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Does Openness to Experience matter in love and work? Domain, facet, and developmental evidence from a 24-year longitudinal study

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Abstract

Objective: Although numerous studies have demonstrated that personality traits predict important love and work outcomes, there is mixed evidence for the relevance of Openness to Experience to love and work. We sought to better understand the long-term consequences of Openness in these two domains.

Method: We examined the associations between Openness and 51 love and work outcomes using data from a 24-year longitudinal study of UC Berkeley students ($N = 497$) followed from the beginning of college into midlife. Using latent growth curve modeling, we examined whether Openness levels and change in Openness from college to midlife were associated with downstream love and work outcomes. Additionally, we tested whether three facets of Openness (intellectual interests, aesthetic interests, and unconventionality) had differential associations with outcomes.

Results: Although stable levels of Openness predicted few work or love outcomes, individual differences in Openness change were associated with delayed romantic commitment and some career outcomes. In addition, there were significant differences among facets of Openness: intellectual interests were highly associated with educational outcomes, whereas aesthetic interests and unconventionality predicted nontraditional career motivations.

Conclusions: We situate these results in past research on real-world consequences of personality traits and discuss implications for theory and future research.

KEYWORDS

career, Openness to Experience, personality, personality development, relationships

1 | INTRODUCTION

“Love and work ... work and love, that is all there is.”—Sigmund Freud, quoted in Erikson (1963).

Personality trait scores predict consequential work and love outcomes, as strongly as socioeconomic status and intelligence (Borghans, Golsteyn, Heckman, & Humphries,

2016; Ozer & Benet-Martinez, 2006; Roberts, Kuncel, Shiner, Caspi, & Goldberg, 2007). Specifically, a vast body of research has found that people who score higher in the Big Five traits of Conscientiousness, Extraversion, Agreeableness, and Emotional Stability tend to do better in school, achieve more in their careers, and have healthier interpersonal relationships. In contrast, we know relatively little about the relevance of Openness to Experience, the fifth Big Five trait, to these domains. Openness to Experience (henceforth, Openness) captures individual differences in curiosity, exploration, and breadth and

depth of cognition (DeYoung, 2014; McCrae & Costa, 1997). It is the Big Five trait most strongly associated with political values, intelligence, cultural behavior, and creativity (Schwaba, 2018). Despite these consequential trait correlates, past research has identified few consistent associations between Openness and love and work outcomes, suggesting that Openness is less relevant to these domains (Griffin & Hesketh, 2004; Mussel, Winter, Gelleri, & Schuler, 2011). Perhaps because of these mixed results, researchers have typically focused on the predictive power of the other Big Five, leaving us with an impoverished understanding of the relevance of Openness to love and work contexts.

In the present study, we examined the power of Openness to predict a broad set of love and work outcomes, including academic engagement, job characteristics, and relationship status, using data from the Berkeley Longitudinal Study (BLS; $N = 497$). This study has followed a cohort of students over a 24-year period from freshman year of college until midlife, affording a unique opportunity to understand the development and consequences of Openness across emerging and middle adulthood. We applied three approaches to advance our understanding of Openness, love, and work. First, in addition to examining broad measures of success (e.g. income), we tested the associations between Openness and more specific, nuanced outcomes in the domains of love and work that may reflect the motivations and choices of open people (e.g. hours worked per week, importance of various relationship roles). Second, to better capture the dynamic nature of the trait across these life stages, we examined how *change* in Openness from young adulthood into midlife predicted love and work outcomes. Third, we examined the extent to which three facets of Openness (intellectual interests, aesthetic interests, and unconventionality) differentially predicted these outcomes. In doing so, we aimed to clarify and extend our understanding of the relevance of Openness to love and work, the two domains that together encompass much of what society and individuals regard as most valuable (Erikson, 1959, 1963).

1.1 | The trait of Openness to Experience

Openness is a dimension of human personality characterized by individual differences in curiosity, exploration, and convergent and divergent thought (DeYoung, 2014, 2015; McCrae & Costa, 1997). Open people tend to have liberal rather than conservative political views (r s range between .30 and .50; Jost, Glaser, Kruglanski, & Sulloway, 2003; McCrae, 1996). They score higher on tests of crystallized intelligence (r s = .30–.40), fluid intelligence (r s = .10–.20; Ashton, Lee, Vernon, & Jang, 2000; DeYoung, Peterson, & Higgins, 2005), and creativity (r s = .20–.40; Puryear, Kettler, & Rinn, 2017). People high in Openness tend to read more books, go to more concerts, and visit museums more often

(r s = .15–.40, Schwaba, Luhmann, Denissen, Chung, & Bleidorn, 2018), and past research has also identified links between Openness and religiosity (Gebauer et al., 2014; Saucier & Skrzypińska, 2006).

Although Openness undergirds fundamental differences in how people think, feel, and act, previous research has struggled to identify robust love and work correlates of Openness. In the following section, we review past research and provide a portrait of what we currently know about how open people “get along” and “get ahead.”

1.2 | Openness and love

A large body of research has linked Openness to partner selection. Spouses tend to have similar Openness scores (Botwin, Buss, & Shackelford, 1997; McCrae, 1996) and people generally desire relationship partners who score high on Openness (Botwin et al., 1997). Multiple studies with large samples have found that people scoring higher on Openness tend to delay childbirth and have fewer children overall (r s = .10–.20; Jokela, Alvergne, Pollet, & Lummaa, 2011; van Scheppingen et al., 2016; Wayne, Musisca, & Fleeson, 2004). Other large-scale studies have identified a small but robust association between Openness and divorce ($r \sim .05$, Solomon & Jackson, 2014; Specht, Egloff, & Schmukle, 2011).

Beyond these few findings, other associations between Openness and love outcomes tend to be small in magnitude and often do not replicate across studies. For example, some researchers have found that people who score higher on Openness are less likely to be married (bivariate r = about $-.10$, Jokela et al., 2011; Wayne et al., 2004), while others have reported a positive association (r = .10, Specht et al., 2011). Depending on the study, Openness and relationship satisfaction are positively associated (Dyrenforth, Kashy, Donnellan, & Lucas, 2010), negatively associated (Solomon & Jackson, 2014), or not associated at all (r s = $-.15$ to $.15$, Dyrenforth et al., 2010). Further, past research has not found associations between Openness and attachment (Shaver & Brennan, 1992) or friendship (Harris & Vazire, 2016). Across many of these studies, Openness tends to be the odd trait out when compared to robust findings for the other Big Five.

Although there is no comprehensive theory tying together these findings, some researchers have posited that open people: (a) tend to delay commitments to romantic relationships in favor of romantic exploration (Bleidorn & Schwaba, 2016; Jokela et al., 2011), (b) eventually wind up pursuing romantic relationships, typically with other highly open people (Jokela et al., 2011; McCrae, 1996), and (c) are slightly less committed to these romantic relationships than their conventional peers (Solomon & Jackson, 2014).

However, these postulates are based on a fairly small number of findings and need to be bolstered by testing the

associations between Openness and other love domain outcomes. For example, the hypothesis that Openness is related to delayed romantic commitments is grounded in research on Openness and marital status. A more general and rigorous test of this hypothesis would require data on the associations between Openness and psychologically meaningful aspects of romantic relationships, especially during early adulthood when these relationships first tend to form. In summary, more research on love-related outcomes across different life stages is needed to refine our understanding of the relationship between Openness and love.

1.3 | Openness and work

The broader domain of work can be divided into two subdomains: education and career. We review past research on these two in sequence.

1.3.1 | Openness and education

Openness has consistently been associated with academic outcomes, such as educational attainment (Sutin, Luchetti, Stephan, Robins, & Terracciano, 2017) and verbal (but not mathematics) achievement test scores (Borghans et al., 2016; Nofhle & Robins, 2007). Prospective longitudinal studies (Lüdtke, Roberts, Trautwein, & Nagy, 2011) have found an association between Openness and college entry ($r = \text{about } .20$). Associations between Openness and grades have been less clear. One meta-analysis of personality and education found that Openness is associated with better grades in all levels of schooling, even when controlling for intelligence ($r_s = .10\text{--}.15$; Poropat, 2009). Other meta-analytic research has found a smaller association between Openness and college grades ($r = .05$, Nofhle & Robins, 2007). Beyond objective outcomes, Openness is associated with academic engagement ($r = \text{about } .30$) and less fear of academic failure ($r = \text{about } -.25$; Komaraju & Karau, 2005).

