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**Abstract**

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Openness to Experience has been shown to subsume two Aspects called Openness and Intellect. The aim of this study was to examine the discriminant validity of Openness and Intellect in their relationship to Values, Interests, and Major Life Goals. Participants were 893 adults recruited into three studies who completed an online survey consisting of the Big Five Aspect Scales, Schwartz's Values, Holland's Interests, and Major Life Goals. Openness positively predicted Universalism Values in Study 1, and both Artistic Interests and Aesthetic Major Life Goals in all three samples. In contrast, Intellect was not significantly predictive of Values, Interests and Major Life Goals in any of the three studies. The implications of these findings for the discriminant validity of the two aspects are discussed.

**Abstract Word Count:** 123

**Keywords:** personality; big five aspects; Openness/Intellect; discriminant validity; values circumplex; vocational interests; major life goals; motivation

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## 1. Introduction

Of the five domains that comprise the five-factor model (John, Naumann, & Soto, 2008; McCrae & Costa, 1997; Saucier & Goldberg, 1996), arguably the most persistent debate has occurred around the label of the fifth factor. The most widely used label at present is Openness to Experience (DeYoung, Quilty, Peterson, & Gray, 2014). The compound label of Openness/Intellect is also used, reflecting the finding that Openness and Intellect are two separate but correlated traits of the same higher order domain (Jang, Livesley, Angleitner, Riemann, & Vernon, 2002; Johnson, 1994; Saucier, 1992). Examining the results of factor analyses including both the NEO-PI-R and the AB5C measures of the Big Five, DeYoung, Quilty, and Peterson (2007) identified Openness and Intellect as two distinct aspects of the fifth factor. Throughout this article, we refer to the fifth factor of personality by the compound label Openness/Intellect, to reflect both of these two separate aspects.

Openness/Intellect describes the general tendency to be imaginative, curious, perceptive, artistic, and intellectual (DeYoung et al., 2007). Intellect appears to reflect engagement primarily with abstract or semantic information. An individual high on Intellect might be described as intelligent, philosophical, erudite, and clever. Openness appears to reflect engagement primarily with perceptual or sensory information. Individuals high on Openness have been described as artistic, perceptive, and poetic. Both Openness and Intellect are dispositional traits reflecting a tendency to show consistency in thoughts, feelings, and actions (McCrae & Costa, 2008). These two aspects underlie the fifth domain of the five-factor model (FFM), which also includes Neuroticism, Extraversion, Agreeableness, and Conscientiousness (John et al., 2008). The FFM adopts a dispositional theory of traits, which is supported by the strong predictive validity of the five trait dimensions in a series of consequential life outcomes (McAdams & Pals, 2006; Ozer & Benet-Martinez, 2006), a series of neurological, biological and genetic correlates (de Moor et al., 2012; Terracciano et

41 al., 2010), and considerable stability in adulthood (Terracciano, McCrae, Brant, & Costa,  
42 2005). In this paper, and consistent with these findings, both Openness and Intellect are  
43 treated as dispositional predictors of the remaining constructs.

44         Some evidence of these two separate but related constructs having been established, a  
45 remaining concern is whether discriminant validity can be demonstrated. DeYoung and  
46 colleagues (DeYoung, 2010; DeYoung et al., 2011; DeYoung, Shamosh, Green, Braver, &  
47 Gray, 2009), among others (Jang et al., 2002; Jang, McCrae, Angleitner, Rainer, & Livesley,  
48 1998; Jung, Grazioplene, Caprihan, Chavez, & Haier, 2010), have contributed to our  
49 knowledge of the neurobiological sources and the cognitive correlates of both Openness and  
50 Intellect (Ashton, Lee, Vernon, & Jang, 2000; DeYoung et al., 2011; DeYoung, Grazioplene,  
51 & Peterson, 2012; DeYoung et al., 2009; Jung et al., 2010; Kaufman et al., 2010; McCrae,  
52 1987; Moutafi, Furnham, & Crump, 2006; Nusbaum & Silvia, 2011; Peterson & Carson,  
53 2000; Peterson, Smith, & Carson, 2002; Schretlen, van der Hulst, Pearlson, & Gordon, 2010).  
54 For example, DeYoung et al. (2009) found that brain activity associated with working  
55 memory was correlated with Intellect, but not Openness. Nusbaum and Silvia (2011)  
56 demonstrated in a group of adults that Openness significantly predicted creativity but not  
57 fluid intelligence, whereas Intellect predicted fluid intelligence but not creativity. The  
58 evidence from these studies suggest that we can distinguish between Openness and Intellect  
59 using neurobiological indicators and cognitive abilities.

60         Openness/Intellect also has implications for the intention to act in certain ways. A  
61 recent study in 168 non-indigenous Australians found that Openness/Intellect predicted the  
62 intention to engage in bystander support of Indigenous Australians subjected to racist  
63 comments (Redmond, Pedersen, & Paradies, 2014). Openness/Intellect is also positively  
64 associated with academic motivation (Önder, Beşoluk, İskender, Masal, & Demirhan, 2014),  
65 student self-reported engagement in studies (Douglas, Bore, & Munro, 2015), the motivation

66 to engage in exercise behaviours (Nikbakhsh, Azadeh, & Nasrin, 2014), and the propensity to  
67 engage in political protest (Brandstätter & Opp, 2014).

68 Many theories of personality structure and function address the role of intentional and  
69 motivational states in generating behaviour (Cattell, 1957; Mayer & Korogodsky, 2011;  
70 McAdams & Pals, 2006; Shoda & Mischel, 2000). According to the FFM, stable traits such  
71 as Openness and Intellect form the foundation from which more complex, flexible, and  
72 functional personality components develop with continued environmental input (Costa &  
73 McCrae, 1994). These more flexible personality components are referred to as Characteristic  
74 Adaptations, and can also be considered the motivational, social-cognitive, and  
75 developmental adaptations of dispositional traits. An individual's guiding principles about  
76 how they ought to behave, the kinds of occupations they are drawn to, and their aspirations to  
77 shape their lives in particular directions can be considered Characteristic Adaptations that are  
78 likely to be affected by traits such as Openness and Intellect. We sought to explore the  
79 discriminant validity of Openness and Intellect in the prediction of an individuals' Values  
80 (Schwartz & Bilsky, 1987), vocational Interests (Holland, 1959), and Major Life Goals  
81 (Roberts & Robins, 2000). Such constructs can be viewed as the motivational, socio-  
82 cognitive adaptations of dispositional traits (Olesen, 2011; Olesen, Thomsen, Schnieber, &  
83 Tonnesvang, 2010). Demonstrating the discriminant validity of Openness and Intellect  
84 beyond their neurobiological bases will establish the consequences of both these traits for  
85 how people think, feel and act on their environment in ways consistent with these traits.

## 86 **1.1. Three Motivational Consequences of Traits**

87 **1.1.1. Values.** Values can be defined as guiding principles about how individuals  
88 ought to behave (Parks & Guay, 2009). The dominant taxonomy of values in the research  
89 literature is that posited by Schwartz and colleagues (Schwartz, 1992, 2011; Schwartz &  
90 Bardi, 2001; Schwartz & Bilsky, 1987, 1990; Schwartz et al., 2001), who demonstrated that

91 values occur in a circumplex structure, with more highly positively correlated values located  
92 closer together, and opposing (negatively related) values located opposite one another.  
93 Schwartz found that the values clustered into ten types that were subsequently labelled  
94 Power, Achievement, Hedonism, Stimulation, Self-Direction, Universalism, Benevolence,  
95 Conformity, Tradition, and Security.

96 A recent meta-analysis established that Openness/Intellect was positively associated  
97 with Stimulation, Self-Direction, and Universalism values (Parks-Leduc, Feldman, & Bardi,  
98 2015). This indicates that individuals higher on this trait value exciting life experiences,  
99 independent thought and the freedom to explore, and the protection of the welfare of all  
100 people and the environment (Schwartz & Bardi, 2001). Individuals higher on  
101 Openness/Intellect were less likely to endorse Conformity, Tradition, and Security values  
102 (Parks-Leduc et al., 2015). This indicated that individuals higher on Openness/Intellect were  
103 more likely to violate social expectations and norms, have a lack of respect and acceptance  
104 for traditional ideas and customs, and place less value on national security and the stability of  
105 society respectively (Schwartz & Bardi, 2001).

106 It is clear from the above meta-analysis that the Openness/Intellect domain shares  
107 associations with values, but it is not clear how Openness and Intellect will be separately  
108 associated with the likelihood of endorsing certain values. Examination of research  
109 associating the Openness/Intellect facets with values might provide some clues. DeYoung et  
110 al. (2007) showed that seven of the nine facets from the AB5C-IPIP measure (Hofstee, de  
111 Raad, & Goldberg, 1992) had their highest loadings on the Intellect aspect, whereas five of  
112 the six NEO-PI-R facets (Costa & McCrae, 1992) marked the Openness aspect. Of the NEO-  
113 PI-R facets of Openness/Intellect, only Ideas loaded onto Intellect, whereas Fantasy,  
114 Aesthetics, Feelings, Actions, and Values all loaded onto Openness (DeYoung et al., 2007).  
115 This means that research investigating the association between the AB5C-IPIP measure gives

116 us clues about the potential relationships with Intellect, while the NEO-PI-R facets tell us  
117 more about the potential associations with Openness.

