



Does Openness to Experience predict changes in conservatism? A nine-wave longitudinal investigation into the personality roots to ideology

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ABSTRACT

Although Openness to Experience correlates negatively with conservatism, recent studies question the assumption that personality *precedes* political attitudes. We contribute to this debate by using nine annual waves of a nation-wide longitudinal panel study ($N = 17,207$) to investigate the temporal ordering of Openness to Experience and conservatism. Although cross-lagged panel models suggest that Openness to Experience predicts decreases in conservatism, analyses that properly separate between-person stability from within-person change find no evidence to suggest that personality *precedes* ideology (or vice-versa). These findings raise concerns about a critical assumption in the literature and suggest that personality and political ideology develop in parallel with one another, rather than personality causally preceding conservatism.

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1. Introduction

Theorists have long posited that individual-differences underlie political beliefs (e.g., Adorno, Frenkel-Brunswick, Levinson, & Sanford, 1950). Contemporary work identifies Openness to Experience—the tendency to appreciate and seek novelty—as the strongest personality correlate of political attitudes (Furnham & Fenton-O'Creevy, 2018; Krieger, Becker, Greiff, & Spinath, 2019; Sibley, Osborne, & Duckitt, 2012). Specifically, because opposition to change is a central feature of conservatism (Jost, Glaser, Kruglanski, & Sulloway, 2003), Openness to Experience correlates negatively with conservative issue positions (Osborne & Sibley, 2015), voting behaviour (Chirumbolo & Leone, 2010; Osborne & Sibley, 2012; Rentfrow, Jost, Gosling, & Potter, 2009), and ideologies (Jost et al., 2003; Sibley et al., 2012). Although “hundreds, if not thousands, of papers on personality and political traits have been published claiming causality” (Hatemi & Verhulst, 2015, p. 2), recent work questions the prevailing assumption that personality *precedes* conservatism (Verhulst, Eaves, et al., 2012). Longitudinal tests to help inform this debate, however, are scarce.

Here, we utilize nine annual waves of panel data from a national probability study to investigate the temporal ordering of personality and ideology. Because traits emerge as early as preschool (Block

& Block, 2006)—long-before socio-political beliefs crystallise (Sears & Valentino, 1997), we pre-registered our hypothesis that Openness to Experience would predict annual decreases in conservatism (<https://osf.io/3xw7t/>). However, an alternative perspective argues that, rather than *preceding* political beliefs, a third variable (namely, a common genetic component) explains the relationship between personality and conservatism (Verhulst, Eaves, et al., 2012). Accordingly, we also test the alternative possibilities (a) that ideology precedes personality (b) and that the temporal association between personality and conservatism disappears after accounting for methodological artefacts.

Whereas traditional cross-lagged panel models (CLPMs) are often used to examine the temporal ordering of individual-differences and socio-political beliefs (e.g., Osborne, Milojev, et al., 2017), concerns have been raised that this approach confounds within-person change with between-person stability (Hamaker, Kuiper, & Grasman, 2015). For example, Berry and Willoughby (2017) note that, “despite their intuitive appeal and ubiquity..., [traditional CLPMs] typically give rise to estimates that are difficult (or impossible) to interpret meaningfully” (p. 1187). Accordingly, we present analyses comparing traditional CLPMs with random-intercepts CLPMs (RI-CLPMs)—an analytic approach that properly separates between-person stability from within-person change (Hamaker et al., 2015). Thus, we provide the first test of the temporal ordering of personality and ideology that focuses explicitly on the within-person relationships between Openness to Experience and conservatism. As per our preregistration, we replicate these analyses across three separate measures of conservatism (namely, conservatism, conservative party support, and left- versus right-wing self-placement) to examine the generalizability of our results.

