in the two interpersonal dimensions of the Big Five, Extraversion and Agreeableness. That is, participants who rated having good friends and being popular as important tended to become more extraverted and perceived themselves as increasing in Extraversion (r s range from .14 to .23, p s $< .05$). In addition, participants who rated good friends as important perceived themselves to have increased in Agreeableness ($r = .18, p < .05$), whereas students who rated popularity as important perceived themselves to have increased in Neuroticism ($r = .17, p < .05$).

College grades. We assessed grades at multiple points in time, allowing us to examine whether changes in academic achievement were

associated with changes in personality. Students with high grades tended to increase in Conscientiousness during the college years ($r = .26, p < .05$), but did not perceive themselves as having increased in Conscientiousness ($r = -.06, ns$). However, students whose grades improved over the course of college tended to perceive their Conscientiousness as having increased ($r = .20, p < .05$), despite the fact that they did not show any actual increases in Conscientiousness ($r = .09, ns$). We found no relations between college grades and any of the other four Big Five factors. However, grades were negatively correlated ($r = -.21, p < .05$) with absolute perceived change, suggesting that individuals who received poor grades tended to perceive themselves as having experienced more profound personality changes overall.

Affective response to grades. The analyses reported in the previous section show that academic achievement was associated with only one of the Big Five dimensions, Conscientiousness. However, individuals' affective responses to their grades were associated with all of the Big Five dimensions. Participants who reported feeling positively about their grades tended to perceive and show declines in Neuroticism ($r_s = -.23$ and $-.36, p_s < .05$, for perceived and actual change, respectively) and increases on the other four dimensions (r_s ranged from $.07$ to $.43$, all $p_s < .05$, except for actual changes in Openness). In addition, students who felt increasingly positive about their grades tended to perceive and show increases in Conscientiousness and Openness and to perceive themselves as decreasing in Neuroticism. Overall, getting good grades and feeling positive emotions about grades were both linked to increases in Conscientiousness, but only affective responses to grades were related to perceived and actual changes in all of the Big Five dimensions.⁸

Mastery response. The mastery response was associated with a general pattern of positive changes. Students with a mastery response to academic challenge tended to become more conscientious, emotionally stable, and open to new experiences; these effects held for both actual and perceived change (r_s ranged from $.24$ to $.39$;

8. We re-ran these analyses, controlling for college GPA, and all of the significant findings remained significant. Thus, the link between affective responses to grades and personality changes is not due to actual differences in achievement.

$ps < .05$). Mastery-oriented individuals also tended to become more extraverted and agreeable but did not perceive themselves as changing on these dimensions. Increases in the mastery response were associated with both perceived and actual increases in Agreeableness and Conscientiousness, perceived (but not actual) increases in Extraversion, and perceived (but not actual) decreases in Neuroticism.

Is Adjustment to College Related to Perceived and Actual Personality Change?

Table 3 shows correlations between three aspects of adjustment to college—quality of interactions with the university, emotional well-being, and physical well-being—and perceived and actual personality change.

Quality of interactions with the university. Students who reported positive interactions with the university tended to perceive and show increases in Agreeableness and decreases in Neuroticism. In addition, they perceived themselves as having increased in Extraversion and Conscientiousness ($r_s = .13$ and $.15$, respectively, $ps < .05$) but did not show significant actual changes on these dimensions (although the correlations were in the same direction). People who reported that their interactions with the university improved over time also tended to perceive and show positive changes in personality, including increases in Extraversion ($r = .27$ and $.24$ for perceived and actual change, respectively, $p < .05$) and decreases in Neuroticism ($r = -.23$ and $-.19$ for perceived and actual change, respectively, $p < .05$).

Emotional well-being. Emotional well-being was associated with perceived and actual changes on all of the Big Five. As expected, emotional well-being correlated most strongly with decreases in Neuroticism ($r = -.48$ for actual Neuroticism and $-.25$ for perceived Neuroticism, $ps < .05$). However, moderately strong effects were also found for Extraversion, Agreeableness, Conscientiousness, and Openness (r_s ranged from $.14$ to $.36$, $p < .05$).