118         Olver and Mooradian (2003) investigated the associations between the ten values and  
119 both the 60-item NEO-FFI (Costa & McCrae, 1992) and Saucier's (1994) 40-adjective mini-  
120 markers. Both measures of Openness/Intellect were positively associated with Universalism,  
121 Benevolence, Stimulation, and Self-Direction values. The NEO-FFI measure of Openness  
122 was negatively related to Conformity, while the mini-marker measure was not. Saroglou and  
123 Muniz-Garcia (2008) investigated the association of NEO-PI-R facets and values with  
124 religiosity. They found that Ideas, the only facet marker of Intellect from the NEO-PI-R, was  
125 the only facet to be significantly and negatively associated with Security values, the tendency  
126 to value national and family stability. In contrast, Roccas, Sagiv, Schwartz and Knafo (2002)  
127 found that multiple facets of Openness/Intellect from the NEO-PI-R were negatively  
128 associated with Security values. From these findings with the facet measures, Openness  
129 might be negatively associated with Conformity, corresponding to a restraint of actions likely  
130 to violate social expectations and norms, in contrast to Intellect which might be negatively  
131 associated with the tendency to value the stability of societal structures, or Security Values.  
132 More clarity around the discriminant association of Openness and Intellect with Values is  
133 clearly needed, however our tentative hypothesis is as follows:

134         **H1:** Controlling for the other aspect of Openness/Intellect, Openness will be  
135 negatively and significantly associated with Conformity Values, while Intellect will be  
136 negatively related to Security Values.

137         **1.1.2. Interests.** Holland's RIASEC model consists of six vocational interest types  
138 labelled Realistic, Investigative, Artistic, Social, Enterprising, and Conventional (Holland,  
139 1959), and is designed to explain choice of vocation as an expression of personality (Larson,  
140 Rottinghaus, & Borgen, 2002). The model incorporates relationships with Openness/Intellect

141 (Costa, McCrae, & Holland, 1984; Gottfredson, Jones, & Holland, 1993). A meta-analysis  
142 conducted by Larson et al. (2002) indicated that Openness/Intellect was primarily associated  
143 with Artistic and Investigative Interests. Individuals with a high preference for Artistic  
144 Interests prefer dealing with environmental problems through self-expression in artistic  
145 media, and gravitate towards being artists, musicians, writers, or dancers. Individuals with a  
146 strong Investigative orientation prefer to think through problems, and have a marked need to  
147 observe and understand the world. Individuals high on Investigative Interests typically  
148 indicate a preference for scientific occupations (Ackerman & Heggestad, 1997).

149         Studies examining the relationship between Interests and the facets of the NEO-PI-R  
150 reveal the potential for Openness and Intellect to have different correlates. Larson and Borgen  
151 (2002) investigated the convergence between vocational interests measured with the Strong  
152 Interest Inventory (Hansen & Campbell, 1985) and the NEO-PI-R in a group of 323 gifted  
153 adolescents. They found that Ideas, the only facet to load on Intellect (DeYoung et al., 2007),  
154 was the only facet strongly and positively associated with Investigative Interests. In contrast,  
155 all facets but Values were positively related to Artistic Interests. In a further test of this  
156 finding, Sullivan and Hansen (2004) examined whether the association between  
157 Openness/Intellect and Artistic and Investigative Interests could be accounted for by  
158 particular facets. They found that there was a positive correlation between Aesthetics and  
159 Artistic Interests, that once controlled for accounted for the association between  
160 Openness/Intellect and Artistic Interests. Sullivan and Hansen also showed that there was a  
161 positive association between the Ideas facet of Openness/Intellect and Investigative Interests,  
162 despite there being a non-significant association between Openness/Intellect and  
163 Investigative Interests. Perrine and Brodersen (2005) further showed that while Investigative  
164 Interests mediated the relationship between Ideas and scientific creativity, Artistic Interests  
165 mediated the association between Aesthetics and artistic creativity. Our hypothesis regarding



166 the association between Openness, Intellect, and vocational Interests was therefore as  
167 follows:

168 **H2:** Controlling for the other aspect, Openness will be associated with Artistic  
169 Interests, and Intellect will be associated with Investigative Interests.

170 **1.1.3. Major Life Goals.** Major Life Goals define a person's aspirations to shape  
171 their lives and establish general life structures such as having a family, a career, or a certain  
172 type of lifestyle (Roberts & Robins, 2000). Major Life Goals are the motivational constructs  
173 that inspire the direction of human action (Pervin, 1994; Roberts & Robins, 2000). Roberts  
174 and Robins used value domains to construct a seven-component measure of Major Life  
175 Goals, grouping items into economic, aesthetic, social, relationship, political, hedonistic, and  
176 religious goals. No studies that we are aware of have examined the association between the  
177 NEO-PI-R facets and Major Life Goals, however an association has been found between  
178 Openness/Intellect and value placed on Aesthetic Life Goals (Roberts, O'Donnell, & Robins,  
179 2004; Roberts & Robins, 2000). Aesthetic Life Goals include producing good artistic work,  
180 becoming an accomplished musician, or writing good fiction and prose. The literature on  
181 Major Life Goals does not suggest a hypothesis for discriminating between Openness and  
182 Intellect, because the research with this concept has not extended to examining the trait facets  
183 or the aspects; however it does suggest that Openness will be associated with a tendency to  
184 endorse Aesthetic Life Goals.

185 **H3:** Controlling for Intellect, Openness will be positively related to Aesthetic Life  
186 Goals (Roberts & Robins, 2000).

## 187 **1.2. Patterns of relationships: The sinusoid curve**

188 According to values theory (Schwartz, 1992; Schwartz & Bilsky, 1987, 1990), if a  
189 variable is associated with a Value, this variable should also exhibit similar associations with  
190 other Values adjacent to it on the circumplex, and negative associations with Values opposite

191 to it on the circumplex. Because the Value circumplex is designed to represent a motivational  
192 continuum, related variables should have a predictable pattern of correlations with all ten  
193 Values. Parks-Leduc et al. (2015) suggested that if the correlations between a variable and  
194 Values are graphed, the subsequent line should form a sine wave, with one major peak and  
195 one major valley. The same pattern could be expected from standardised regression  
196 coefficients. Given that the vocational Interests model also forms a circumplex (Holland,  
197 1959), the same sinusoid pattern could be expected. Although the Major Life Goals scale was  
198 not constructed as a circumplex, we speculated that graphing the associations between  
199 Openness, Intellect and its constructs could still reveal the same pattern of relationships. We  
200 inferred potential discriminant relationships between Openness, Intellect, and Conformity and  
201 Security Values, Investigative and Artistic Interests, and Aesthetic Major Life Goals based on  
202 previous literature exploring the facets of Openness/Intellect. We also explored the  
203 discriminant validity of Openness and Intellect for the remaining constructs.

### 204 **1.3. The present research**

205 The aim of the following three studies was to examine the discriminant validity  
206 evidence for Openness and Intellect. Using the Schwartz Values Survey, the Computerised  
207 Interest Profiler, and the Major Life Goals Scale as measures of Values, Interests, and Major  
208 Life Goals respectively, we sought to determine whether Openness and Intellect had different  
209 consequences for the endorsement of Values, Interests and Major Life Goals.

210

## 211 **2. Study 1**

### 212 **2.1. Method**

213 **2.1.1. Participants.** Participants were 281 undergraduate psychology students (225  
214 females, 56 males, age  $M = 21.76$  years,  $SD = 6.47$ ) completing a research participation

215 requirement at a regional Australian university. Participants were reimbursed for their time  
216 with course credit for their undergraduate program in psychology.

217       **2.1.2. Measures.** Participants completed the Big Five Aspect Scales (DeYoung et al.,  
218 2007), the Schwartz Values Survey (Schwartz, 2009; Schwartz et al., 2001), the  
219 Computerised Interest Profiler (Rounds et al., 1999), and the Major Life Goals Scale (Roberts  
220 & Robins, 2000) as a part of a larger battery of tests.

221       **2.1.2.1. The Big Five Aspect Scales (BFAS; DeYoung et al., 2007).** The BFAS  
222 consisted of 100 items rated on a five-point Likert scale providing five domain and ten *aspect*  
223 scores for the Five Factor Model. An aspect is a hierarchical personality trait that is located  
224 between the domains and facets of the Big Five. Each domain has two aspects as follows:  
225 Agreeableness has the aspects of Politeness and Compassion; Conscientiousness has the  
226 aspects of Industriousness and Orderliness; Extraversion has the aspects Enthusiasm and  
227 Assertiveness, Neuroticism has the aspects Volatility and Withdrawal; and Openness/Intellect  
228 has the aspects Openness and Intellect.

229       **2.1.2.2. The Schwartz Values Survey (Schwartz, 2009).** The Schwartz Values Survey  
230 is a 57-item scale measuring ten values, designed to determine which values are important to  
231 an individual in their life. The SVS has demonstrated extensive cross-cultural validity  
232 (Schwartz et al., 2001; Schwartz, 2011). Participants rate each item on a 9-point Likert scale  
233 ranging from -1 (opposed to my values) to 7 (of supreme importance).

234       **2.1.2.3. The Computerised Interest Profiler (CIP; Rounds et al., 1999).** The  
235 Computerised Interest Profiler (CIP) is a 180-item questionnaire designed to measure  
236 Holland's RIASEC model of vocational interests (Holland, 1959). The six scales consist of  
237 thirty items each, rated on a three point Likert scale.

238       **2.1.2.4. The Major Life Goals Scale (MLGS; Roberts & Robins, 2000).** The MLGS  
239 consists of 25 goal items, rated on a five-point response scale and measuring seven major life

240 goal domains labelled Economic, Aesthetic, Social, Relationship, Political, Hedonistic, and  
241 Religious goals.