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2. Method

2.1. Sampling procedure

We analysed data from Times 1–9 of the New Zealand Attitudes and Values Study (NZAVS)—a longitudinal national probability study of adults that began in 2009. Sampling for the NZAVS occurred on five occasions. In 2009 (Time 1), a random sample of adults from the electoral roll¹ were invited to participate in a projected 20-year longitudinal panel study. This first sampling occasion yielded 6,518 participants (response rate = 16.6%). By 2011, 3,914 participants remained in the study (60% retention from Time 1). To address sample attrition, a non-random booster sample was recruited from the website of a nation-wide newspaper. This second sampling occasion yielded 2,970 new participants and increased the sample size at Time 3 to 6,884 participants.

To further increase the size and diversity of the sample, we conducted three additional booster samples by randomly sampling (without replacement) the electoral roll, oversampling hard-to-reach populations. The first of these three sampling occasions was in 2012 (Time 4) and used multiple sample frames to recruit 5,108 new participants into the study (response rate = 10.0%). The second sampling occasion occurred in 2013 (Time 5) and recruited 7,581 new participants into the study (response rate = 10.6%), whereas the third sampling occasion occurred in 2016 (Time 8) and recruited 7,669 new participants into the study (response rate = 9.5%). Thus, Time 8 included 21,936 participants (13,778 retained from a prior time point, 7,669 additions from booster sampling, and 489 unmatched or unsolicited opt-ins). By 2017 (Time 9), 17,072 participants remained in the study (retention rate from Time 8 = 77.8%). In total, 31,604 participants completed at least one wave of the study.

2.2. Participants

We focus on the 17,207 participants ($M_{\text{age at Time 1}} = 44.77$, $SD = 14.28$; 63.0% women) who provided partial or complete responses to our focal variables and who completed at least three waves of the study ($M_{\text{waves completed}} = 5.50$, $SD = 1.78$; Range: 3–9).² On average, participants were in the study for 4.97 years ($SD = 1.75$), while 1,830 participants completed all nine annual waves and, thus, were in the study for the full eight years (i.e., 2009 to 2017).³ In terms of ethnicity, 77.5% identified as New Zealand European, 15.3% identified as Māori, 2.9% identified as Pacific Islander, and 4.3% identified as Asian. The median educational attainment of the sample was a Level 6 Diploma/Certificate (equivalent to a trade school or associate's degree in the United States). Although our random sample over-represents women, New Zealand Europeans, and those with advanced degrees relative to the New Zealand census (see Table S1), comparisons with nationally representative public opinion polls reveal that the NZAVS nevertheless accurately assesses mean levels of support for the main political parties in New Zealand and is sensitive to changes in voter sentiment over time (see Sibley et al., 2017).

¹ Registration on the electoral role is compulsory, save for rare case-by-case exceptions.

² Although our pre-registered analyses included anyone who provided partial or complete responses to one or more waves of the study ($Ns = 30,143$ – $31,534$), we adopted stricter inclusion criteria here to address reviewers' concerns about the number of waves completed by participants. The Online Supplementary File reveals that our results replicate across these different inclusion criteria when adopting the inclusion criteria specified in our pre-registration report.

³ In terms of rates of participation across waves of the study, 2,450 participants completed three waves, 2,696 completed four waves, 4,749 completed five waves, 2,846 completed six waves, 1,918 completed seven waves, 718 completed eight waves, and 1,830 completed all nine waves of the study.

2.3. Measures

Openness to Experience and conservatism measures were embedded within an omnibus survey. Unless noted, items were included in all nine annual waves of the study.

Openness to Experience was assessed using a four-item scale from the Mini-IPIP6 (Sibley et al., 2011) whereby participants rated “how accurately each statement describes you”: (a) “Have a vivid imagination”, (b) “Have difficulty understanding abstract ideas” (reverse-coded), (c) “Do not have a good imagination” (reverse-coded), and (d) “Am not interested in abstract ideas” (reverse-scored; $\alpha s = 0.66$ – 0.72). Items were rated on a 7-point Likert scale with anchors at 1 (Very inaccurate) and 7 (Very accurate).