Increases in emotional well-being also tended to correlate with positive changes on all of the Big Five dimensions. Again, these effects were the strongest for perceived and actual Neuroticism ($r_s = -.35$ and $-.53$, respectively, $p < .05$), but they were also moderately strong for perceived change in Extraversion ($r = .20$,

$p < .05$) and Agreeableness ($r = .19, p < .05$) and actual change in the other four dimensions (r s ranged from $.17$ to $.37, p < .05$). Overall, we found that emotional well-being and increases in emotional well-being were related to perceived and actual changes in all aspects of personality.

Physical well-being. As expected, subjective health was associated with both perceived and actual increases in Conscientiousness. Subjective health was also associated with actual increases in Extraversion and decreases in Neuroticism (r s = $.33$ and $-.24$, respectively, $p < .05$). However, changes in subjective health were not associated with either perceived or actual personality changes, although there was a marginally significant tendency for individuals with improving physical health to show actual and perceived increases in Extraversion and decreases in Neuroticism. Participants who reported going to a doctor frequently during college (implying poor health) tended to perceive themselves as having increased in Neuroticism ($r = .17, p < .05$), and participants who increasingly visited the doctor across college tended to show a corresponding increase in Neuroticism ($r = .38, p < .05$) and a decrease in Extraversion ($r = -.35, p < .05$). Thus, like emotional well-being, physical well-being was most strongly related to decreases in Neuroticism.⁹

DISCUSSION

The present research examined the relation between perceived and actual personality change in a sample of young men and women followed longitudinally over four years of college. The findings contribute to a growing literature on how personality changes throughout the life course and provide much needed data on the young adult period. Below we discuss the implications of our findings in regard to our central research questions.

9. In addition to examining the zero-order correlations reported in Table 3, we also conducted partial correlations between perceived change and each of the correlates of change controlling for actual changes, and, conversely, partial correlations between actual change and each of the correlates controlling for perceived change. Overall, about two-thirds (64%) of the significant correlations in Table 3 remained significant (56% of the perceived change correlations and 72% of the actual change correlations). Thus, in many cases, perceived and actual personality changes were independently associated with college-related experiences and tendencies.

Do People Know How Their Personality Has Changed?

Most participants in our study believed that their personality had changed substantially during college. About two-thirds reported having increased or decreased on each Big Five dimension, and virtually all participants reported changing on at least one dimension. Most individuals thought they had become more extraverted, more agreeable, more conscientious, less neurotic, and more open. The fact that many people see themselves as changing in a socially desirable way raises the question of whether they are illusory optimists who have deluded themselves into believing that they are changing for the better or whether they are accurately reporting on actual changes in their personality.

Although we cannot rule out the possibility that self-enhancement biases influenced a person's perceptions of change, our analyses show that students' perceptions corresponded to some extent with actual changes in their personality test scores. On average, the participants in the study did become more agreeable, conscientious, emotionally stable, and open to experience, just as they perceived themselves as having changed over this time period. There was one exception: people believed they had become more extraverted, but there was no evidence for such a change in actual personality scores.

We also examined whether individuals who believed they had increased (or decreased) on a particular personality dimension did in fact tend to show increases (or decreases) on that dimension. In general, participants' reports of how they had changed corresponded to some extent with how they had actually changed. For example, individuals who viewed themselves as becoming less neurotic did show a decline in Neuroticism during college. Thus, Costa and McCrae's (1989, p. 65) conclusion (based on an older sample than ours) that "self-perceived changes in personality are misperceptions" may not be true in our sample of young adults.