The relationship between Openness and educational outcomes appears relatively straightforward. Overall, open people tend to score highly on tests of crystallized intelligence and show interest in cognitive exploration, qualities that may lead them to score better on tests of verbal knowledge and to pursue further education (von Stumm, Hell, & Chamorro-Premuzic, 2011). As such, the primary purpose of examining the associations between Openness and educational outcomes in the present research was to replicate past findings.

1.3.2 | Openness and career

In the transition from school to career, Openness seems to lose much of its relevance. A meta-analysis of meta-analyses (Barrick, Mount, & Judge, 2001) found that Openness is uncorrelated with work performance ($r = .03$),

supervisor ratings ($r = .03$), teamwork ($r = .08$), sales performance ($r = -.01$), and managerial performance ($r = -.05$). These results stand in contrast to the other Big Five traits, especially high Conscientiousness and low Neuroticism, for which scores are highly associated with career success. Past longitudinal research has also found mixed associations of Openness with job satisfaction ($r_s = -.10$ to $.10$; Sutin, Costa, Miech, & Eaton, 2009; Wayne et al., 2004) and between Openness and income ($r = -.01$ to $.07$, Gellisen & de Graaf, 2006; Sutin et al., 2009). These results indicate small to negligible associations between Openness and career success, especially when compared to other Big Five traits (Borghans et al., 2016; Roberts et al., 2007).

Recent research has challenged these null findings by considering the value of Openness in the context of particular careers. For example, Denissen et al. (2018) found that people whose Openness is properly calibrated to the demands of their job earn higher incomes. For careers such as artist and professor, higher Openness is associated with higher income, but in careers where Openness is less relevant, such as insurance sales, it is not. Relatedly, past research has documented associations between Openness and career choices: open people are more likely to be self-employed or entrepreneurs ($r \sim .25$; Kohn & Schooler, 1982; Obschonka, Schmitt-Rodermund, & Terracciano, 2014), to be promoted into managerial roles ($r = .14$, Nieß & Zacher, 2015), and to have an occupation with greater decision-making latitude ($r = .16$; Sutin & Costa, 2010). At a broader level, Openness is associated with both interest and employment in careers considered to be artistic ($r = .56$), sociable ($r = .30$), and unconventional ($r = .18$; De Fruyt & Mervielde, 1997; Wille & de Fruyt, 2014).

As with love-related outcomes, the field lacks an overarching theoretical framework to synthesize research on Openness and career outcomes. Researchers have posited that some facets of Openness, such as adaptability and curiosity, may confer workplace benefits, while other facets, such as unconventionality, may be detrimental, leading to null associations between Openness and career success (Griffin & Hesketh, 2004; Mussel et al., 2011). Other researchers have suggested that open people value the intrinsic reward and autonomy of independent career paths over higher income and recognition associated with traditional, stable career paths (Dollinger, Leong, & Ulicni, 1996; McCrae & Costa, 1997).

However, additional research is needed to clarify and test these hypotheses. For example, the idea that open people follow independent, intrinsically rewarding career paths derives from research showing that open people are more likely to be self-employed and value autonomous careers (McCrae & Costa, 1997; Obschonka et al., 2014). A more general and rigorous test of this hypothesis would require data on the associations between Openness and other career motivations,

such as the subjective importance of salary and promotions. In summary, more nuanced research on career experiences is needed to substantiate the existing theory on Openness and work outcomes.

1.4 | Three approaches to advance our understanding of Openness, love, and work

Decades of research have left us with many lingering questions about the relevance of Openness to love and work. In our view, continued research on the association between Openness scores and broad metrics of success like income is unlikely to provide additional insight into these questions. Rather, we identify three approaches to improve our understanding of the association between Openness and love/work.

1.4.1 | Investigate specific, theoretically relevant work and love experiences

Although past research has revealed little evidence for associations between Openness and broad metrics of love and work success, associations may be clearer when investigating links between Openness and specific love and work experiences that exemplify exploration and unconventionality. For example, open people may be more likely to change careers (Wille & De Fruyt, 2014) or delay committing to relationships (van Scheppingen et al., 2016). More generally, investigating the choices and motivations of open people provides insight into the psychological realities of their love and work lives.

1.4.2 | Consider change in Openness

Personality traits are malleable, dynamic constructs that change across the lifespan. While researchers typically predict outcomes by associating personality scores at one measurement occasion with outcomes measured later, personality develops in the interim, providing additional developmental information that may predict important outcomes.

Investigating how changes in Openness from college into midlife predict love and work outcomes may prove especially informative. Past research has found personality development from ages 16–30 is particularly variable across people (Schwaba & Bleidorn, 2017). During this life stage, people typically explore in work and love before gradually committing to mature social roles (Erikson, 1959). Identity exploration and personality development may be reciprocally linked, as exploration may precipitate increases in Openness, and increases in Openness may promote exploration (Luyckx, Goossens, & Soenens, 2006). Conversely, early commitment to adult roles may bring about Openness decreases (Bleidorn et al., 2013; Bleidorn & Schwaba, 2016). Investigating the consequences of Openness change during emerging

adulthood can thus improve our understanding of this trait's relevance to work and love.

1.4.3 | Investigate facets of Openness

Citing the generally null pattern of associations between Openness and career success, researchers have suggested that a better way to understand the predictive utility of Openness is to focus on lower order trait facets (Mussel et al., 2011; Woo, Chernyshenko, Stark, & Conz, 2014). Of the five factors measured in the NEO-Five Factor Inventory (NEO-FFI), Openness has the most heterogeneous content (McCrae & Costa, 1997), and consequently its facets tend to be less correlated and show more strongly divergent developmental trajectories than facets of the other Big Five (Bleidorn, Kandler, Riemann, Angleitner, & Spinath, 2009). These findings suggest that the associations between Openness and life outcomes may be better understood at the facet level.

To date, research on the associations between Openness facets and life experiences has focused on academic and occupational outcomes. Kaufman and colleagues (2016) found that the aesthetics aspect of the Big Five Aspects Scale was more highly associated with creative achievement in arts, whereas the intellect aspect was more highly associated with creative achievement in sciences. Mussel and colleagues (2011) found that the NEO Personality Inventory-Revised facets of Openness to ideas, actions, and values were associated with self- and peer- ratings of job and school performance, while fantasy, aesthetics, and Openness to feelings were not. The present study expands on this research by examining how the three facets of Openness in the NEO-FFI, aesthetic interests, intellectual interests, and unconventionality (Costa & McCrae, 1992), are associated with a broad set of outcomes.

2 | THE PRESENT STUDY

In the present exploratory study, we examined the power of Openness (and its facets) to predict outcomes in the domains of love and work using three waves of data collected as part of the BLS that began in 1992 (Robins, Fraley, Roberts, & Trzesniewski, 2001). Students completed various surveys and assessments in the first week of their first year in college (Y1), at the end of their senior year of college (Y4), and 20 years after their senior year of college (Y24).