Conservatism was assessed using a single-item measure that had participants “rate how politically liberal versus conservative” they saw themselves on a 7-point Likert scale with anchors at 1 (Extremely liberal) and 7 (Extremely conservative).⁴

National Party support was assessed using a single-item measure that had participants indicate how strongly they “oppose or support” a range of parties including New Zealand's main centre-right conservative political party (i.e., The National Party) on a 7-point Likert scale with anchors at 1 (Strongly oppose), 4 (Neutral), and 7 (Strongly support).

Left- versus right-wing self-placement was assessed using a single-item measure that had participants “rate how politically left-wing versus right-wing” they saw themselves on a 7-point Likert scale with anchors at 1 (Extremely left-wing) and 7 (Extremely right-wing). This item was introduced in 2011 (i.e., Time 3) and included in every wave thereafter.

3. Results

3.1. Attrition analyses

Prior to testing our hypotheses, we conducted a logistic regression using the Time 1 measures of age, gender, ethnicity, education, Openness to Experience, and conservatism to predict whether or not participants withdrew from the study. These analyses revealed that age correlated positively ($b = 0.044$, $SE = 0.003$, $p < .001$; odds ratio = 1.045; 95% CI = 1.039, 1.052), whereas education ($b = -0.050$, $SE = 0.016$, $p = .002$; odds ratio = 0.951; 95% CI = 0.922, 0.982) and Openness to Experience ($b = -0.093$, $SE = 0.040$, $p = .02$; odds ratio = 0.911; 95% CI = 0.843, 0.985) correlated negatively, with the likelihood of withdrawing from the study. Asians were also nearly twice as likely as New Zealand Europeans to withdraw from the study ($b = 0.658$, $SE = 0.209$, $p = .002$; odds ratio = 1.931; 95% CI = 1.283, 2.907). However, conservatism was not reliably associated with withdrawing from the study ($b = 0.044$, $SE = 0.035$, $p = .21$; odds ratio = 1.045; 95% CI = 0.976, 1.120; for additional information about the predictors of sample attrition, see Satherley et al., 2015).

3.2. Analytic strategy

Table 1 displays the descriptive statistics and bivariate correlations for Openness to Experience and conservatism. As shown here, Openness to Experience ($r = 0.64$, $p < .001$) and conservatism ($r = 0.54$, $p < .001$) displayed high levels of rank-order stability over nine years (i.e., between the annual assessments at Time 1 and Time 9). Fisher z-score transformations and subsequent transformations back to Pearson correlation coefficients further revealed that the average wave-to-

⁴ At Time 1, the anchors for this scale were switched (i.e., 1 = Extremely conservative; 7 = Extremely liberal) and, hence, reverse-coded.

Table 1
Descriptive statistics and bivariate correlations for Openness to Experience and conservatism.