All of the perceived personality changes reflect increases in socially desirable traits (e.g., Conscientiousness) and decreases in socially undesirable traits (e.g., Neuroticism; see Costa & McCrae, 1989). This pattern suggests that people perceive themselves as becoming increasingly mature and competent (Roberts et al., 2003). These changes are consistent with personality theories that portray late adolescence and young adulthood as periods of rapid maturation (e.g., Erikson, 1964).

These findings raise a number of issues about perceived personality change that require further investigation. In particular, although participants showed some insight into how their personality had changed, the correspondence with actual change was modest. Thus, our sample included individuals who demonstrated changes of which they were not aware and individuals who perceived themselves to have changed when they had not. Why weren't people *better* at describing their own personality development? Aside from methodological factors that might have attenuated the correlation between perceived and actual personality, implicit beliefs and stereotypes about the college experience might prevent a person from seeing his or her personality in full light. For example, one student in our sample stated:

I think I have changed tremendously since I entered college. I see myself as a stronger individual with distinct interests in a wider variety of things. I feel as if I have a lot more self-confidence and higher self-esteem. I am no longer as shy or as naive as I was. At the same time, I see myself as being more cynical and more defensive about romantic relationships. I enjoy my private time much more and I feel much more mature and calmer than in my younger years.

Although such perceptions may be accurate, they may also reflect stereotypes about how the college experience—or the transition to adulthood more generally—influences personality development. Graziano, Jensen-Campbell, and Sullivan-Logan (1998) postulated that implicit theories of development, defined as expectancies about how an individual's personality might change in the future, have the potential to contribute to actual change in personality. In the present context, an individual's expectations about how his or her own personality has changed (or will change) may serve a similar function of shaping personality development. For example, a person's expectation that he or she is becoming more conscientious may lead to behaviors that verify that identity (e.g., Swann, 1997). Such a process would increase the correlation between self-perceived and actual change. However, if implicit theories are somewhat inaccurate and differentially held, this would reduce the correlation between perceived and actual change, which might be one reason for the modest correlations we found between actual and perceived change.

Consistent with the idea that implicit theories are linked to personality change, we found that individuals with an Incremental self-

theory tend to perceive and show more changes overall (i.e., absolute change) than those who believe their personality is fixed. Incremental orientation was also related to directional changes in personality, most notably increases in Openness, which is consistent with the conceptual definition of Openness as involving receptivity to new ideas, activities, and experiences.

Achievement-Related Variables and Personality Change

Although overall achievement-related experiences and tendencies were most strongly related to Conscientiousness, all of the Big Five dimensions were linked in some way. Students who focused on academics in adaptive ways perceive and experienced increases in Conscientiousness, Emotional Stability, and Openness, whereas students who focused more on social life (i.e., valuing good friends) tended to perceive and experience changes in Extraversion.

Students with mastery goals tended to perceive positive changes in their personality traits and experienced actual increases in Openness and Agreeableness. In contrast, those with performance goals tended to show negative changes across the Big Five, but they correctly perceived that they were decreasing only in Emotional Stability and Openness. Openness is conceptually associated with the goal of mastering new and perhaps daunting subject matter, rather than simply focusing on getting good grades. It would be interesting to explore whether these personality correlates of mastery and performance goals hold for both the approach and avoidance forms of each construct (Elliot & Harackiewicz, 1996; Elliot & McGregor, 2001). For example, is Openness linked only to mastery-approach or to mastery-avoidance as well? Future research should examine these issues using more fine-grained achievement measures.

In contrast to achievement goals, social orientation was related to the interpersonal Big Five dimension of Extraversion, as we had expected. Students who valued good friends and popularity more than other social and academic considerations tended to become more sociable. However, students who valued popularity tended to perceive becoming less emotionally stable, whereas students who valued good friends tended to perceive becoming more cooperative.

Individuals who received high grades tended to perceive and show increases in Conscientiousness. Grades were unrelated to change in any of the other four dimensions of the Big Five. However, students'

affective responses to their grades were associated with perceived and actual changes in all of the Big Five dimensions. Thus, whereas only Conscientiousness plays a role in a student's objective academic performance, a much wider range of personality characteristics played a role in shaping a student's subjective impression of his or her performance.