242 **2.1.3. Procedure.** Participants were recruited via a research participation system used  
243 within the university and were provided with an electronic link to access the web-  
244 administered battery. Participants were asked before commencing to seat themselves at a  
245 computer with a steady Internet signal and an environment free from interruptions. Two  
246 versions of the questionnaire battery were designed to account for possible fatigue effects.  
247 Version A had each measure in the order MLGS, BFAS, CIP, and the SVS. Half of the  
248 participants received version A of the questionnaire, and the other half received version B,  
249 which had the measures in the reverse order. The responses to all questions were downloaded  
250 into a spreadsheet for cleaning and scoring. This research was approved by the University's  
251 Human Research Ethics Committee.

252 **2.1.4. Statistical Analyses.** Missing value analysis was conducted on the data using  
253 the expectation-maximisation algorithm (Dempster, Laird, & Rubin, 1977). EM estimation  
254 was appropriate for replacing the missing data,  $\chi^2(5030) = 463.624, p > .05$  (Little, 1988).  
255 Correlations between the Values, Interests, Major Life Goals and both aspects of  
256 Openness/Intellect were conducted. We then conducted multiple linear regressions with each  
257 Value, Interest, and Major Life Goal as the dependent variable and Age, Gender, and both  
258 Openness and Intellect as independent variables. Because multiple regressions were run an  
259 alpha level of .001 per test was used to control for the proportion of false positives in multiple  
260 dependent tests (Colquhoun, 2014; Fernando et al., 2004; Johnson, 2013). The resultant effect  
261 sizes were interpreted using the guidelines reported by Ferguson (2009). Under these  
262 guidelines, an effect size of  $R^2 = .04$  is the recommended minimum effect size representing a  
263 practically significant effect, with .25 representing a moderate effect. In this study we  
264 interpreted  $R^2$  above .15 (between the minimum and the moderate effect sizes) as models

265 where the predictors had practical significance for the dependent variable. Using the  
266 guidelines to interpret the effect size of standardised regression weights, .20 is the minimum  
267 effect size representing a practically significant effect, with .50 corresponding to a moderate  
268 effect. All correlations and regressions were reported with these effect size guidelines in  
269 mind.

## 270 **2.2. Results and Discussion**

271 The means, standard deviations, and internal reliabilities for all scales can be found in  
272 Table 1 together with the correlations between each variable and both Openness and Intellect.  
273 Openness and Intellect were positively and moderately correlated with one another ( $r = .40, p$   
274  $< .01$ ). Small and negative correlations were observed between Intellect and Conformity,  
275 Tradition, Power, and Security Values, as well as Economic Life Goals. Intellect was  
276 significantly and positively associated with Investigative and Artistic Interests, as well as  
277 Aesthetic Life Goals. Openness shared similar associations to Intellect. Exceptions were a  
278 lack of association between Openness and Conformity Values, and weak to moderate and  
279 positive correlations with Benevolence, Universalism, and Self-Direction Values. Neither  
280 Openness nor Intellect were associated with Stimulation Values.

281 Linear regressions with each Value, Interest, and Major Life Goal as a dependent  
282 variable were then conducted. Age and Gender were entered as control variables, followed by  
283 both Openness and Intellect (see Table 2). In partial support of hypothesis 1, Openness was a  
284 negative predictor of Conformity Values, however the overall model only accounted for 5.5%  
285 of the variance. We expected Intellect to be a negative predictor of Security Values, but we  
286 instead found that Openness negatively and significantly predicted this value. The overall  
287 model only accounted for 8.9% of the variance in Security Values. Figure 1A provides a plot  
288 of the standardised regression estimates of the association between Openness, Intellect, and  
289 Values. In contrast to Intellect, Openness was a significant and positive predictor of

290 Universalism and Self-Direction Values, while it was a negative predictor of Hedonism,  
291 Achievement, and Power Values. Intellect was a positive predictor of Achievement Values.  
292 Study 1 therefore revealed partial support for the expected negative association between  
293 Openness and Conformity. However, instead of the expected negative association between  
294 Intellect and Security Values, we observed that Openness was negatively associated with  
295 Security Values. The overall model effect size did not indicate that any variable had a large  
296 impact on Security Values. Examination of Figure 1A indicated that Openness shared  
297 stronger positive relationships with Universalism and Self-Direction Values, and negative  
298 relationships with Achievement, Power, Security, and Conformity Values, while Intellect was  
299 a significant and positive predictor of Achievement Values. Only the model for Universalism  
300 Values reached our threshold for the practical significance of an effect size.

301 Figure 1B plots the relationships between Openness, Intellect, and Interests. The  
302 figure shows that Openness had a stronger relationship with Artistic Interests, and Intellect  
303 with Investigative Interests, than the other aspect respectively. This finding supported  
304 hypothesis 2, however only the model for Artistic Interests had a large enough effect size to  
305 conclude an impact from Openness. As expected, Openness was also a significant and  
306 positive predictor of Aesthetic Major Life Goals. Openness was also a negative predictor of  
307 Economic Life Goals, however only the model for Aesthetic Major Life Goals had an effect  
308 size above .15. The pattern of regression coefficients for Major Life Goals can be found in  
309 1C.

310 While the findings of Study 1 indicate support for the discriminant validity of  
311 Openness and Intellect, some methodological limitations require consideration. First, the  
312 Schwartz Values Survey might have been inappropriate for web survey administration.  
313 Examination of the alpha reliability coefficients of the ten value subscales indicated only  
314 moderate reliability. Exploratory factor analyses with all 57 items indicated a one-component

315 solution. The likely explanation for these results is that the complicated instructions using the  
316 web survey platform were a problem for participants. Schwartz et al. (2001) suggest that the  
317 Portrait Values Questionnaire (PVQ) would be better suited to web survey formats.  
318 Subsequently, in Study 2 we substituted the PVQ for the SVS.

319 A second concern was the apparent homogeneity of the undergraduate psychology  
320 student sample. This homogeneity was reflected in high agreement among our sample in the  
321 SVS value ratings as well as the CIP Interest scores. This might have affected our ability to  
322 observe further relevant relationships between Values, Interests, and Openness/Intellect. Age  
323 in this sample was highly positively skewed, suggesting that some of the observed results  
324 could have been due to the predominantly young sample. Comparison of the scores for  
325 participants completing different test administration versions also indicated the possibility of  
326 fatigue effects. We subsequently recruited a second sample from the broader undergraduate  
327 student cohort, with a shorter test battery, and using the Portrait Values Questionnaire as a  
328 measure of Values in an attempt to replicate the findings from Study 1.

### 329 3. Study 2

#### 330 3.1. Method

331 **3.1.1. Participants.** Participants were 271 undergraduate students recruited from a  
332 regional Australian university (57 males, 212 females, 2 unreported, age  $M = 23.83$ ,  $SD =$   
333  $7.98$ ). Thirteen participants (4.8%) were studying Law; 26 (10.7%) Medicine; 14 (5.2%)  
334 Nursing; 85 (31.4%) Psychology; 43 (15.9%) Social Work; and 61 (22.5%) Teaching.  
335 Twenty-nine participants (10.7%) did not report their degree program. Participants recruited  
336 from the undergraduate psychology cohort were awarded for their participation with course  
337 credit. Participants from other degree programs went into the draw to win vouchers provided  
338 by a local retailer.

339           **3.1.2. Measures.** Participants in Study 2 received the Major Life Goals scale in the  
340 same format as Study 1. The remaining three measures were adjusted as follows:

341           **3.1.2.1. The Big Five Aspect Scales – 30 items.** Comparison of individuals in Study 1  
342 who had completed the BFAS early and those who had completed it late in the web survey  
343 indicated the presence of fatigue effects. To address this issue in further studies, a principal  
344 components analysis was conducted on the BFAS items administered in Study 1 to identify  
345 the items that had the highest loading on each aspect. Evidence indicated that a three-item  
346 scale assessing each aspect was possible, with Cronbach's alphas ranging between .61 and  
347 .78. Participants in Study 2 subsequently received a 30-item version of the BFAS with three  
348 items assessing each aspect. Confirmatory factor analysis of the 30-item BFAS scales in  
349 Study 2 indicated that a three-item assessment of each aspect still provided a satisfactory fit  
350 to the data for Openness/Intellect (details available from authors).

351           **3.1.2.2. The Portrait Values Questionnaire (Schwartz et al., 2001).** Participants  
352 completed the Portrait Values Questionnaire (PVQ). The PVQ was introduced as it is  
353 specifically designed for web administration. The PVQ consists of 40 items rated on a six  
354 point Likert scale ranging from 'very much like me' (6) to 'not at all like me' (1). The PVQ  
355 consists of ten subscales measuring Benevolence, Universalism, Self-Direction, Stimulation,  
356 Hedonism, Achievement, Power, Security, Conformity, and Tradition Values. Despite low  
357 reported internal reliabilities, the PVQ indices yield good convergent and discriminant  
358 validity (Schwartz et al., 2001).

359           **3.1.2.3. The Computerised Interest Profiler – Short Form (CIP-SF).** The CIP-SF  
360 consists of 60 items taking approximately 10 minutes to complete. Six subscales tapping each  
361 of Holland's interest categories consist of ten items each, rated on a five-point Likert scale  
362 ranging from 'strongly dislike' (0) to 'strongly like' (4) (Rounds et al., 1999).