	<i>M</i>	<i>SD</i>	<i>N</i>	α	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Openness _{T1}	4.77	1.12	4,826	0.67	---																
2. Openness _{T2}	4.73	1.09	4,076	0.66	0.66	---															
3. Openness _{T3}	4.92	1.11	6,286	0.70	0.65	0.68	---														
4. Openness _{T4}	4.90	1.09	10,319	0.69	0.64	0.66	0.70	---													
5. Openness _{T5}	4.91	1.10	15,364	0.69	0.64	0.66	0.70	0.70	---												
6. Openness _{T6}	4.91	1.09	14,865	0.70	0.64	0.67	0.71	0.71	0.74	---											
7. Openness _{T7}	4.90	1.10	13,614	0.71	0.65	0.68	0.69	0.69	0.72	0.74	---										
8. Openness _{T8}	4.90	1.10	13,442	0.71	0.65	0.65	0.69	0.70	0.71	0.74	0.75	---									
9. Openness _{T9}	4.91	1.11	11,179	0.72	0.64	0.66	0.69	0.70	0.72	0.74	0.75	0.77	---								
10. Conser- vatism _{T1}	3.75	1.23	4,570	---	-0.22	-0.23	-0.20	-0.19	-0.20	-0.21	-0.22	-0.20	-0.23	---							
11. Conser- vatism _{T2}	3.96	1.30	3,835	---	-0.23	-0.26	-0.23	-0.22	-0.24	-0.24	-0.26	-0.24	-0.24	0.53	---						
12. Conser- vatism _{T3}	3.74	1.38	5,985	---	-0.23	-0.25	-0.31	-0.29	-0.27	-0.31	-0.30	-0.31	-0.31	0.52	0.63	---					
13. Conser- vatism _{T4}	3.64	1.27	9,675	---	-0.22	-0.23	-0.29	-0.27	-0.27	-0.28	-0.27	-0.28	-0.28	0.53	0.60	0.68	---				
14. Conser- vatism _{T5}	3.62	1.29	14,379	---	-0.22	-0.23	-0.27	-0.27	-0.26	-0.26	-0.25	-0.26	-0.27	0.52	0.58	0.67	0.69	---			
15. Conser- vatism _{T6}	3.58	1.31	13,794	---	-0.22	-0.23	-0.30	-0.26	-0.25	-0.28	-0.26	-0.25	-0.27	0.51	0.58	0.66	0.69	0.70	---		
16. Conser- vatism _{T7}	3.61	1.31	12,748	---	-0.25	-0.25	-0.30	-0.29	-0.27	-0.27	-0.28	-0.27	-0.28	0.54	0.59	0.65	0.69	0.70	0.71	---	
17. Conser- vatism _{T8}	3.64	1.36	12,845	---	-0.23	-0.22	-0.30	-0.28	-0.25	-0.26	-0.26	-0.27	-0.27	0.54	0.60	0.66	0.68	0.68	0.71	0.71	---
18. Conser- vatism _{T9}	3.60	1.38	10,661	---	-0.23	-0.25	-0.30	-0.27	-0.27	-0.29	-0.28	-0.28	-0.28	0.54	0.59	0.66	0.67	0.67	0.70	0.71	0.73

Note: All correlations are significant at $p < .001$.

wave correlations for Openness to Experience ($\bar{r} = 0.72, p < .001$) and conservatism ($\bar{r} = 0.68, p < .001$) were also high. These results demonstrate that people's *relative* positions on both Openness to Experience and conservatism were stable over time.

To assess whether personality predicted *changes* in conservatism over time (and vice-versa), we conducted two separate sets of analyses. In the first set of analyses, we estimated a traditional CLPM in which the mean-scaled score for Openness to Experience and the single-item conservatism measure at $T - 1$ were used to predict both measures the following year across all nine annual waves of the study. To model these associations as a stationary process, all congeneric paths were constrained to equality (e.g., the autoregressive association between Openness to Experience at Time 1 and Time 2 was constrained to be equal to the same autoregressive association at Time 2 and Time 3 and so on).

Although traditional CLPMs provide a familiar framework for modelling change over time, this approach confounds within-person change with between-person stability and can therefore yield inaccurate conclusions about the temporal ordering of variables (see Berry & Willoughby, 2017; Hamaker et al., 2015). Fortunately, various methods have been developed to address this issue including multi-level modelling (Hamaker et al., 2015), latent growth curve modelling (Grimm, Ram, & Estabrook, 2017), and latent trajectory modelling (Berry & Willoughby, 2017). However, an RI-CLPM uniquely balances the strengths and weaknesses of these diverse approaches by using a random intercept to account for stable trait-like differences in constructs, while simultaneously modelling within-person change using an intuitive framework (see Hamaker et al., 2015). Accordingly, we estimated an RI-CLPM in a second set of analyses (for a conceptual overview, see Fig. 1). To these ends, we first estimated a random intercept for both Openness to Experience and conservatism by fixing the factor loadings of each variable at each measurement occasion to 1, and by allowing the two random intercepts to correlate. Thus, these random intercepts reflect the sample means of each participant's average levels of Openness to Experience and conservatism across all nine annual assessments.