Students with a mastery (vs. helpless) response in the academic context tended to perceive and experience changes in personality traits relevant to academic success. Mastery response was most strongly associated with change in Conscientiousness and Neuroticism. Conscientiousness is closely related to the organizational skills, sense of responsibility, and hard work it takes to strive for mastery in academics. Neuroticism seems closely tied to how one copes with the inevitable minor setbacks students face in college; experiencing excessive anxiety when coping with failure might disrupt the adaptive response pattern of a mastery response. Overall, mastery response and Incremental self-theories had similar personality change correlates. This similarity is not surprising because Dweck's (1999) model predicts that individuals with an Incremental theory are more likely to adopt a mastery response in achievement contexts.

Our finding that personality change is closely related to myriad aspects of college life supports the notion that changes in the social context can influence not only perceived but also actual personality changes. Although we found that change in Conscientiousness was most closely related to the academic variables we studied, the other four Big Five dimensions also showed conceptually meaningful relations in some cases.

Entering a new social context, with its new demands and constraints, may contribute to changes in behavioral patterns and, correspondingly, to changes in personality and self. For example, the transition from being a big fish in high school to being a small fish at a large, elite university seems to necessitate a fairly dramatic transformation in a person's academic identity (Marsh & Hau, 2003), as well as an increased level of autonomy and independence. Similarly, individuals who transfer from the math department to the sociology department could experience a significant change in their level of sociability and show a corresponding belief that they have changed in Extraversion. Such a shift in the "ecology of the self" (Hormuth, 1990) may contribute to a shift in identity and, correspondingly, a shift in perceived and actual personality. However, because our

findings are correlational in nature, we cannot make causal statements about influences of these variables on personality change (or vice versa).

Adjustment to College and Personality Change

As expected, adjustment to college was strongly related to changes in Neuroticism. However, we also found interesting connections between adjustment and the other Big Five dimensions. Quality of interactions with the university was closely tied to changes in Extraversion and Neuroticism. Students who rated their interactions with the university positively tended to increase in Extraversion and decrease in Neuroticism during college. Students who are low in Neuroticism would seem to be the most able to take advantage of what the university has to offer and not be discouraged by difficulties in adjusting to an unfamiliar environment. Students high in Extraversion would be more likely to seek out other people to help them adapt to and excel in an unfamiliar setting and would thus get more out of college as a whole through their effective utilization of social networks. Interestingly, although we expected students who rated their interactions positively to increase in actual Openness, they only tended to perceive themselves as becoming more open and did not actually change on this dimension.

Emotional well-being was most closely related to perceived and actual change in Neuroticism, which is not surprising given that the two measures essentially tap the same content domain. However, our findings indicate that emotional well-being was related to actual and perceived positive changes in the other four Big Five dimensions as well, including perceived and actual increases in Extraversion, Agreeableness, Conscientiousness, and Openness. Perhaps these positive traits help individuals adapt successfully to the college context, which would facilitate well-being and promote subsequent positive changes in personality over the course of college.

Being in good physical health is another factor that may facilitate personal growth and personality development. Our strongest findings in this domain also reflect change in Neuroticism, as we had expected. We found that those who felt healthy tended to become less neurotic, whereas students who increased in Neuroticism over time tended to visit the doctor frequently. In addition, as expected, we found that students who increased and perceived in-

creasing in Extraversion and Conscientiousness tended to report better physical health.

In summary, our findings illustrate that both perceived and actual changes in personality are closely linked to constructs reflecting changes in social context from high school to college and the resulting new demands of college life. Although the bulk of our findings involved perceived and actual changes in Conscientiousness and Neuroticism, all of the Big Five personality dimensions were linked to some aspect of the college experience.