363           **3.1.3. Procedure.** Participants were provided with an electronic link to access the web  
364 survey on the recruitment poster, the information statement, and in the case of psychology  
365 students through the online recruitment system. All other web administration procedures  
366 remained unchanged from Study 1. Half the participants completed the questionnaires in the  
367 order of BFAS, PVQ, MLGS, and CIP-SF while the remaining participants completed the  
368 questionnaires in the reverse order. Approval to conduct the study was given by the  
369 University's Human Research Ethics Committee.

370           **3.1.4. Statistical Analyses.** Missing value analysis was conducted on the data using  
371 the expectation-maximisation algorithm (Dempster et al., 1977). No missing values were  
372 identified. Descriptive statistics were first examined including correlations between  
373 variables. Separate regressions were then conducted with Age and Gender entered as control  
374 variables, Openness and Intellect as predictor variables, and each of the Values, Interests, and  
375 Major Life Goals as dependent variables in turn. As per study 1, an alpha level of .001 per  
376 test was used to correct for the increased chance of a Type 1 error. Effect sizes were  
377 interpreted using the guidelines reported in Study 1.

## 378 **3.2. Results and Discussion**

379           The means, standard deviations, and internal reliabilities can be found in Table 3  
380 together with the correlations between each variable and both Openness and Intellect.  
381 Openness and Intellect shared a small and positive correlation ( $r = .14, p < .05$ ). Openness  
382 was positively associated with Benevolence, Universalism, and Self-Direction Values,  
383 Artistic and Social Interests, and Aesthetic and Social Major Life Goals. Openness was also  
384 negatively related to Economic Major Life Goals. In contrast, Intellect shared a small and  
385 positive association with Self-Direction Values and Investigative Interests only.

386           Separate linear regressions with each Value, Interest, or Major Life Goal construct as  
387 the dependent variable, Age and Gender as control variables, and Openness and Intellect as

388 predictors, were conducted. Results of these analyses can be found in Table 4. The pattern of  
389 standardised regressions for Values can be found in Figure 2A. Hypothesis 1 was partially  
390 supported, with Openness being significantly and negatively associated with Conformity  
391 Values. Intellect was not a significant predictor of Security Values. Openness was once again  
392 a significant and positive predictor of Universalism and Self-Direction Values in this study.  
393 None of the models predicting Values reached our .15 threshold for a practically significant  
394 effect size.

395         Results of the regressions for Interests indicated support for hypothesis 2. Openness  
396 was once again a positive predictor of Artistic Interests, while Intellect was a positive  
397 predictor of Investigative Interests. Openness was also positively associated with Social  
398 Interests in this study. The multiple linear regression for Investigative and Social Interests did  
399 not have a sufficiently large effect size to indicate the practical significance of Openness or  
400 Intellect. The plot of relationships between Openness, Intellect, and vocational Interests can  
401 be found in Figure 2B.

402         Openness was a strong and positive predictor of Aesthetic Major Life Goals, as  
403 hypothesised. It was also positively associated with Social and Hedonistic Major Life Goals,  
404 and negatively with Economic Major Life Goals, however none of these regressions reached  
405 the effect size threshold indicating a practical effect of Openness on any of these goals.  
406 Intellect was negatively associated with Aesthetic Major Life Goals, in contrast to Openness  
407 which was a positive predictor. This indicates that individuals in this study who were higher  
408 on Intellect were less likely to be interested in the fine or performing arts pursuits. This  
409 finding is in line with that of Perrine and Brodersen (2005), who found that the Ideas facet  
410 was a predictor of scientific rather than artistic pursuits.

411         The plot of relationships between Openness, Intellect, and Major Life Goals can be  
412 found in Figure 2C. Only the overall model for Aesthetic Major Life Goals had a large

413 enough effect size to indicate a practical impact of any predictor. In addition, the standardised  
414 regression weight for the impact of Intellect on Aesthetic Major Life Goals was not large  
415 enough to conclude that it had a practical impact. Both Studies 1 and 2 are restricted by the  
416 sample comprising solely university students. The final study investigated the discriminant  
417 validity of Openness and Intellect in a sample derived from the general working population.

## 418 **4. Study 3**

### 419 **4.1. Method**

420 **4.1.1. Participants.** Participants were 173 members of the working population from  
421 an Australian regional centre. The sample had a median age of 28 (SD = 13.26), with 120  
422 (69.4%) indicating they were female. Fifty-three participants were male (30.6%).

423 **4.1.2. Measures.** Measures in Study 2 exhibited acceptable psychometric properties  
424 and therefore remained unchanged for Study 3.

425 **4.1.3. Procedure.** Participants were recruited through a regional Australian university  
426 alumni page, and an advertisement on <http://www.gumtree.com.au>, an online local  
427 noticeboard posting advertisements about job vacancies, goods for private sale, and share  
428 house vacancies. A mail-out recruitment was also conducted in which addresses were  
429 selected at random from the local telephone directory. Finally, participants who had  
430 completed the survey had the option to nominate individuals who might also be interested in  
431 the web survey by entering their email address in the last page of the online questionnaire.  
432 This study was approved by the University's Human Research Ethics Committee.

433 **4.1.4. Statistical Analyses.** EM estimation was appropriate for replacing the missing  
434 data ( $\chi^2(8340) = 3516.169, p > .05$ ) (Little, 1988). An alpha level of .001 per test was again  
435 used, as were the guidelines for interpreting effect sizes reported in Study 1.

### 436 **4.2. Results and Discussion**

437           The means, standard deviations, and internal reliabilities for Study 3 can be found in  
438 Table 5, together with the correlations between each variable and both Openness and  
439 Intellect. Openness and Intellect did not share a significant association in this study ( $r = .11, p$   
440  $> .05$ ). Openness was positively associated with Universalism Values, Artistic Interests, and  
441 Aesthetic and Social Major Life Goals. Openness was also negatively related to Conformity  
442 Values. In contrast, Intellect was not significantly associated with any of the Values,  
443 Interests, or Major Life Goals.

444           Linear regressions were then conducted in the same manner as in Studies 1 and 2.  
445 Results of these analyses can be found in Table 6. The sinusoid pattern of standardised  
446 regressions for Values can be found in Figure 3A. None of the regressions with the Values as  
447 dependent variables satisfied the minimum effect size indicating a practical impact of the  
448 predictors. Although Conformity was negatively associated with Openness as expected, this  
449 standardised regression did not have a sufficiently large effect size to be interpreted.  
450 Openness was a significant and positive predictor of Universalism Values only. Figure 3A  
451 demonstrates the lack of significant associations between Openness, Intellect, and Values in  
452 general in this sample.

453           The pattern of standardised regression coefficients for Interests can be found in Figure  
454 3B. Only the regressions associated with Artistic and Realistic Interests met our overall effect  
455 size criterion. The only significant association between either aspect was that between  
456 Openness and Artistic Interests. Intellect was not a positive predictor of Investigative  
457 Interests. Gender was instead a significant predictor, indicating that males were more likely  
458 to endorse an interest in Investigative occupations than females in this sample.

459           In contrast to both studies 1 and 2, Intellect was not a significant predictor of any  
460 Value, Interest, or Major Life Goal. For this sample at least, individuals higher on Openness  
461 were also more likely to indicate a preference for fine arts, performing arts, and creative

462 literary pursuits, and more likely to endorse such arts as a major goal of their lives. This was  
463 the only regression for Major Life Goals that had a sufficient effect size to interpret, and is  
464 consistent with the findings of both studies 1 and 2.

## 465 **5. General Discussion**

466 Table 7 shows the pattern and valence of standardised regression coefficients across  
467 all three studies. Only those regression coefficients that demonstrated large enough effect  
468 sizes according to the guidelines of Ferguson (2009) are reported in this table. Openness was  
469 a significant and positive predictor of Artistic Interests and Aesthetic Major Life Goals in all  
470 three studies. It was also a positive predictor of Universalism Values in Study 1. In contrast,  
471 Intellect had limited associations with Values, Interests, and Major Life Goals across all three  
472 studies.

473 Across all three studies we found limited support for the hypothesis that Openness  
474 was a negative predictor of Conformity Values, and Intellect of Security Values, once the  
475 other aspect was controlled for. Openness was a negative predictor of Conformity in all three  
476 studies; however, we did not observe a large enough effect size to interpret these results in  
477 any study. Intellect was not associated with Security in any study. This was in contrast to  
478 recent research with the NEO-FFI suggesting that Openness was negatively associated with  
479 Conformity (Olver & Mooradian, 2003), and with the NEO-PI-R suggesting that Intellect was  
480 negatively associated with Security Values (Saroglou & Muniz-Garcia, 2008). We failed to  
481 find a relationship between Security Values in all three studies for both Openness and  
482 Intellect, in contrast to the findings of Roccas et al. (2002). All three of these studies were  
483 based on correlations instead of regressions controlling for the other associated traits. If a  
484 more stringent alpha level of .001 was applied as in the current studies, only the results of  
485 Olver and Mooradian (2003) demonstrated correlations between Openness/Intellect and  
486 Values that reached this threshold. However, Olver and Mooradian (2003) only examined the

487 association between the Openness/Intellect domain and the Values. Our findings instead  
488 suggest that Openness is particularly characterised by an appreciation, tolerance, and interest  
489 in the welfare of all people and of nature. Both Openness and Intellect appear to be  
490 characterised by independent thought and action, and valuing the opportunity to create and  
491 explore the world. However, none of the associations were large enough to conclude that  
492 Openness or Intellect will have a major impact on what individuals value.