To model within-person deviations from these averages, we simultaneously estimated a latent variable for each construct at each measurement occasion by constraining the factor loading and the residual variance for each manifest indicator at each assessment occasion to 1 and 0, respectively. We then used the within-person components of our model to estimate a stationary cross-lagged model in which the within-person latent variables at Time 9 were regressed onto the within-person latent variables at Time 8 (and so on). To account for time-specific sources of systematic variance (e.g., participants' mood while completing the survey in a given year), we estimated the covariances between the within-person latent variables at Time 1, as well as the contemporaneous residual variances at Times 2 to 9; however, the correlations between both random intercepts and the within-person measures of Openness to Experience and conservatism at Time 1 were constrained to 0. Finally, we estimated bias-corrected (BC) 95% Confidence Intervals (CIs) using 1,000 bootstrapped resamples (with replacement).⁵ We followed the same procedure when estimating the separate models for (a) National Party support and (b) left- versus right-wing self-placement.

Given the inevitability of missing data in longitudinal research, we estimated our models using Full Information Maximum Likelihood (FIML). Notably, FIML is an efficient way to utilise all available data without discarding responses as would be the case if using listwise or casewise deletion (Enders & Bandalos, 2001). Moreover, FIML neither imputes missing values, nor requires data to be missing com-

pletely at random (Enders, 2001). Finally, FIML outperforms both listwise and casewise deletion in terms of producing unbiased and efficient parameter estimates, while managing Type 1 errors (Enders & Bandalos, 2001). Thus, we utilized FIML to estimate the CLPMs and RI-CLPMs presented below.

3.3. Main analyses

Model 1 in the leftmost columns of Table 2 displays the results of our traditional CLPM including Openness to Experience and conservatism, $\chi^2_{(140)} = 26104.161, p < .001$; comparative fit index (CFI) = 0.802; root mean square error of approximation (RMSEA) = 0.104 [0.103, 0.105], standardized root mean square residual (SRMR) = 0.198. Although model fit was poor (i.e., CFI < 0.90, RMSEA > 0.06, SRMR > 0.08), the autoregressive paths reveal that both Openness to Experience ($B = 0.714$, BC 95% CI = [0.707, 0.720]; $p < .001$) and conservatism ($B = 0.684$, BC 95% CI = [0.676, 0.692]; $p < .001$) were stable over time. Most relevant for our purposes, however, are the cross-lagged associations between personality and ideology. Specifically, conservatism_{T-1} predicted decreases in Openness to Experience ($B = -0.059$, BC 95% CI = [-0.063, -0.055]; $p < .001$), and Openness to Experience_{T-1} predicted decreases in conservatism ($B = -0.096$, BC 95% CI = [-0.103, -0.089]; $p < .001$), over time. Nevertheless, the latter association was significantly larger than the former association ($B_{\text{Difference}} = -0.037$, BC 95% CI = [-0.043, -0.031]; $p < .001$), suggesting that, although the relationship between traits and ideology appears to be bidirectional, Openness to Experience decreases conservatism more than conservatism decreases Openness to Experience.

After properly partitioning the between-person stability from within-person change, inspection of the RI-CLPM displayed in Fig. 2 (and the rightmost columns of Table 2) tells a different—albeit more complete—story, $\chi^2_{(137)} = 914.340, p < .001$; CFI = 0.994; RMSEA = 0.018 [0.017, 0.019], SRMR = 0.048. Specifically, the between-person components of Openness to Experience and conservatism correlated negatively ($B = -0.373$, BC 95% CI = [-0.390, -0.355]; $p < .001$), indicating that conservatives were, on average, less imaginative and interested in novelty than liberals. Moreover, within-person deviations from these trait-level means (i.e., the auto-regressive associations) correlated positively over time for both Openness to Experience ($B = 0.080$, BC 95% CI = [0.069, 0.093]; $p < .001$) and conservatism ($B = 0.080$, BC 95% CI = [0.066, 0.094]; $p < .001$). Whereas auto-regressive effects in a traditional CLPM capture rank-order *stability* across assessments, these coefficients in an RI-CLPM reflect the *persistence* of a one-point deviation from a person's trait-level mean at one assessment to the ensuing assessment. In other words, auto-regressive effects in RI-CLPMs indicate the degree to which a variable *continues* to increase (decrease) within people over time, after adjusting for the rank-order stability of the construct (i.e., the random intercept).⁶ Accordingly, a one-point deviation above (below) participants' mean level of Openness to Experience persisted as a 0.080-point positive (negative) deviation from their trait-level mean the following year.