We used these data to examine the links between Openness and life outcomes in three ways. First, we examined the associations between Openness *levels* and love and work outcomes measured in college and midlife (see Table 1 for a complete list of outcome variables). We hypothesized that levels of Openness would be associated with outcomes that exemplify the ways in which curiosity and exploration

TABLE 1 Descriptive statistics

Variable	Time	N	Mean	SD	Min	Max
<i>Personality/demographics</i>						
Openness	Y1	489	3.62	0.58	1.83	4.92
	Y4	303	3.69	0.57	2.08	5
	Y24	229	3.73	0.57	2.25	4.92
Aesthetic interests facet	Y1	489	3.57	1.00	1	5
	Y4	303	3.54	1.09	1	5
	Y24	229	3.51	1.09	1	5
Intellectual interests facet	Y1	489	3.81	0.81	1	5
	Y4	302	3.89	0.82	1.33	5
	Y24	229	4.00	0.85	1.33	5
Unconventionality facet	Y1	489	3.47	0.62	1.25	4.75
	Y4	303	3.54	0.61	1.25	5
	Y24	229	3.49	0.62	1.75	5
Age	Y1	495	18.58	2.83	17	77
Female	Y1	495	0.57	0.50	0	1
Extraversion	Y1	489	3.47	0.61	1.42	5
Agreeableness	Y1	489	3.55	0.54	1.75	4.92
Conscientiousness	Y1	489	3.44	0.58	1.50	5
Neuroticism	Y1	489	2.96	0.69	1	4.67
<i>Work</i>						
H.S. GPA	Y1	489	3.91	0.49	2.05	4.96
SAT verbal	Y1	486	545.60	100.71	220	770
SAT math	Y1	486	637.20	99.59	330	800
Intrinsic acad. motivation	Y1	489	3.69	0.63	1.63	5
Extrinsic acad. motivation	Y1	489	3.32	0.73	1.44	5
Education expectation	Y1	304	4.28	0.73	1	5
	Y4	293	4.41	0.69	1	5
ID as Berkeley student	Y1	304	3.18	1.09	1	5
	Y4	290	3.20	1.12	1	5
UC Berkeley GPA	Y4	484	3.13	0.54	0.58	4
ID importance: student	Y4	294	3.20	1.42	1	5
ID importance: employee	Y4	295	2.27	1.36	1	5
Educational attainment	Y24	229	3.92	0.86	1	5
Employed	Y24	229	0.90	0.31	0	1
Years at job	Y24	228	7.30	5.20	0	22
Number of jobs	Y24	225	5.91	4.30	0	30
Job satisfaction	Y24	229	3.18	0.47	1.60	4.40
Work hours	Y24	227	4.99	1.45	1	8
Promotion worry	Y24	226	2.36	1.19	1	5
Work matters to ID	Y24	226	3.99	1.01	1	5
Care about salary	Y24	227	3.39	1.15	1	5
Care about job prestige	Y24	229	2.68	1.24	1	5
Self-report income	Y24	208	11.69	2.02	0	13.96
O*NET job income	Y24	205	11.36	0.47	9.93	12.14

(Continues)

TABLE 1 (Continued)

Variable	Time	N	Mean	SD	Min	Max
Income versus peers	Y24	187	0.65	0.63	−1.39	2.37
Event: change career	Y24	229	0.28	0.45	0	1
Event: move job	Y24	229	0.64	0.48	0	1
Event: fail project	Y24	229	0.10	0.30	0	1
Event: \$ problems	Y24	229	0.22	0.41	0	1
Event: fired/job trouble	Y24	229	0.15	0.36	0	1
Event: new job	Y24	229	0.76	0.43	0	1
O*NET realistic	Y24	205	27.35	26.16	0	100
O*NET investigative	Y24	205	49.96	32.27	0	100
O*NET artistic	Y24	205	30.25	23.79	0	100
O*NET social	Y24	205	52.88	31.19	0	100
O*NET enterprising	Y24	205	64.62	33.50	0	100
O*NET conventional	Y24	205	50.15	22.82	6	100
<i>Love</i>						
Relationship status	Y1	489	0.28	0.45	0	1
	Y4	301	0.42	0.49	0	1
	Y24	229	0.79	0.40	0	1
ID importance: friend	Y4	296	3.54	1.13	1	5
ID import: son/daughter	Y4	296	3.37	1.38	1	5
ID import: romantic part.	Y4	296	2.98	1.43	1	5
Conflict between roles	Y4	293	3.11	1.16	1	5
Married	Y24	229	0.68	0.47	0	1
Divorced	Y24	229	0.04	0.19	0	1
Has children	Y24	229	0.61	0.49	0	1
Number of children	Y24	229	1.22	1.12	0	4
Relationship satisfaction	Y24	228	3.90	0.87	1	5
Event: new relationship	Y24	229	0.48	0.50	0	1
Event: breakup	Y24	229	0.39	0.49	0	1

manifest in love and work. In particular, we expected that Openness would be associated with academic engagement, job mobility, decreased emphasis on career success, and uncommitted relationship status. Based on past research, we expected to find few associations with career success and relationship quality.

Second, we examined whether individual differences in Openness *change* over the course of 24 years were associated with love and work outcomes. We hypothesized that participants who increased in Openness would experience both the costs and benefits of prolonged identity exploration across emerging adulthood. Specifically, we expected that increases in Openness would be associated with increased job mobility and person-job fit but decreased financial stability and fewer romantic relationship commitments.

Third, we examined the degree to which levels and change in three *facets* of Openness—intellectual interests, aesthetic interests, and unconventionality—were differentially associated

with love and work outcomes. Consistent with past theory and research, we hypothesized that intellectual interests would be highly predictive of academic and career success (Griffin & Hesketh, 2004). We also hypothesized that aesthetic interests and unconventionality would be predictive of outcomes that exemplify exploration and autonomy, such as decreased romantic commitments and increased career mobility.

3 | METHODS

3.1 | Sample

Data come from the BLS (see Robins et al., 2001, for more details). The sample included 497 undergraduate students who entered the University of California at Berkeley (UCB) in 1992 and provided personality data. Participants were contacted in class during the first week of college and offered partial course credit for completing surveys.

Participants were surveyed once again at the end of the first semester. In subsequent assessments, participants were mailed a questionnaire to complete in exchange for movie tickets or \$6–\$20 at the end of each year in college. For the most recent follow-up, conducted roughly 24 years after the first assessment (between 2013 and 2016), participants were contacted using email, phone, and postcards, and asked to complete an online questionnaire in exchange for a \$25 or \$50 Amazon gift card. The original sample was diverse in terms of ethnicity, sex, SES, and academic ability (Robins et al., 2001).

In this study, we examined the subset of BLS participants who provided personality data at least once across the three measurement occasions (total $N = 497$): during the first week of their first year of college (Y1; $N = 489$), during their fourth year of college (Y4; $N = 303$), and at the 24-year follow-up (Y24; $N = 229$). To examine the potential effects of attrition, we compared participants who provided data at all measurement occasions with participants who did not. Participants who dropped out of the study tended to score lower at Y1 on the Openness facet of unconventionality, the Big Five domain of Neuroticism, high school grade point average (GPA), and extrinsic academic motivation (see Table S1). However, these effects were relatively small (all d s < 0.27), and we found no significant differences in 11 other Y1 variables, suggesting that study dropouts differed little from those who remained over the entire 24-year period (Table S1).

3.2 | Measures

3.2.1 | Openness

Participants completed the NEO-FFI (Costa & McCrae, 1992) at each of the three measurement occasions. This questionnaire contains a 12-item Openness scale (α s = 0.77 at Y1, 0.74 at Y4, and 0.72 at Y24). Past work has demonstrated a replicable lower order structure of the NEO-FFI where Openness is composed of three facets: aesthetic interests (3 items; example item “I am intrigued by the patterns I find in art and nature”; α at wave 1 = 0.76), intellectual interests (3 items; example item “I have a lot of intellectual curiosity”; α at wave 1 = 0.73), and unconventionality (4 items; example item “Once I find the right way to do something, I stick to it” (reverse scored); α at wave 1 = 0.42; Nofle, Klimstra, Luyckx, Goossens, & Robins, in press; Saucier, 1998). At each time point, we estimated Openness as a latent factor measured by the three facet scores.¹

3.2.2 | Work

We examined 37 work domain variables. We included all BLS variables related to subjective or objective qualities of

education and career that were readily interpretable, not redundant, and demonstrated sufficient between-person variance (see Table 1).

At Y1, beginning of college, we examined the self-reported variables of intrinsic academic motivation (latent variable measured by 8 items, $\alpha = 0.78$, sample item “Most academic tasks pose a challenge that arouses my interest”), extrinsic academic motivation (latent variable measured by 9 items, $\alpha = 0.77$, sample item “I study hard because it will payoff for me in a good job or going on to a prestigious graduate school”), identity importance of being a Berkeley student (“How important is being a Berkeley student to your overall identity as a person?”), and expected educational attainment (“What is the highest level of education you expect to attain?”). We also examined the associations between Openness and high school GPA as well SAT verbal and math test performance, obtained from university records.

At Y4, end of college, we examined the self-reported variables of identity importance of being a Berkeley student, expected educational attainment, the importance of being a student to their identity, and the importance of being an employee to their identity (part of a 5-item ranking scale along with the three role importance questions in the love domain). We also examined cumulative GPA at the completion of college degree, obtained from university records.