493         We found partial support for Hypothesis 2. Openness was a strong and positive  
494 predictor of the likelihood of endorsing Artistic Interests. In contrast, the association between  
495 Intellect and Investigative Interests was found in Study 1 only, and in this regression the  
496 effect size was not sufficient to conclude that Intellect had any practical significance for the  
497 endorsement of Investigative Interests. Our findings in regard to Openness replicate previous  
498 research indicating that the facet of Aesthetics accounted for the association between  
499 Openness/Intellect and Artistic Interests (Perrine & Brodersen, 2005; Sullivan & Hansen,  
500 2004). We failed to demonstrate an association between Intellect and Investigative Interests  
501 in any study, in contrast to the literature indicating an association between the Ideas facet and  
502 Investigative Interests (Perrine & Brodersen, 2005; Sullivan & Hansen, 2004). The current  
503 findings suggest that an individual high on the Openness aspect will gravitate towards self-  
504 expressive pursuits, including creative, artistic, and potentially performing arts occupations.  
505 In contrast, there is limited evidence to suggest that increasing Intellect correspondingly  
506 confers a higher likelihood of preferring occupations where the need to organise and  
507 understand the world is satisfied (Ackerman & Heggestad, 1997). It is possible that only the  
508 Ideas facet is associated with the tendency to gravitate towards Investigative occupations.

509         Our hypothesis regarding Major Life Goals was largely exploratory, however strong  
510 support was found for the positive association between Openness and Aesthetic Major Life  
511 Goals in all three studies. These studies are the first that we are aware of that specifically test

512 the discriminant associations of Openness and Intellect with Major Life Goals. These  
513 findings suggest that individuals higher on Openness are more likely to endorse goals of  
514 producing good artistic work, becoming a gifted musician, or producing a high quality piece  
515 of creative writing (Roberts & Robins, 2000).

516         From both the previous literature and the findings reported here, it appears that  
517 Openness and Intellect have discriminable consequences for the individual as an intentional  
518 actor on their environment. More specifically, Intellect appears to be associated with thinking  
519 styles, intellectual engagement and intelligence, whereas Openness has wider ranging  
520 implications for subsequent motivations. In contrast to the research on neurobiological  
521 mechanisms and cognitive variables in which Intellect was a significant predictor, Openness  
522 more frequently emerged as a trait that has consequences for Values, Interests and Goals.  
523 This suggests a conceptualisation of Intellect as the intellectual engagement and Openness as  
524 the motivation, within the higher-order domain of Openness/Intellect, which reflects a  
525 tendency to explore.

526         The current series of studies provide some indication that Openness and Intellect have  
527 discriminable consequences for the things people value and choose to pursue in life. The  
528 current studies capitalise on regression rather than correlation analyses, as is typical in  
529 previous research in this field. The use of regression analyses enabled us to control for the  
530 other aspect when testing associations between Openness, Intellect, and their subsequent  
531 Values, Interests, and Major Life Goals. This allowed us to properly examine the  
532 motivational consequences of Openness while controlling for Intellect, and also the  
533 consequences of Intellect while controlling for Openness. We also used a conservative  
534 approach to interpreting our regression analyses using effect size guidelines to determine  
535 which predictors had practical significance for subsequent motivations. The use of these

536 guidelines suggests that the association between Openness and both Artistic Interests and  
537 Aesthetic Major Life Goals is likely to be a robust finding.

### 538 **5.1. Implications and Limitations**

539         The current findings suggest some implications for the influence of Openness in  
540 particular on the development of Values, Interests, and Major Life Goals over time. Across  
541 all three studies we observed that only Artistic Interests and Aesthetic Major Life Goals  
542 maintained significant and consistent associations with Openness. The three studies presented  
543 here are cross-sectional in nature, and thus do not enable us to test the change in motivations  
544 as individuals develop. However, the findings do suggest the possibility that the motivations  
545 associated with Openness might develop as a result of higher trait Openness. In particular,  
546 they support the description of Openness as individuals who are artistic and perceptive.

547         The three studies reported here had some limitations. The first was the gender  
548 imbalance in favour of women in all three samples. Although gender was controlled for in all  
549 three studies, future research might wish to consider whether Openness and Intellect have  
550 different consequences for Values, Interests, and Major Life Goals depending on gender. The  
551 second limitation was the observation of insufficient effect sizes to interpret the findings of  
552 multiple regression analyses across all three studies. However, the regression analyses that  
553 indicated substantive findings according to these effect size guidelines are more likely to be  
554 replicated. The subsequent standardised regression coefficients also indicated that  
555 associations between Openness, Intellect, and each motivational construct were small in  
556 general. However, the median effect size in psychology is only  $r = .16$  (Cafri, Kromrey, &  
557 Brannick, 2010). The regression coefficients we interpreted were typically of this magnitude  
558 or higher, indicating that although there are likely to be other factors involved in the  
559 endorsement of Values, Interests, and Major Life Goals, Openness at least appears to be an  
560 important driver of some of these motivations.



561 All three of our studies employed a cross-sectional, rather than a longitudinal design.  
562 Use of a longitudinal design in any study would have allowed us to observe the development  
563 of associations between Openness, Intellect, and their motivational constructs over time.  
564 However, the purpose of this study was not to examine the consequences of Openness and  
565 Intellect for the development of Values, Interests, and Major Life Goals. Instead, it was to  
566 determine whether Openness and Intellect could be distinguished by their associations with  
567 such motivational constructs. The use of three separate cross-sectional studies in samples  
568 with different characteristics was appropriate for this purpose. Future research might wish to  
569 consider whether the association between Openness, Intellect, and any of the Values,  
570 Interests, and Major Life Goals changes over time. Key life transitions such as starting  
571 university, entering the workforce for the first time, having a family, and so on might reveal  
572 how traits drive the things that people value and aim towards at different life stages.

## 573 **5.2. Conclusions**

574 Consistent with our predictions, it appears that Openness and Intellect have different  
575 consequences for the endorsement of Values, Interests, and Major Life Goals. Individuals  
576 higher on Openness in particular were more likely to endorse Universalism Values, Artistic  
577 Interests, and Aesthetic Life Goals. These three studies suggest the possibility that Intellect is  
578 associated more with thinking styles and intelligence, whereas Openness has greater  
579 implications for subsequent motivations. This research extends the validity of the distinction  
580 between Openness and Intellect into the domain of motivation and intentional action, making  
581 the case for measuring both aspects more compelling.

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804

805

806 Table 1  
 807 *Descriptive statistics for all variables and correlations with Openness and Intellect (Study 1)*

	Descriptives			Correlations	
	M	SD	$\alpha$	Intellect	Openness
Intellect	3.57	.58	.78		
Openness	3.70	.54	.78	.40**	
Conformity (SVS)	4.36	1.31	.75	-.18**	-.23**
Tradition (SVS)	3.29	1.46	.70	-.18**	-.14*
Benevolence (SVS)	5.25	0.99	.78	.14*	.17**
Universalism (SVS)	4.88	1.05	.79	.14*	.43**
Self-Direction (SVS)	5.09	0.88	.57	.29**	.40**
Stimulation (SVS)	4.23	1.34	.70	.09	.09
Hedonism (SVS)	4.74	1.18	.66	.02	-.14*
Achievement (SVS)	4.75	1.05	.66	.13	-.18**
Power (SVS)	2.52	1.56	.77	-.18**	-.41**
Security (SVS)	4.30	1.10	.60	-.24**	-.29*
Realistic (CIP)	3.85	5.56	.94	-.03	.04
Investigative (CIP)	13.09	7.62	.93	.27**	.16**
Artistic (CIP)	12.95	8.84	.95	.17**	.39**
Social (CIP)	17.08	7.96	.94	-.02	.02
Enterprising (CIP)	6.65	6.01	.92	-.06	-.09
Conventional (CIP)	4.47	6.39	.96	-.09	-.08
Economic Goals (MLGS)	3.40	0.73	.81	-.16**	-.21**
Aesthetic Goals (MLGS)	2.27	0.97	.81	.18**	.47**
Social Goals (MLGS)	4.08	0.82	.81	.04	.13*
Relationship Goals (MLGS)	4.44	0.67	.59	-.11	.07
Political Goals (MLGS)	2.88	1.09	.81	.00	-.09
Hedonistic Goals (MLGS)	4.46	0.58	.68	.04	.03
Religious Goals (MLGS)	2.29	1.29	.84	-.08	.14*