Most relevant for the current study are the associations that model the within-person dynamics between personality and ideology. To these ends, the within-person cross-lagged effect of both Openness to Experience_{T-1} on conservatism ($B = -0.003$, BC 95% CI = [-0.016, 0.009]; $p = .644$) and conservatism_{T-1} on Openness to Experience ($B = -0.004$, BC 95% CI = [-0.012, 0.005]; $p = .360$) were *not* significant. Thus, contrary to the prevailing assumption that personal-

⁵ The Online Supplementary File includes our Mplus syntax.

⁶ Note that a positive correlation could reflect either an increase or a decrease in a construct over time (i.e., a deviation below the trait-level mean could persist as a further decrease in the construct the following year).

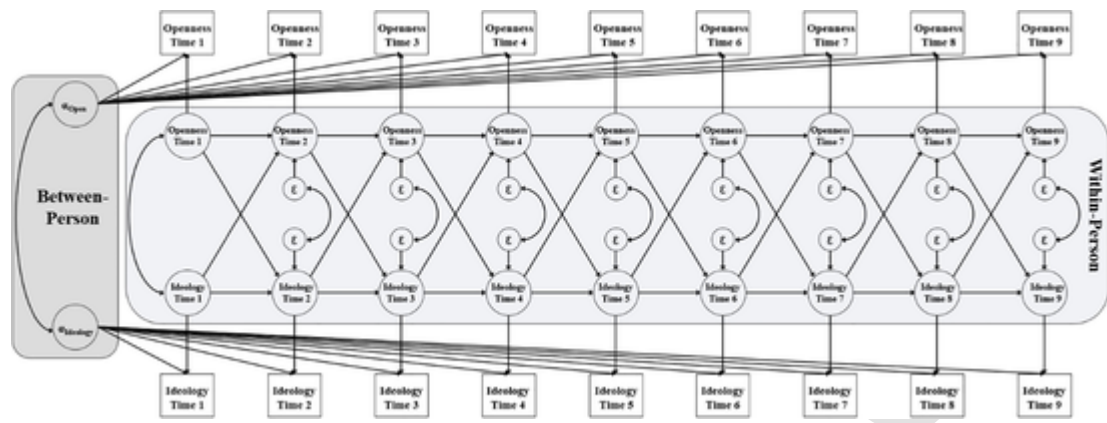


Fig. 1. Conceptual random intercepts cross-lagged panel model of the associations between Openness to Experience and conservatism (Ideology).

Table 2

Path coefficients of the associations between Openness to Experience and three measures of conservatism.

			Traditional Cross-lagged Panel Model		Random Intercepts Cross-lagged Panel Model		
Model	Outcome	Predictor _{T-1}	B	95% CI	B	95% CI	
Model 1 (N = 17,207)							
	Openness	Openness	0.714 ***	(0.707, 0.720)	0.080 ***	(0.069, 0.093)	
		Conservatism	-0.059 ***	(-0.063, -0.055)	-0.004	(-0.012, 0.005)	
	Conservatism	Conservatism	0.684 ***	(0.676, 0.692)	0.080 ***	(0.066, 0.094)	
		Openness	-0.096 ***	(-0.103, -0.089)	-0.003	(-0.016, 0.009)	
	Slope contrast ¹			-0.037 ***	(-0.043, -0.031)	0.001	(-0.012, 0.015)
	Model 2 (N = 17,207)						
	Openness	Openness	0.728 ***	(0.722, 0.734)	0.080 ***	(0.069, 0.094)	
		National	-0.022 ***	(-0.025, -0.019)	0.002	(-0.005, 0.009)	
	National	National	0.864 ***	(0.861, 0.868)	0.258 ***	(0.241, 0.278)	
		Openness	-0.043 ***	(-0.050, -0.037)	0.006	(-0.008, 0.019)	
	Slope contrast ¹			-0.021 ***	(-0.026, -0.016)	0.004	(-0.010, 0.017)
	Model 3 (N = 17,206)						
	Openness	Openness	0.731 ***	(0.725, 0.738)	0.070 ***	(0.057, 0.084)	
		Left vs. right	-0.043 ***	(-0.047, -0.039)	-0.004	(-0.015, 0.007)	
	Left vs. right	Left vs. right	0.775 ***	(0.768, 0.782)	0.127 ***	(0.107, 0.146)	
		Openness	-0.060 ***	(-0.065, -0.054)	-0.010	(-0.023, 0.003)	
	Slope contrast ¹			-0.016 ***	(-0.022, -0.011)	-0.007	(-0.019, 0.007)