At Y24, the 20-year follow-up, we examined the self-reported variables of highest education obtained, employment status, years at present job (“How many years have you been in your present/most recent occupation?”), number of different jobs total (“How many different jobs have you had since entering the paid labor force?”), job satisfaction (latent variable measured by 5 items, example item “Most days I am enthusiastic about my work”, $\alpha = 0.87$), log-transformed income (“What is your current total annual household income?”), hours worked per week, concerns regarding promotion (“How worried are you about getting promotions and salary increases?”), and importance of work, salary, and job prestige (“How important is each of the following reasons in influencing YOUR choice of an occupation? I am interested in the work itself/The salary is high/The prestige or status of the occupation”). Participants were also asked whether the following events had happened to them in the past 10 years: change of career, change in place of employment, experiencing financial problems, being fired from a job or having serious trouble with an employer, failing a project at work, and starting a new job. Finally, participants reported their job title, which was matched to one of 974 Occupational Information Network (O*NET; Peterson et al., 2001) job codes by two raters (initial agreement: 68%, with discrepancies settled by discussion). We used these job codes to obtain objective work information via O*NET including the median income for this job (log-transformed), income compared to peers (self-reported income minus median job income), and

RIASEC job characteristics (the extent to which the job was rated by O*NET as Realistic, Investigative, Artistic, Social, Enterprising, and Conventional; Holland, 1997).

3.2.3 | Love

We examined 14 love domain variables, measured via self-report. At Y1 and Y4, we examined participants' relationship status ("What is your current relationship status?" 0 = single/not dating or single/dating, 1 = steady boyfriend/girlfriend, living with partner, or married). At Y4, we also examined the importance of being a friend/son or daughter/romantic partner to their identity (part of a 5-item ranking scale along with the two role-importance questions in the work domain) and role conflict ("To what extent do the demands of these different roles conflict with each other?").

At Y24, we examined relationship status, marital status, and divorce status with a single question ("What is your current relationship status?"). We coded responses of "married" as married, responses of "married," "living with partner," and "steady partner" as in a relationship, and responses of "divorced" as divorced (the other response options were "single and dating" or "single and not dating"). We also examined whether participants had children, the number of children, and relationship satisfaction (modeled as a latent variable measured by nine items, example item "My relationship is close to ideal", $\alpha = 0.95$). Participants were also asked whether, in the past 10 years, they had begun a new relationship or broken up with their partner.

3.3 | Statistical analyses

All analyses were done in R version 3.4.1 (R Core Team, 2013). We calculated the descriptive statistics using the psych package version 1.7.8 (Revelle, 2017), conducted measurement invariance tests and growth curve analyses using the lavaan package (Rosseel, 2012), and visualized the results using the ggplot2 package (Wickham, 2009).

We used the ML estimator and full information maximum likelihood (FIML) estimation to estimate the associations between Openness and continuous outcomes, and we used the WLSMV estimator and pairwise deletion to estimate the associations between Openness and binary outcomes (lavaan does not currently allow FIML estimation with binary outcomes). We assessed model fit using the χ^2 fit statistic, confirmatory fit index (CFI), and root mean square error approximation (RMSEA). CFI model fits above 0.95 and RMSEA fits below 0.05 indicate good model fit; CFIs above 0.90 and RMSEAs below 0.08 indicate acceptable fit (Cheung & Rensvold, 2002). We compared the fits of the nested models using χ^2 model comparisons and $p < 0.05$ as comparison cut-off. To facilitate the interpretability of the results, we standardized all the variables except

those with readily interpretable responses (such as number of children).

3.3.1 | Power analysis

We estimated statistical power to detect parameter-level associations between Openness and outcomes using a Monte Carlo simulation (see Supplementary Materials for more information). We first estimated power without considering measurement error (i.e., we modeled Openness as an observed mean score), which is the default method in power analysis programs such as GPower and the pwr package in R. For the association between Openness level and outcome, the power to detect associations of 0.10, 0.20, 0.30, and 0.40 was 20%, 60%, 90%, and 98%, respectively. For the association between Openness slope and outcome, power was 11%, 33%, 62%, and 83%, respectively. We then estimated power while accounting for measurement error (i.e., we modeled Openness as a latent variable composed of the common variance between facets). For Openness level, the power to detect associations of 0.10, 0.20, 0.30, and 0.40 was 9%, 23%, 42%, and 60%, respectively. For Openness slope and outcome, power was 8%, 13%, 26%, and 40%, respectively.

The results of these power analyses thus suggest this study was well powered by conventional standards, but power was reduced when accounting for the unreliability of the measures.² To properly balance Type-I and Type-II errors in the present study, and to transparently communicate uncertainty in point estimates, we emphasize effect size measures and confidence intervals, we interpret all the associations with a p -value of less than 0.05 or a standardized effect size greater than $B = 0.20$, and we focus on describing the patterns of the results rather than individual point estimates. R code for these power analyses can be obtained from osf.io/urc46.

4 | RESULTS

4.1 | Development of Openness across college and early adulthood

After establishing the measurement invariance for the Openness measure across time (see Supplementary Materials), we estimated a second-order latent growth curve model across the 24-year study period (see Figure 1 for a path diagram of this model). In this model, the latent-level variable estimates a participant's stable levels of Openness across the entire 24-year study period and the latent slope variable estimates total change in a participant's Openness scores between Y1 and Y24, with the factor loading of Y4 Openness on the slope score indicating the percentage of total change that occurred between Y1 and Y4.

This second-order latent growth curve model fit the data well (CFI = 0.983, RMSEA = 0.037, 95% CI [0.015, 0.056],

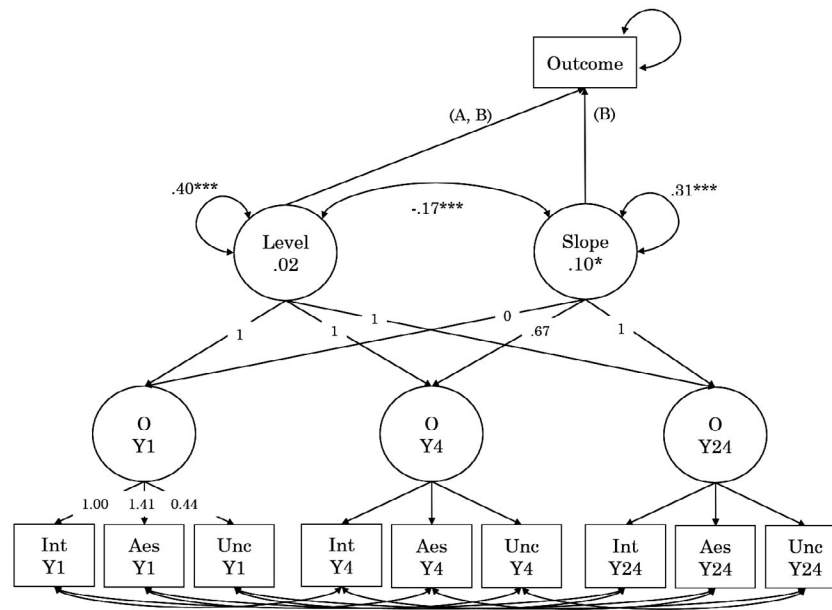


FIGURE 1 Second-order latent growth curve model for Openness

$\chi^2(25) = 41.65, p = 0.02$). The results suggested that the mean levels of Openness increased across the study period (slope $B = 0.10, p = 0.011$), and that two-thirds of this change occurred during college, as indicated by a Y4 slope factor loading of 0.67. Furthermore, there were significant individual differences in both Openness levels (level variance = 0.40, $p < 0.001$) and change (slope variance = 0.31, $p < 0.001$; see Figure 2 and Table S2).

We also explored the development of three Openness facets from college to midlife (cf. Nofle et al., in press). We estimated three second-order latent growth curves in a single model, one for each of the three NEO-FFI Openness facets (for a path diagram, see Figure 3).