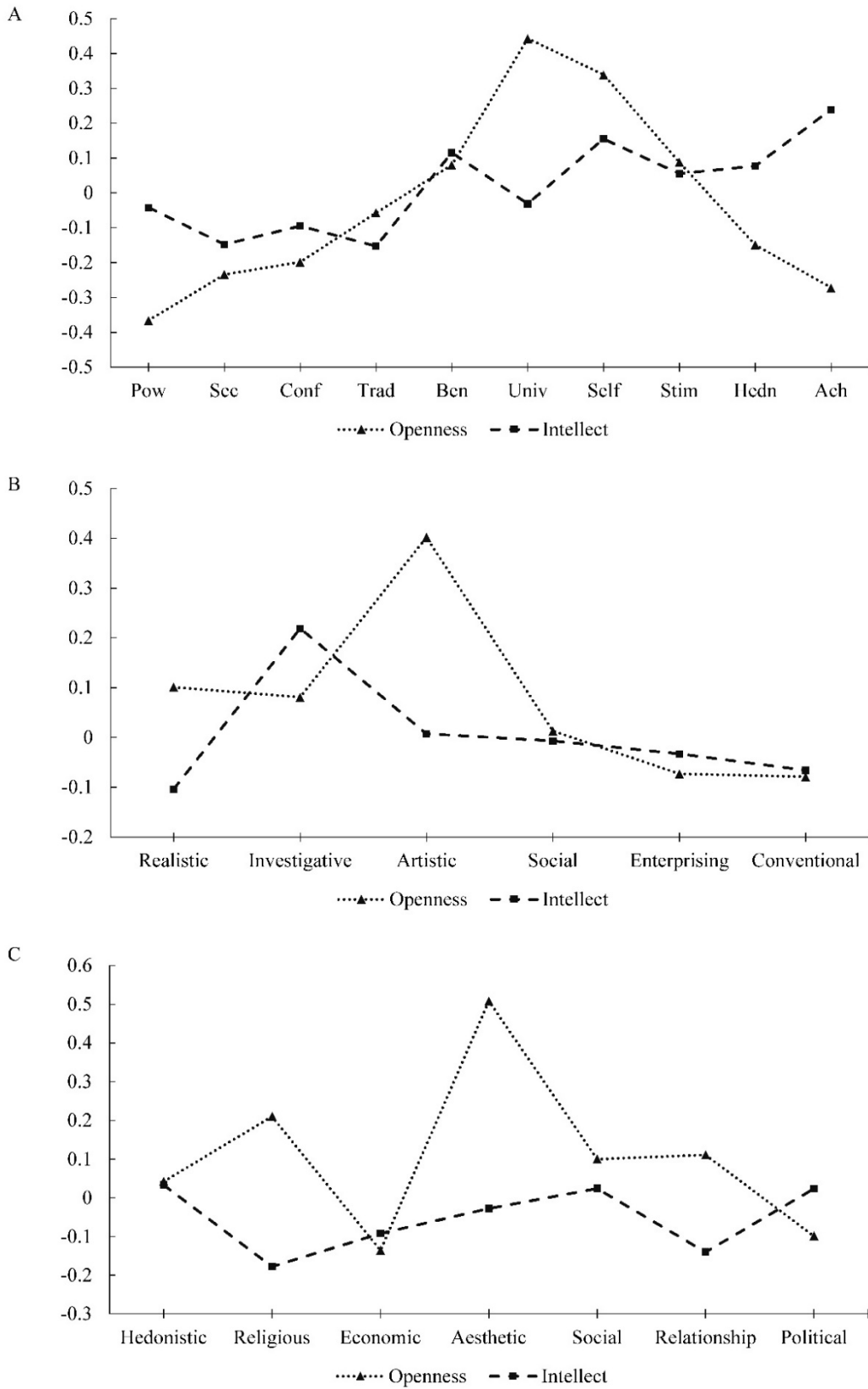
808 Notes: \* =  $p < .05$ ; \*\* =  $p < .01$ ; O = Openness/Intellect; SVS = Schwartz Values Circumplex; CIP =  
 809 Computerised Interest Profiler; MLGS = Major Life Goals Scale

810

811 Table 2.  
 812 *Linear regressions with Values, Interests, and Major Life Goals as dependent variables and*  
 813 *Age, Gender, Openness and Intellect as predictors (Study 1)*

	F (df)	<i>p</i>	R <sup>2</sup> <sub>adj</sub>	R <sup>2</sup> <sub>adj</sub> 95% CI	Age	Gender	Openness	Intellect
<b>Values</b>								
Power	15.744 (4,259)	<.001	0.184	.101 - .267	-0.066	<b>0.158</b>	<b>-0.366</b>	-0.042
Security	7.386 (4,259)	<.001	0.089	.025 - .153	0.031	-0.001	<b>-0.234</b>	-0.148
Conformity	4.825 (4,259)	0.001	0.055	.003 - .107	-0.035	-0.078	<b>-0.198</b>	-0.095
Tradition	5.250 (4,259)	<.001	0.061	.006 - .116	<b>-0.193</b>	-0.001	-0.057	-0.153
Benevolence	6.445 (4,259)	<.001	0.076	.016 - .136	<b>0.180</b>	<b>-0.152</b>	0.080	0.115
Universalism	14.523 (4,259)	<.001	0.171	.090 - .252	-0.044	-0.002	<b>0.443</b>	-0.031
Self-Direction	15.043 (4,259)	<.001	0.176	.094 - .258	0.057	0.055	<b>0.339</b>	<b>0.155</b>
Stimulation	1.805 (4,259)	0.128	0.012	-.014 - .038	-0.108	0.063	0.088	0.055
Hedonism	3.076 (4,259)	0.017	0.031	-.013 - .047	<b>-0.138</b>	0.022	<b>-0.149</b>	0.077
Achievement	5.637 (4,259)	<.001	0.066	.009 - .123	0.028	0.004	<b>-0.272</b>	<b>0.239</b>
<b>Interests</b>								
Realistic	6.782 (4,276)	<.001	0.076	.018 - .134	0.021	<b>0.297</b>	0.101	-0.104
Investigative	8.557 (4,276)	<.001	0.097	.032 - .162	0.041	<b>0.178</b>	0.081	<b>0.219</b>
Artistic	13.231 (4,276)	<.001	0.149	.074 - .224	-0.066	0.051	<b>0.402</b>	0.007
Social	1.761 (4,276)	0.137	0.011	-.013 - .035	0.017	<b>-0.154</b>	0.013	-0.007
Enterprising	.781 (4,276)	0.539	-0.003	-.001 - .001	-0.020	0.044	-0.073	-0.033
Conventional	2.339 (4,276)	0.056	0.019	-.012 - .050	<b>0.149</b>	0.012	-0.079	-0.066
<b>Major Life Goals</b>								
Hedonistic	3.139 (4,276)	0.015	0.030	-.009 - .069	<b>-0.199</b>	-0.064	0.042	0.033
Religious	3.797 (4,276)	0.005	0.038	-.005 - .081	0.063	0.066	<b>0.210</b>	<b>-0.178</b>
Economic	7.530 (4,276)	<.001	0.085	.024 - .146	<b>-0.226</b>	-0.011	<b>-0.136</b>	-0.092
Aesthetic	22.702 (4,276)	<.001	0.237	.152 - .322	<b>-0.124</b>	0.098	<b>0.508</b>	-0.028
Social	3.936 (4,276)	0.004	0.040	-.004 - .084	0.039	<b>-0.191</b>	0.100	0.024
Relationship	2.986 (4,276)	0.019	0.028	-.009 - .065	0.051	-0.111	0.111	<b>-0.140</b>
Political	1.367 (4,276)	0.246	0.005	-.011 - .021	0.053	0.091	-0.099	0.023

814 Note: Standardised regression coefficients are reported, all regressions in bold were significant at *p* <  
 815 .01; R<sup>2</sup><sub>adj</sub> = R squared adjusted; 95% CI = 95% Confidence Interval; Gender variable female was  
 816 coded 1, and male 2.



817

818 *Figure 1.* Plot of standardised multiple regression coefficients between Openness, Intellect,  
 819 and (A) Values, (B) Interests, and (C) Major Life Goals in Study 1, controlling for age,  
 820 gender, and the other Openness/Intellect aspect  
 821

822 Table 3

823 *Descriptive statistics for all variables and correlations with Openness and Intellect (Study 2)*

	Descriptives			Correlations	
	M	SD	$\alpha$	Intellect	Openness
Intellect	3.71	.67	.73		
Openness	3.17	.84	.67	.14*	
Conformity (PVQ)	3.94	1.00	.73	-.02	-.19**
Tradition (PVQ)	3.31	.84	.43	-.05	-.06
Benevolence (PVQ)	4.76	.96	.79	.10	.21**
Universalism (PVQ)	4.50	.88	.74	.00	.30**
Self-Direction (PVQ)	4.67	.88	.68	.16*	.26**
Stimulation (PVQ)	4.06	1.11	.75	.07	.12*
Hedonism (PVQ)	4.44	1.06	.77	-.02	.02
Achievement (PVQ)	3.99	1.18	.84	.07	-.08
Power (PVQ)	3.01	1.05	.61	.04	-.19**
Security (PVQ)	4.00	.87	.61	-.05	-.08
Realistic (CIP-SF)	12.05	7.56	.86	.04	.03
Investigative (CIP-SF)	20.74	8.89	.88	.15*	.09
Artistic (CIP-SF)	22.24	9.98	.90	-.01	.42**
Social (CIP-SF)	27.65	7.23	.81	.06	.22**
Enterprising (CIP-SF)	16.86	8.60	.85	-.09	-.06
Conventional (CIP-SF)	10.97	7.78	.89	-.09	-.03
Economic Goals (MLGS)	3.35	.74	.80	-.07	-.26**
Aesthetic Goals (MLGS)	2.30	1.02	.85	-.05	.50**
Social Goals (MLGS)	4.15	.84	.85	.05	.30**
Relationship Goals (MLGS)	4.41	.70	.57	.12*	.04
Political Goals (MLGS)	2.99	1.01	.76	.03	.10
Hedonistic Goals (MLGS)	4.41	.66	.78	-.01	.06
Religious Goals (MLGS)	2.08	1.21	.83	-.11	.07

824 Notes: \* =  $p < .05$ ; \*\* =  $p < .01$ ; O = Openness/Intellect; PVQ = Portrait Values Questionnaire; CIP-  
825 SF = Computerised Interest Profiler – Short Form; MLGS = Major Life Goals Scale