¹ Slope contrast refers to difference between cross-lagged effects in the given model. * $p < .05$; ** $p < .01$; *** $p < .001$.

ity fosters ideology (e.g., see Osborne & Sibley, 2015), we find no evidence that Openness to Experience precedes changes in conservatism. Rather, after appropriately partitioning the variance of these cross-lagged associations into their between-person and within-person components, the previously identified longitudinal associations between personality and ideology are mostly attributable to the stability in the between-person differences in Openness to Experience and conservatism.

3.4. Replicability

To investigate the replicability of our findings, we re-ran both the traditional CLPM and the RI-CLPM using (a) support for the National Party (Model 2) and (b) left- versus right-wing self-placement (Model 3) as separate measures of political conservatism. As shown in Table 2

, the traditional CLPM revealed that Openness to Experience_{T-1} predicted decreases in both (a) National Party support ($B = -0.043$, BC 95% CI = $[-0.050, -0.037]$; $p < .001$) and (b) left- versus right-wing self-placement ($B = -0.060$, BC 95% CI = $[-0.065, -0.054]$; $p < .001$). Although the respective reciprocal associations were also significant (i.e., $B = -0.022$, BC 95% CI = $[-0.025, -0.019]$; $p < .001$ and $B = -0.043$, BC 95% CI = $[-0.050, -0.037]$; $p < .001$, respectively), comparisons between the slopes demonstrated that Openness to Experience was a stronger predictor of decreases in both (a) National Party support ($B_{\text{Difference}} = -0.021$, BC 95% CI = $[-0.026, -0.016]$; $p < .001$) and (b) left- versus right-wing self-placement ($B_{\text{Difference}} = -0.016$, BC 95% CI = $[-0.022, -0.011]$; $p < .001$) than vice-versa. Thus, results replicated the initial findings from our traditional CLPM and suggest that personality temporally precedes conservatism—at least when ignoring the confounding of between-person stability and within-person change.