The results suggested that facets developed differentially from college into midlife. Across the study period, the average participant tended to increase in intellectual interests ($B = 0.157, p < 0.001$) and unconventionality ($B = 0.114, p = 0.003$), but remained relatively stable in aesthetic interests ($B = -0.018, p = 0.549$; see Figure 2 and Table S3). We also found evidence for significant individual differences in facet-level development and correlated change between these facets. Specifically, changes in aesthetic interests and intellectual interests were correlated ($B = 0.227, p < 0.001$), as were changes in intellectual interests and unconventionality ($B = 0.128, p = 0.001$). However, change in aesthetic interests was uncorrelated with change in unconventionality ($B = 0.039, p = 0.182$). These correlated change estimates were small, suggesting that facets often develop independently of one another (cf. Nofle et al., in press).

4.2 | Openness and work

We examined the associations between levels of Openness and work outcomes by regressing each of the 37 outcomes on the latent Openness-level factor (Figure 1). This allowed us to examine the cross-sectional associations with Y1 outcomes as well as longitudinal associations with Y4 and Y24 outcomes. Each of these models fit acceptably to the data, ($CFI \geq 0.91, RMSEA \leq 0.07$; see Table S4 for complete fit information for each model). We present the focal parameter estimates for each of these models in Table 2.

The results indicated that Openness levels were significantly associated with 6 of the 12 educational outcomes tested in this study. Openness levels were positively associated with SAT verbal scores ($b = 30.03, p < 0.001, 95\% \text{ CI } [14.54, 45.51]$) and predicted college GPA at the end of Y4 ($B = 0.14, p = 0.003, 95\% \text{ CI } [0.04, 0.24]$). Openness levels were strongly associated with Y1 intrinsic academic motivation ($B = 0.59, p < 0.001, 95\% \text{ CI } [0.51, 0.67]$) and educational expectations: participants who scored high on Openness expected to attain more education than their peers at both Y1 ($B = 0.23, p < 0.001, 95\% \text{ CI } [0.13, 0.33]$) and Y4 ($B = 0.16, p = 0.007, 95\% \text{ CI } [0.04, 0.28]$). Openness predicted positive identification with the University of California, Berkeley at Y4 ($B = 0.13, p = 0.046, 95\% \text{ CI } [0.01, 0.25]$), but not at Y1.

Consistent with past research, Openness levels were mostly unassociated with career outcomes, as only 2 of the 25 associations emerged as significant by our criteria. Specifically,

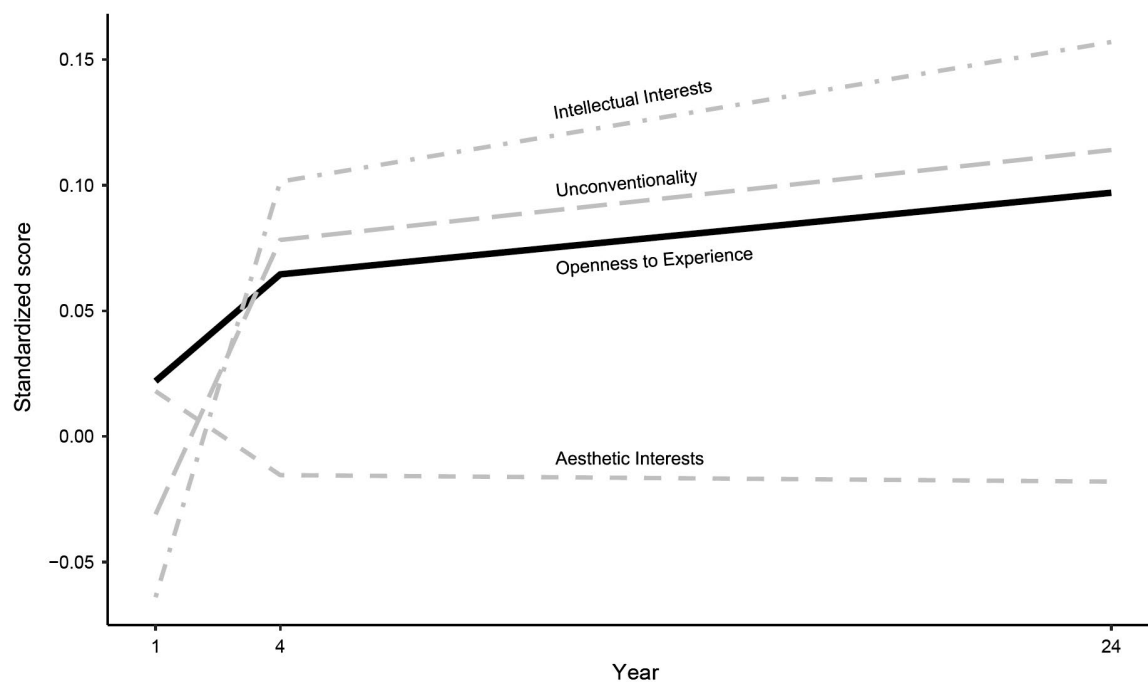


FIGURE 2 Openness trait- and facet-level development across 24 years

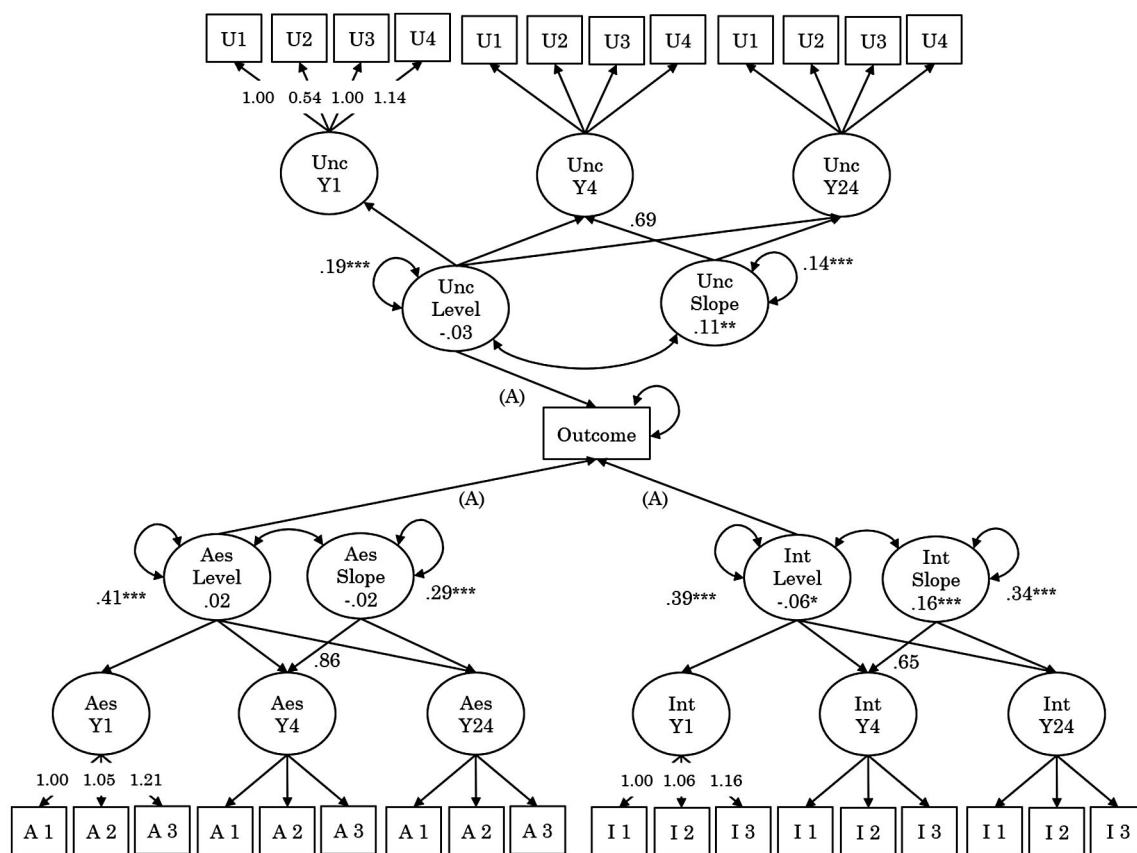


FIGURE 3 Trivariate facet-level latent growth curve

(Continues)