Limitations and Future Directions

The present study has a number of limitations that suggest the need for future research. First, our measure of actual personality change was based on change in scores on a self-report personality questionnaire. Social desirability and other response style tendencies may limit the validity of self-report personality scales (Paulhus, 1991; but see Piedmont, McCrae, Riemann, & Angleitner, 2000). A problem more specific to the present context is that responses to personality test items may be influenced by a person's beliefs about how he or she has changed during young adulthood. For example, if the participants in our study believed that college is a time of increasing maturity and adjustment, then their personality self-reports may have shifted in the direction of appearing more mature, producing apparent declines in negative traits and increases in positive traits. In addition, if perceptions of personality change did influence responses to personality test items, the correlations between perceived and actual change we found would be inflated. Ideally, then, the findings need to be replicated using non-self-report-based measures of personality change, such as peer or parent ratings.

Second, our measure of perceived change was based on a single rating, and its reliability is unknown. To increase reliability, it would be preferable to have participants rate the degree to which they had changed on multiple items from each content domain, such as on all of the items from each of the NEO Big Five scales. Regardless, the potentially low reliability of our single-item measure would only serve to attenuate the magnitude of the effects, so the fact that we found significant levels of correspondence between perceived and actual change remains noteworthy.

Third, the design did not allow us to distinguish personality change due to maturational factors (ontogenic change) and change due to the college experience (sociogenic change). Thus, we do not know whether the findings generalize to all individuals transitioning from late adolescence to early adulthood or just those who attend college. In some sense, the college context provides an environmental press for increases in Conscientiousness and Openness. The college environment encourages responsible, punctual, and task-oriented behaviors and other aspects of Conscientiousness that contribute to successful academic performance. Similarly, the college environment exposes individuals to a diverse set of ideas, people, and cultural traditions, while sparking their curiosity and stimulating them to consider a wider range of perspectives and values (Sanford, 1962). In addition to these experiential factors, important maturational changes occur in late adolescence that might contribute to some of these changes in personality (Spear, 2000; Walker, 2002). Thus, increases in Conscientiousness and Openness could reflect experiential factors associated with college, intrinsic maturational factors, or both. Disentangling these accounts requires research using a non-college-student control sample.

Fourth, by focusing on linear increases and decreases over time, we may have missed more dynamic patterns of intraindividual change (e.g., Brown & Moskowitz, 1998; Nesselroade & Boker, 1994). For example, if an individual's Neuroticism level increased sharply during the first year of college but then gradually returned to the initial level by the end of college, this individual would show no actual change according to our measures. If perceived personality changes reflect these kinds of complex developmental trajectories, it may appear that individuals have less insight into how they have changed than they actually do. Thus, future research would benefit from the use of methods to assess nonlinear change trajectories.

Fifth, most of the variables we examined as potential correlates were relevant to either the academic domain, which is linked to Conscientiousness, or to adjustment, which is linked to Neuroticism. It is likely that variables related to interpersonal functioning (e.g., peer and romantic relationships, social activities, etc.) would have stronger relations with the more interpersonal dimensions of personality, Extraversion and Agreeableness. Future research should explore which additional psychosocial factors in the college context are associated with perceived and actual personality change.

Another issue worthy of future research concerns changes in personality at different levels of analysis. In this article, we focused on basic personality traits. However, numerous levels exist in the study of personality, ranging from unconscious defenses to life stories (e.g., Emmons, 1995; McAdams, 1997). It is possible that each level exhibits distinct patterns of continuity and change over the life course (Conley, 1985; McAdams, 1994). In fact, when individuals consider how their own personality has changed, they may be more in tune with changes in personal goals, relationships, and memorable life experiences than changes in personality traits (Thorne & Klohnen, 1993). Certainly, open-ended responses, like the one presented earlier, suggest that people consider more than global traits when they think about changes in their personality. Future research on perceived and actual change across different units of personality would contribute substantially to our understanding of personality development.

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