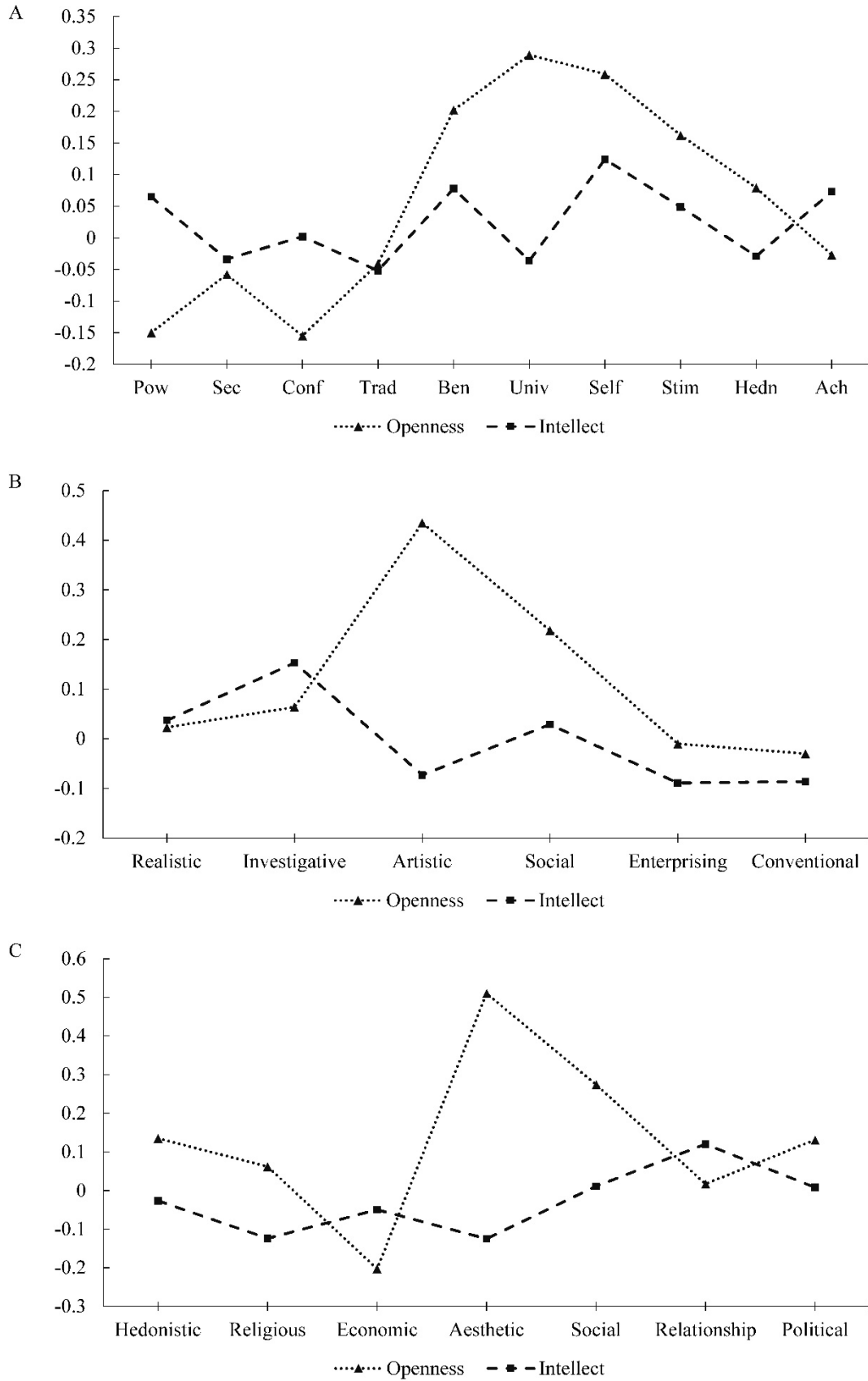
826

827 Table 4.  
 828 *Linear regressions with Values, Interests, and Major Life Goals as dependent variables and*  
 829 *Age, Gender, Openness and Intellect as predictors (Study 2)*

	F (df)	<i>p</i>	R <sup>2</sup> <sub>adj</sub>	R <sup>2</sup> <sub>adj</sub> 95% CI	Age	Gender	Openness	Intellect
<b>Values</b>								
Power	4.100 (4,261)	0.003	0.045	-.002 - .092	-0.088	<b>0.129</b>	<b>-0.150</b>	0.065
Security	.466 (4,261)	0.76	-0.008	-.006 - .008	-0.014	-0.045	-0.058	-0.034
Conformity	2.443 (4,261)	0.047	0.021	-.012 - .054	-0.076	-0.044	<b>-0.155</b>	0.002
Tradition	.769 (4,261)	0.546	-0.004	-.001 - .001	-0.038	-0.072	-0.041	-0.052
Benevolence	4.192 (4,261)	0.003	0.046	-.002 - .093	0.032	-0.057	<b>0.202</b>	0.078
Universalism	7.114 (4,261)	<.001	0.084	.022 - .146	0.060	-0.044	<b>0.289</b>	-0.036
Self-Direction	6.651 (4,261)	<.001	0.079	.019 - .139	0.013	0.033	<b>0.259</b>	<b>0.124</b>
Stimulation	3.128 (4,261)	0.015	0.031	-.009 - .071	<b>-0.146</b>	0.080	<b>0.162</b>	0.049
Hedonism	2.861 (4,261)	0.024	0.027	-.010 - .064	<b>-0.184</b>	0.095	0.079	-0.029
Achievement	2.740 (4,261)	0.029	0.026	-.011 - .063	<b>-0.142</b>	0.105	-0.027	0.073
<b>Interests</b>								
Realistic	1.878 (4,261)	0.115	0.013	-.013 - .039	0.053	0.154	0.023	0.037
Investigative	2.831 (4,261)	0.025	0.027	-.010 - .064	0.042	0.100	0.064	<b>0.153</b>
Artistic	14.711 (4,261)	<.001	0.171	.091 - .251	-0.078	-0.068	<b>0.435</b>	-0.073
Social	5.881 (4,261)	<.001	0.069	.012 - .126	-0.021	-0.168	<b>0.218</b>	0.029
Enterprising	1.665 (4,261)	0.159	0.010	-.013 - .033	<b>-0.128</b>	0.003	-0.010	-0.089
Conventional	.815 (4,261)	0.517	-0.003	-.002 - .002	0.036	0.047	-0.030	-0.086
<b>Major Life Goals</b>								
Hedonistic	6.651 (4,261)	<.001	0.079	.019 - .139	<b>-0.287</b>	0.109	<b>0.135</b>	-0.027
Religious	1.834 (4,261)	0.123	0.012	-.013 - .037	0.084	0.022	0.062	<b>-0.124</b>
Economic	8.466 (4,261)	<.001	0.101	.034 - .168	<b>-0.201</b>	0.071	<b>-0.203</b>	-0.050
Aesthetic	23.252 (4,261)	<.001	0.251	.163 - .339	0.016	0.082	<b>0.510</b>	<b>-0.125</b>
Social	10.191 (4,261)	<.001	0.122	.050 - .194	0.022	<b>-0.214</b>	<b>0.274</b>	0.011
Relationship	1.706 (4,261)	0.149	0.011	-.013 - .035	0.023	-0.095	0.017	0.120
Political	1.557 (4,261)	0.186	0.008	-.013 - .029	-0.113	0.023	<b>0.131</b>	0.008

830 Note: Standardised regression coefficients are reported, all regressions in bold were significant at  $p <$   
 831  $.01$ ; R<sup>2</sup><sub>adj</sub> = R squared adjusted; 95% CI = 95% Confidence Interval; Gender variable female was  
 832 coded 1, and male 2.





833  
 834 *Figure 2.* Plot of standardised multiple regression coefficients between Openness, Intellect,  
 835 and (A) Values, (B) Interests, and (C) Major Life Goals in Study 2, controlling for age,  
 836 gender, and the other Openness/Intellect aspect

837 Table 5  
 838 *Descriptive statistics for all variables and correlations with Openness and Intellect (Study 3)*

	Descriptives			Correlations	
	M	SD	$\alpha$	Intellect	Openness
Intellect	3.91	.62	.72		
Openness	3.44	.81	.67	.11	
Conformity (PVQ)	3.86	1.08	.77	-.05	-.18*
Tradition (PVQ)	3.14	.83	.47	-.08	-.15
Benevolence (PVQ)	4.54	.81	.68	.03	-.01
Universalism (PVQ)	4.44	.82	.78	.04	.22**
Self-Direction (PVQ)	4.77	.70	.55	.09	.12
Stimulation (PVQ)	3.70	1.03	.74	.12	.05
Hedonism (PVQ)	4.15	1.02	.79	.03	-.06
Achievement (PVQ)	3.98	1.05	.82	-.03	-.02
Power (PVQ)	3.05	.95	.66	.02	-.10
Security (PVQ)	4.11	.79	.62	.07	.00
Realistic (CIP-SF)	14.33	8.41	.89	-.08	-.07
Investigative (CIP-SF)	21.66	8.25	.87	.06	.02
Artistic (CIP-SF)	21.84	9.18	.89	.05	.46**
Social (CIP-SF)	23.69	7.64	.85	-.09	.13
Enterprising (CIP-SF)	16.39	7.83	.81	-.08	-.04
Conventional (CIP-SF)	13.50	8.31	.89	-.08	-.12
Economic Goals (MLGS)	3.04	.66	.75	-.01	.00
Aesthetic Goals (MLGS)	2.13	.89	.78	.01	.43**
Social Goals (MLGS)	3.75	.89	.85	-.03	.19*
Relationship Goals (MLGS)	4.34	.79	.58	.05	.06
Political Goals (MLGS)	2.67	1.04	.81	.05	-.02
Hedonistic Goals (MLGS)	4.16	.67	.73	-.05	.01
Religious Goals (MLGS)	2.08	1.16	.82	-.06	.05