TABLE 2 Associations between levels of Openness and work domain outcomes

Parameter	Time	Variable type	Association	SE	<i>p</i>	95% CI
H.S. GPA	Y1	Std.	0.08	0.05	0.091	[−0.02, 0.18]
SAT verbal	Y1	Unstd.	30.03***	7.90	<0.001	[14.54, 45.51]
SAT math	Y1	Unstd.	12.43	8.48	0.143	[−4.18, 29.04]
UC Berkeley GPA	Y4	Std.	0.14**	0.05	0.003	[0.04, 0.24]
ID as Berkeley student	Y1	Std.	−0.01	0.06	0.879	[−0.13, 0.11]
Intrinsic acad. motivation	Y1	Std.	0.59***	0.04	<0.001	[0.51, 0.67]
Extrinsic acad. motivation	Y1	Std.	−0.11	0.06	0.062	[−0.23, 0.01]
Education expectation	Y1	Std.	0.23***	0.05	<0.001	[0.13, 0.33]
Education expectation	Y4	Std.	0.16**	0.06	0.007	[0.04, 0.28]
ID Import: student	Y4	Std.	−0.10	0.07	0.142	[−0.24, 0.04]
ID Import: employee	Y4	Std.	−0.03	0.06	0.618	[−0.15, 0.09]
ID as Berkeley student	Y4	Std.	0.13*	0.06	0.046	[0.01, 0.25]
Educational attainment	Y24	Std.	0.07	0.07	0.289	[−0.07, 0.21]
Employed	Y24	Binary	0.02	0.17	0.888	[−0.31, 0.36]
Years at job	Y24	Unstd.	−0.06	0.57	0.913	[−1.18, 1.06]
Number of jobs	Y24	Unstd.	0.34	0.53	0.527	[−0.70, 1.37]
Job satisfaction	Y24	Std.	0.24***	0.07	<0.001	[0.10, 0.38]
Work hours	Y24	Std.	0.07	0.08	0.382	[−0.09, 0.23]
Promotion worry	Y24	Std.	0.06	0.08	0.413	[−0.10, 0.22]
Work matters to ID	Y24	Std.	0.12	0.07	0.090	[−0.02, 0.26]
Care about salary	Y24	Std.	−0.07	0.08	0.384	[−0.23, 0.09]
Care about job prestige	Y24	Std.	0.08	0.07	0.225	[−0.06, 0.22]
Event: change career	Y24	Binary	−0.23	0.14	0.093	[−0.50, 0.04]
Event: move job	Y24	Binary	0.07	0.14	0.610	[−0.20, 0.34]
Event: fail project	Y24	Binary	0.28	0.18	0.120	[−0.07, 0.63]
Event: \$ problems	Y24	Binary	0.06	0.14	0.655	[−0.22, 0.35]
Event: fired/job trouble	Y24	Binary	−0.11	0.16	0.477	[−0.42, 0.2]
Event: new job	Y24	Binary	0.13	0.15	0.375	[−0.16, 0.43]
Self-report income	Y24	Log-trans.	−0.22	0.23	0.330	[−0.68, 0.23]
O*NET career income	Y24	Log-trans.	0.02	0.06	0.663	[−0.09, 0.13]
Income versus peers	Y24	Log-trans.	−0.09	0.08	0.220	[−0.25, 0.06]
O*NET realistic	Y24	Std.	0.06	0.07	0.409	[−0.08, 0.20]
O*NET investigative	Y24	Std.	0.05	0.07	0.493	[−0.09, 0.19]
O*NET artistic	Y24	Std.	−0.02	0.07	0.803	[−0.16, 0.12]
O*NET social	Y24	Std.	0.06	0.07	0.406	[−0.08, 0.20]
O*NET enterprising	Y24	Std.	−0.05	0.07	0.522	[−0.19, 0.09]
O*NET conventional	Y24	Std.	−0.14*	0.07	0.050	[−0.28, 0.00]

* = $p < .05$. ** = $p < .01$. *** = $p < .001$.

Openness levels predicted Y24 job satisfaction ($B = 0.24$, $p < 0.001$, 95% CI [0.10, 0.38]) and employment in less conventional jobs as rated by the O*NET classification ($B = -0.14$, $p = 0.050$, 95% CI [−0.28, 0.00]). Contrary to our hypotheses, we found little evidence that Openness levels predicted job mobility or devaluation of traditional metrics of career success.

4.3 | Openness and love

We next examined the extent to which levels of Openness were associated with 14 love-related outcomes. Each of these models fit the data acceptably (CFI ≥ 0.91 , RMSEA ≤ 0.07). As with work outcomes, we found few

associations between Openness and love outcomes (Table 3); only one of 14 tested associations emerged as significant. Specifically, those scoring higher on Openness more highly valued the role of romantic partner at Y4 compared to the other four roles ($B = 0.15$, $p = 0.018$, 95% CI [0.03, 0.27]). Contrary to our hypotheses, levels of Openness were not associated with uncommitted relationship status in college or later in life.

4.4 | Developmental associations

We next tested whether change in Openness across the study period was associated with Y24 outcomes, over and above Openness levels, by estimating an extension of the latent growth curve model with each outcome variable regressed on both the Openness level and slope (see Figure 1). Of the 33 love- and work-related outcomes assessed at Y24, 7 associations emerged as significant ($B > 0.20$ or $p < 0.05$). We present the results of these analyses in Table 4.

Regarding work, increases in Openness were associated with decreased subjective importance of job salary ($B = -0.24$, $p = 0.027$, 95% CI [-0.46, -0.02]), increased likelihood of having financial problems ($B = 0.23$, $p = 0.122$, 95% CI [-0.10, 0.87]), and employment in jobs rated as artistic (B

$= 0.29$, $p = 0.005$, 95% CI [0.09, 0.49]) and less enterprising ($B = -0.20$, $p = 0.048$, 95% CI [-0.40, -0.00]).

Regarding love, increases in Openness were associated with a decreased likelihood of being married ($b = -0.52$, $p = 0.020$, 95% CI [-0.96, -0.08]), a decreased likelihood of having children ($b = -0.40$, $p = < 0.001$, 95% CI [-0.54, -0.26]), and having fewer children ($b = -0.48$, $p = 0.012$, 95% CI [-0.86, -0.10]).

4.5 | Facet-level associations

In our final set of analyses, we tested whether the associations between Openness and outcomes differed across facets. To do this, we extended the trivariate facet-level latent growth curve models, described above, by regressing each outcome variable on the latent aesthetics level, intellect level, and unconventionality level (see Figure 3). These models allowed us to estimate the unique predictive power of each facet when controlling for the other two facets.³ For each outcome, we compared the fit of a freed model, in which the three facet-outcome associations were freely estimated, with the fit of a nested constrained model, in which the three facet-outcome associations were constrained to be equal. We conducted comparisons using a χ^2 difference test with a cut-off

TABLE 3 Associations between levels of Openness and love domain outcomes

Parameter	Time	Variable type	Association	SE	<i>p</i>	95% CI
Relationship status	Y1	Binary	-0.02	0.10	0.839	[-0.21, 0.17]
Relationship status	Y4	Binary	0.08	0.12	0.484	[-0.15, 0.31]
ID Import: friend	Y4	Std.	0.09	0.07	0.165	[-0.05, 0.23]
ID Import: son/daughter	Y4	Std.	0.02	0.06	0.768	[-0.10, 0.14]
ID Import: romantic part.	Y4	Std.	0.15*	0.06	0.018	[0.03, 0.27]
Conflict between roles	Y4	Std.	0.03	0.06	0.606	[-0.09, 0.15]
Relationship status	Y24	Binary	-0.01	0.15	0.930	[-0.3, 0.28]
Married	Y24	Binary	-0.16	0.14	0.257	[-0.43, 0.11]
Divorced	Y24	Binary	0.32	0.22	0.157	[-0.12, 0.76]
Number of children	Y24	Unstd.	-0.03	0.12	0.782	[-0.28, 0.21]
Has children	Y24	Binary	-0.01	0.02	0.530	[-0.06, 0.03]
Relationship satisfaction	Y24	Std.	0.12	0.07	0.088	[-0.02, 0.26]
Event: new relationship	Y24	Binary	0.18	0.13	0.183	[-0.08, 0.43]
Event: breakup	Y24	Binary	0.18	0.14	0.189	[-0.09, 0.45]

* = $p < .05$.