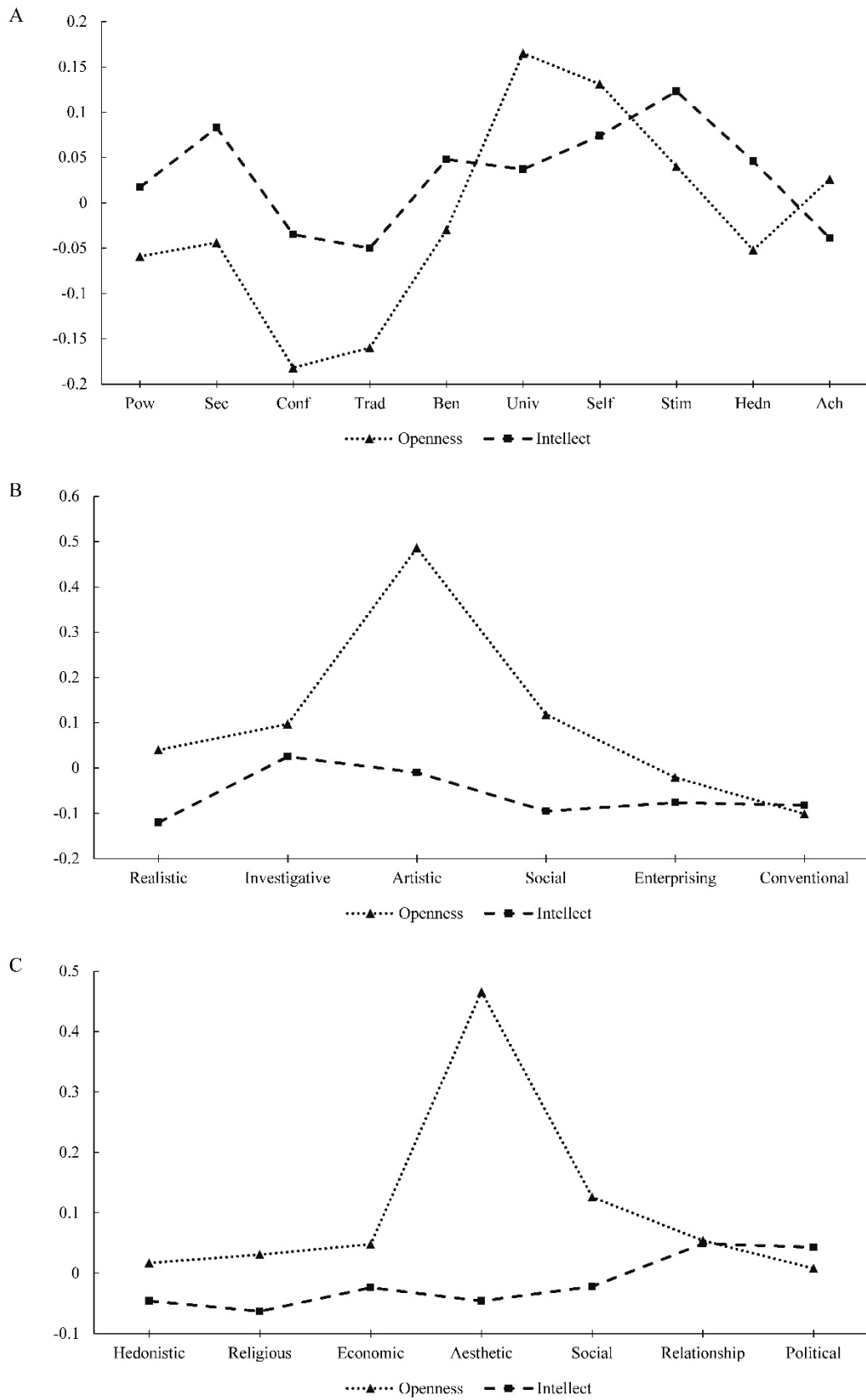
839 Notes: \* =  $p < .05$ ; \*\* =  $p < .01$ ; O = Openness/Intellect; PVQ = Portrait Values Questionnaire; CIP-  
 840 SF = Computerised Interest Profiler – Short Form; MLGS = Major Life Goals Scale

841

842 Table 6.  
 843 *Linear regressions with Values, Interests, and Major Life Goals as dependent variables and*  
 844 *Age, Gender, Openness and Intellect as predictors (Study 3)*

	F (df)	<i>p</i>	R <sup>2</sup> <sub>adj</sub>	R <sup>2</sup> <sub>adj</sub> 95% CI	Age	Gender	Openness	Intellect
<b>Values</b>								
Power	2.734 (4,168)	0.031	0.039	-.016 - .094	<b>-0.210</b>	<b>0.154</b>	-0.059	0.017
Security	1.134 (4,168)	0.342	0.003	-.013 - .019	0.077	-0.151	-0.044	0.083
Conformity	1.551 (4,168)	0.190	0.013	-.020 - .046	0.034	-0.011	<b>-0.182</b>	-0.035
Tradition	1.428 (4,168)	0.227	0.010	-.019 - .037	-0.050	-0.060	<b>-0.160</b>	-0.050
Benevolence	4.300 (4,168)	0.002	0.071	-.001 - .143	<b>-0.285</b>	-0.056	-0.030	0.048
Universalism	4.136 (4,168)	0.003	0.068	-.002 - .138	-0.028	<b>-0.201</b>	<b>0.165</b>	0.037
Self-Direction	1.244 (4,168)	0.294	0.006	-.016 - .028	-0.080	0.060	0.131	0.074
Stimulation	3.939 (4,168)	0.004	0.064	-.004 - .132	<b>-0.267</b>	0.014	0.040	0.123
Hedonism	6.985 (4,168)	<.001	0.122	.033 - .211	<b>-0.378</b>	0.035	-0.052	0.046
Achievement	5.178 (4,168)	0.001	0.089	.010 - .168	-0.334	<b>0.149</b>	0.026	-0.039
<b>Interests</b>								
Realistic	12.081 (4,168)	<.001	0.210	.105 - .315	<b>0.190</b>	<b>0.390</b>	0.040	-0.120
Investigative	5.087 (4,168)	0.001	0.087	.009 - .165	0.076	<b>0.308</b>	0.097	0.025
Artistic	11.775 (4,168)	<.001	0.200	.100 - .303	-0.038	0.108	<b>0.486</b>	-0.010
Social	2.688 (4,168)	0.033	0.038	-.016 - .092	-0.127	-0.100	0.118	-0.095
Enterprising	.380 (4,168)	0.823	-0.015	-.002 - .003	-0.022	0.048	-0.021	-0.076
Conventional	3.826 (4,168)	0.005	0.062	-.006 - .130	<b>0.230</b>	0.061	-0.101	-0.082
<b>Major Life Goals</b>								
Hedonistic	5.186 (4,168)	0.001	0.089	.010 - .168	<b>-0.328</b>	0.004	0.017	-0.046
Religious	.576 (4,168)	0.681	-0.010	-.003 - .003	0.046	-0.082	0.031	-0.063
Economic	3.815 (4,168)	0.005	0.061	-.006 - .128	<b>-0.280</b>	<b>0.168</b>	0.048	-0.024
Aesthetic	10.387 (4,168)	<.001	0.179	.079 - .279	-0.040	0.123	<b>0.466</b>	-0.046
Social	5.482 (4,168)	<.001	0.094	.014 - .174	-0.095	<b>-0.250</b>	0.126	-0.022
Relationship	.598 (4,168)	0.665	-0.009	-.003 - .003	-0.086	-0.014	0.054	0.049
Political	4.183 (4,168)	0.003	0.069	-.002 - .140	<b>-0.302</b>	0.122	0.008	0.043

845 Note: Standardised regression coefficients are reported, all regressions in bold were significant at *p* <  
 846 .01; R<sup>2</sup><sub>adj</sub> = R squared adjusted; 95% CI = 95% Confidence Interval; Gender variable female was  
 847 coded 1, and male 2.



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849 *Figure 3.* Plot of standardised multiple regression coefficients between Openness, Intellect,  
 850 and (A) Values, (B) Interests, and (C) Major Life Goals in Study 3, controlling for age,  
 851 gender, and the other Openness/Intellect aspect

852 Table 7.  
 853 *Summary of relationships for Openness and Intellect across Studies 1, 2, and 3*

	Intellect			Openness		
	Study 1	Study 2	Study 3	Study 1	Study 2	Study 3
<b>Values</b>						
Power						
Security						
Conformity						
Tradition						
Benevolence						
Universalism				(+)		
Self-Direction						
Stimulation						
Hedonism						
Achievement						
<b>Interests</b>						
Realistic						
Investigative						
Artistic				(+)	(+)	(+)
Social						
Enterprising						
Conventional						
<b>Major Life Goals</b>						
Hedonistic						
Religious						
Economic						
Aesthetic				(+)	(+)	(+)
Social						
Relationship						
Political						

854 Note: (+) indicates the standardised regression coefficient was positive

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