TABLE 4 Associations between change in Openness and work/love outcomes

Parameter	Variable type	Association	SE	<i>p</i>	95% CI
<i>Work</i>					
Educational attainment	Std.	0.03	0.09	0.785	[−0.15, 0.21]
Employed	Binary	−0.33	0.33	0.310	[−0.97, 0.31]
Years at job	Unstd.	−1.33	0.91	0.143	[−3.11, 0.45]
Number of jobs	Unstd.	1.10	0.75	0.146	[−0.38, 2.57]
Job satisfaction	Std.	−0.03	0.10	0.803	[−0.23, 0.17]
Work hours	Std.	−0.04	0.10	0.699	[−0.24, 0.16]
Promotion worry	Std.	0.03	0.10	0.792	[−0.17, 0.23]
Work matters to ID	Std.	0.01	0.10	0.914	[−0.19, 0.21]
Care about salary	Std.	−0.24*	0.11	0.027	[−0.46, −0.02]
Care about job prestige	Std.	0.04	0.09	0.697	[−0.14, 0.22]
Event: change career	Binary	0.27	0.24	0.262	[−0.20, 0.73]
Event: move job	Binary	0.32	0.22	0.144	[−0.11, 0.75]
Event: fail project	Binary	0.17	0.27	0.530	[−0.36, 0.70]
Event: \$ problems	Binary	0.38	0.25	0.122	[−0.10, 0.87]
Event: fired/job trouble	Binary	0.29	0.25	0.241	[−0.19, 0.77]
Event: new job	Binary	0.00	0.21	0.984	[−0.42, 0.42]
Self-report Income	Log-Trans.	−0.64	0.36	0.078	[−1.35, 0.07]
O*NET career income	Log-Trans.	−0.11	0.09	0.228	[−0.28, 0.07]
Income versus peers	Log-Trans.	−0.21	0.12	0.068	[−0.44, 0.02]
O*NET realistic	Std.	0.07	0.10	0.483	[−0.13, 0.27]
O*NET investigative	Std.	0.01	0.10	0.883	[−0.19, 0.21]
O*NET artistic	Std.	0.29**	0.10	0.005	[0.09, 0.49]
O*NET social	Std.	0.03	0.10	0.758	[−0.17, 0.23]
O*NET enterprising	Std.	−0.20*	0.10	0.048	[−0.40, 0.00]
O*NET conventional	Std.	−0.18	0.11	0.089	[−0.40, 0.04]
<i>Love</i>					
Relationship status	Binary	−0.21	0.26	0.419	[−0.71, 0.29]
Married	Binary	−0.52*	0.22	0.020	[−0.96, −0.08]
Divorced	Binary	0.29	0.5	0.565	[−0.69, 1.27]
Has children	Unstd.	−0.48*	0.19	0.012	[−0.86, −0.1]
Number of children	Binary	−0.40***	0.07	<0.001	[−0.54, −0.26]
Relationship satisfaction	Std.	−0.02	0.10	0.871	[−0.22, 0.18]
Event: new relationship	Binary	0.17	0.21	0.408	[−0.23, 0.58]
Event: breakup	Binary	0.33	0.21	0.120	[−0.08, 0.74]

* = $p < .05$. ** = $p < .01$. *** = $p < .001$.

of $p < 0.05$. When a model comparison test indicated that the constrained model fit significantly worse to the data, we interpreted this as evidence for differential facet-level associations for that outcome. We also conducted these analyses without controlling for the other two facets (see Table S6 for latent facet-outcome correlations). These analyses led to a similar pattern of results, albeit with fewer facet-level discrepancies. This suggests that some of the differential

associations between facets and outcomes are a result of variance unique to each facet.

Overall, 17 of the 51 models indicated differential facet-level associations: 14 in the work domain and 3 in the love domain (see Table S5 for results of all model comparison tests). We visualize these outcomes in Figure 4 and summarize the directionality of findings here (abbreviations as follows: intellectual interests = I, aesthetic interests = A,

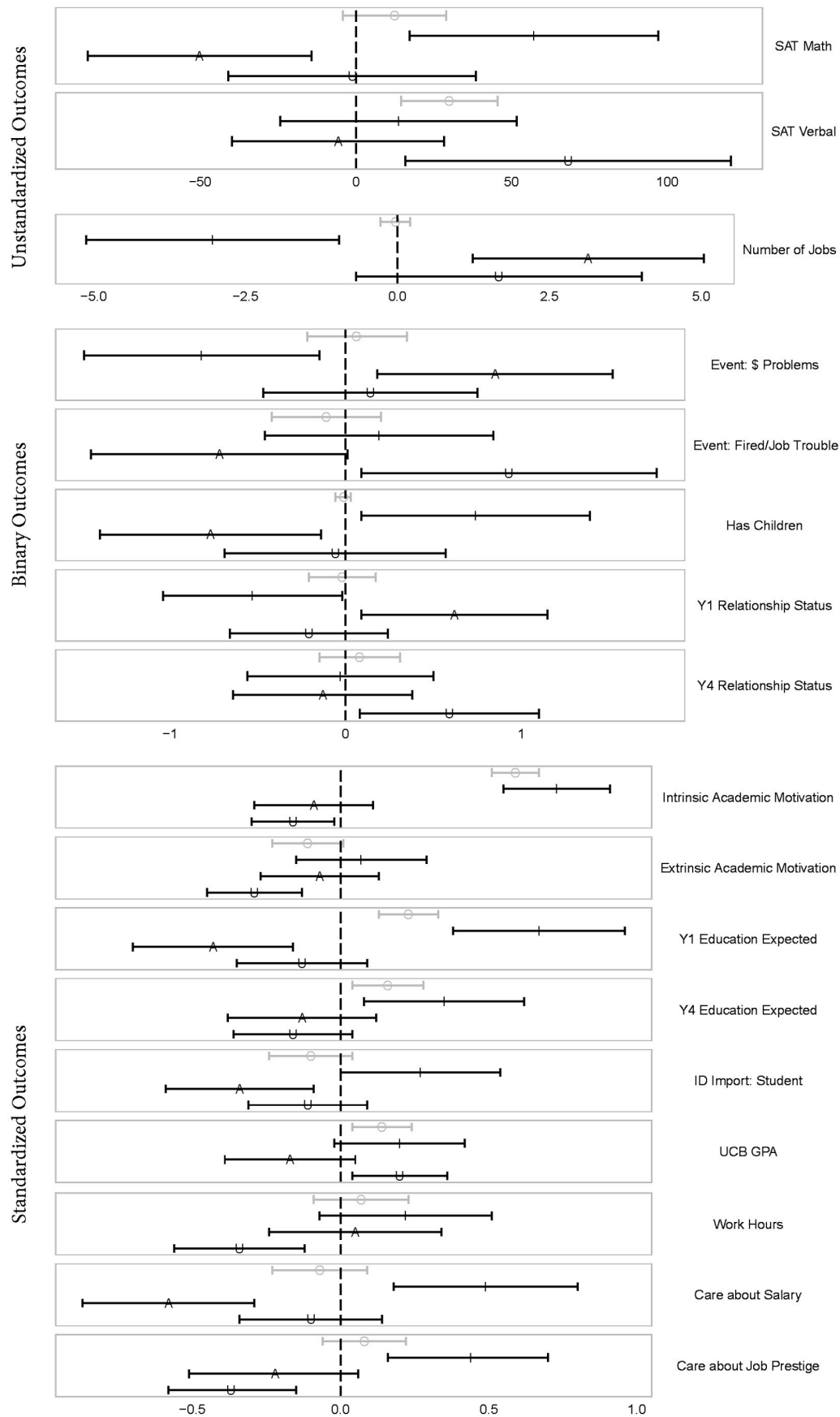


FIGURE 4 Differential associations between facet levels and outcomes

unconventionality = U; + = significant positive association with outcome, – = significant negative association with outcome, null = nonsignificant association with outcome).

Regarding education, we found differential associations for SAT math scores (I +, A –, U null), SAT verbal scores (I null, A null, U +), Y1 intrinsic academic motivation (I +, A null, U –), Y1 extrinsic academic motivation (I null, A null, U –), Y1 expected educational attainment (I +, A –, U null), Y4 expected educational attainment (I +, A null, U null), Y4 student role valuation (I +, A –, U null), and cumulative UCB GPA (I null, A null, U +). Regarding career outcomes, we found differential associations between number of jobs (I –, A +, U null), work hours (I +, A null, U –), importance of job salary (I +, A –, U null), importance of job prestige (I +, A null, U –), and tendency to experience the following events in the past 10 years: financial difficulties (I –, A +, U null) and being fired (I null, A –, U +). Regarding love, we found differential associations between Y1 relationship status (I –, A +, U null), Y4 relationship status (I null, A null, U +), and Y24 likelihood of having children (I +, A –, U null).⁴

5 | DISCUSSION

In this exploratory study, we sought to clarify and extend our understanding of the relevance of Openness to love and work using longitudinal data on a cohort of students followed from their first year of college into midlife. To do this, we (a) examined the associations between the levels of Openness and a broad set of specific and theoretically relevant outcomes, (b) examined how change in Openness across young and middle adulthood was associated with these outcomes, and (c) tested whether three facets of Openness were differentially associated with these outcomes. Although Openness *levels* predicted few love and work outcomes, we found that Openness *change* was associated with enhanced personality-job fit, decreased emphasis on extrinsic rewards such as salary, and delayed commitment to romantic relationships. Furthermore, we found several differential facet-level associations: aesthetic interests and unconventionality were more relevant to nontraditional career choices and motivations, whereas intellectual interests were more relevant to educational outcomes. In what follows, we discuss how these associations inform our understanding of the relevance of Openness to love and work.

5.1 | Few associations between stable Openness levels and outcomes

We hypothesized that Openness levels may be associated with the experiences of love and work life that reflect curiosity, autonomy, and exploration. We found little support for this hypothesis. Levels of Openness were mostly

unassociated with love and work outcomes, even those that exemplify qualities of Openness (such as switching careers). Nonetheless, consistent with past research (Busato, Prins, Elshout, & Hamaker, 2000; von Stumm et al., 2011), stable levels of Openness were strongly related to various educational outcomes.

5.2 | Change in Openness and work and love outcomes

In contrast to the few associations with Openness *levels* described above, we found that love and work experiences were more consistently associated with *change* in Openness. Participants who increased more on Openness across the study period than their peers tended to be employed in more artistic and less enterprising jobs. They also reported more financial problems and indicated that salary mattered less to them overall.

These results may reflect either direction of temporal influence. First, it may be that individuals who increased in Openness were more likely to identify ways to express their personality through their career and felt stronger motivation to follow these intrinsically motivated career paths (De Fruyt & Mervielde, 1997; Obschonka et al., 2014; Wille & De Fruyt, 2014). Alternatively, it may be that employment in Openness-related careers led to subsequent increases in Openness (Hudson & Roberts, 2016).

Change in Openness was also relevant to love outcomes. Past theory and research has suggested that open people tend to delay commitment to love-related roles like spouse and parent (Jokela et al., 2011; van Scheppingen et al., 2016). Consistent with this, we found that increases in Openness were associated with a decreased likelihood of marriage and childbirth. This finding may indicate a corresponsive association between Openness and romantic commitment, such that those who experience more pronounced increases in Openness throughout emerging adulthood may be more likely to prioritize exploration (of various romantic relationships, lifestyles, and experiences) over romantic commitment (Bleidorn & Schwaba, 2016; Luyckx et al., 2006). An alternative explanation is that the value of exploring new romantic relationships, identities, and experience typically declines after people marry and have children. As such, Openness may decline *after* romantic commitment (Bleidorn et al., 2013; Specht et al., 2011).

Overall, examining the developmental associations between Openness and life outcomes allowed us to identify a consistent pattern of associations that would have gone undetected by restricting the analyses to stable trait levels. Compared to the few significant results associating Openness levels with work and love outcomes, these findings indicate that the relevance of Openness to work and love may be more accurately assessed through longitudinal investigations that track changes in Openness over time, as emerging adults

explore and commit to adult roles. Future research including more frequent assessment waves can improve on the present findings by investigating whether Openness change precedes or follows these love and work experiences.

5.3 | Differential facet-level associations

We found that many associations between Openness and outcomes differed at the facet level, especially in the domains of education and work. Regarding education, variance unique to intellectual interests was more highly associated with academic engagement variables than other facets. Along with past research, these results suggest that those with a “hungry mind” are especially engaged in college (von Stumm et al., 2011). Regarding career outcomes, the results indicated that variance unique to unconventionality and aesthetic interests was predictive of exploratory, nontraditional career trajectories (e.g. more jobs, more financial difficulties, fewer work hours per week), while variance unique to intellectual interests was predictive of relatively stable, traditional trajectories (e.g. fewer jobs, caring more about salary and job prestige).

These results suggest that meaningful facet-level discrepancies may occur when studying the relevance of Openness to education and career outcomes. Given that different Openness measures contain different facets, and that there is no agreed-upon taxonomy of personality at the facet level (c.f. Woo, Chernyshenko, Longley et al., 2014), researchers should pay special attention to the facets that compose their Openness measures and conduct facet-level investigations whenever possible to improve our understanding of the love and work consequences of Openness.

5.4 | Limitations

By following a cohort of college students from the beginning of college into midlife, the BLS data set afforded us a unique opportunity to examine the predictive power of Openness in the domains of love and work. However, these data also come with important limitations. First, due to the initial sample size and attrition, this study did not have sufficient power to detect small associations between Openness and outcomes. To address this issue as transparently as possible, we calculated statistical power to detect various effect sizes, reported confidence intervals around all findings, and focused on the patterns of the results rather than individual point estimates. However, we note that there is no substitute for the precise estimates obtained from larger, well-powered studies with numerous waves of data.

Furthermore, there are constraints on generalizability that come from research that samples students from an elite university. Baseline Openness scores in this sample were higher than the college-age norms reported in the NEO-FFI 1992 manual ($t(868.9) = 8.83, p < 0.001, d = 0.59$; Costa &

McCrae, 1992). Despite this difference in means, estimates of variance in Openness were similar between this sample and the 1992 norms, allaying potential concerns about range restriction in this study.

6 | CONCLUSION: WHAT IS THE VALUE OF OPENNESS?

If, as Freud said, “Love and work ... work and love, that’s all there is,” (Erikson, 1963), what, then, is the value of Openness? Beyond its importance in other domains of life like politics (Jost et al., 2003), leisure (Schwaba et al., 2018), and religion (Gebauer et al., 2014), our results suggest that the value of Openness may be revealed when considering trait development across emerging adulthood as well as the underlying facets of Openness. In this study, those who experienced more pronounced increases in Openness tended to delay romantic commitment, put less emphasis on extrinsic rewards such as salary, and had increased person-job fit in midlife. At the facet level, intellectual interests were especially predictive of positive educational outcomes, while aesthetic interests and unconventionality predicted winding, autonomous career paths. We conclude that Openness *does* matter in love and work. But, rather than stable levels of Openness, the particular ways in which a person is open (intellectually, unconventionally, or artistically) and how their Openness changes across emerging adulthood seem to be the factors most relevant to love and work outcomes.

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CONFLICT OF INTERESTS

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ENDNOTES

¹These facets use 10 of the 12 openness items. The other two items (“I often try new and foreign foods” and “I seldom notice the different moods or feelings that different environments produce”) were omitted for all analyses (cf. Ziegler, Danay, Heene, Asendorpf, & Bühner 2012). We present the descriptive statistics for openness and its facets in Table 1.

²These power estimates are based on predicting Y24 outcomes. As the sample size was larger for Y1 and Y4 outcomes (see Table 1), we had considerably more power to detect these associations than simulation estimates indicated.

³These estimates are thus sensitive to collinearity between the three facets. However, latent levels of the facets, composed of the common

variance across the three measurement occasions, were not highly correlated (see Table S3).

⁴We also tested whether facet-level changes were differentially associated with Y24 outcomes. To do this, we estimated a set of models similar to the facet-level models described above. In these models, each outcome variable was also regressed on the latent change parameter for each facet. We tested change in model fit when constraining these three regression parameters to be equal. We found no evidence for differential associations between facet development and outcomes (all χ^2 values < 4.93 , $p > 0.05$). We hesitate to draw strong conclusions from this pattern of null findings; in this model, each outcome was predicted by six facet levels and slopes combined, heavily reducing our power to detect differential associations.

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