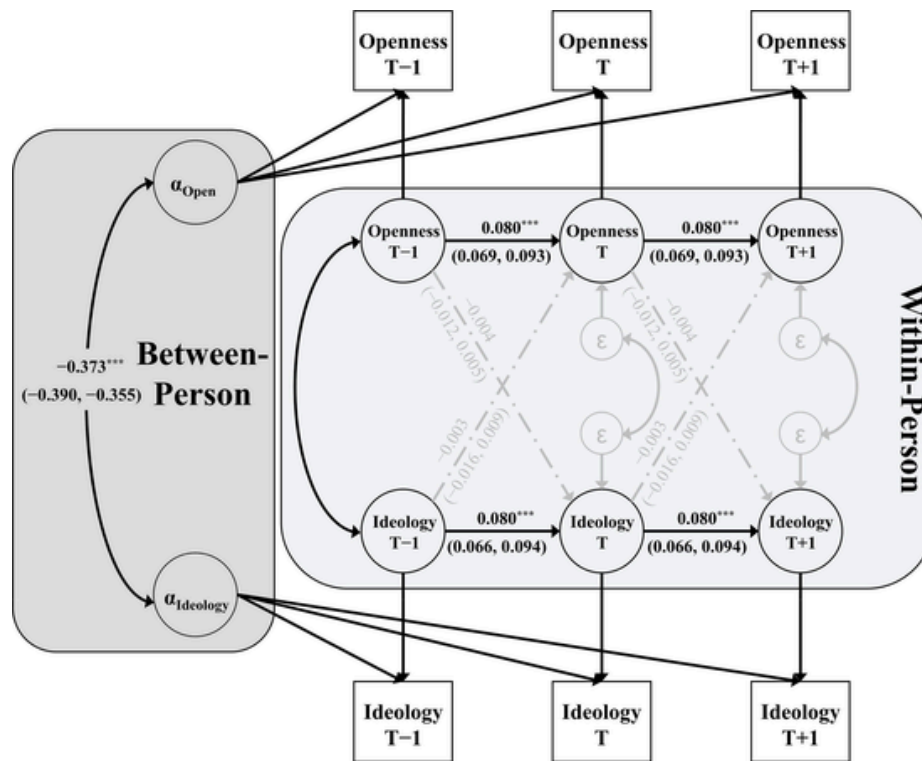


Fig. 2. Random intercepts cross-lagged panel model of the associations between Openness to Experience and political conservatism (Ideology). Coefficients are unstandardized (with bias corrected 95% confidence intervals). Grey dotted lines reflect non-significant paths. $^+p < .10$ $^*p < .05$; $^{**}p < .01$; $^{***}p < .001$.

Analyses based on an RI-CLPM, however, once again reveal a different picture. Specifically, after separating the between-person stability from the within-person change, the between-person component of Openness to Experience correlated negatively with both (a) National Party support ($B = -0.302$, BC 95% CI = $[-0.331, -0.275]$; $p < .001$) and (b) left- versus right-wing self-placement ($B = -0.277$, BC 95% CI = $[-0.295, -0.257]$; $p < .001$). In terms of the within-person components of the model, the autoregressive effects displayed in Table 2 demonstrate that within-person deviations from a person's mean level of National Party support ($B = 0.258$, BC 95% CI = $[0.241, 0.278]$; $p < .001$) and left- versus right-wing self-placement ($B = 0.127$, BC 95% CI = $[0.107, 0.146]$; $p < .001$) persisted a year later. But most notably, the focal cross-lagged effects of Openness to Experience on the respective measures of conservatism were unreliable ($B = 0.006$, BC 95% CI = $[-0.008, 0.019]$; $p = .428$ and $B = -0.010$, BC 95% CI = $[-0.023, 0.003]$; $p = .108$, respectively). Likewise, neither National Party support ($B = 0.002$, BC 95% CI = $[-0.005, 0.009]$; $p = .640$), nor left- versus right-wing self-placement ($B = -0.004$, BC 95% CI = $[-0.015, 0.007]$; $p = .488$), predicted changes in Openness to Experience over time. Thus, although between-person levels of Openness to Experience and measures of conservatism correlate negatively, we find no evidence that personality precedes within-person changes in ideology over time.

4. Discussion

The literature on individual differences and political beliefs assumes that personality *causes* conservatism. Our results do not support this prevailing assumption (nor our preregistered hypotheses). Whereas others argue that genes (Verhulst, Eaves, et al., 2012), environmental factors (Verhulst, Hatemi, et al., 2012), or both (Hatemi et al., 2009) explain the correlation between personality and ideology, our findings suggest that the temporal precedence of personality may also be a methodological artefact. Indeed, adjusting for between-person stability eliminates the cross-lagged effect of Openness to Experience

on multiple measures of conservatism. These results highlight limitations to traditional CLPMs (see Hamaker et al., 2015) and show that analyses that fail to partition between-person stability from within-person change can yield inaccurate conclusions (see also Berry & Willoughby, 2017).

We caution against viewing our results as evidence of the replication crisis, as the cross-sectional relationship between personality and key outcomes—including political ideology—is highly replicable (see Soto, 2019). Indeed, our traditional CLPMs revealed that Openness to Experience precedes declines in conservatism. Yet we fail to find evidence that Openness to Experience predicts *within-person* changes in conservatism after adjusting for between-person stability in both variables. Thus, our results point to a previously overlooked methodological artefact and suggest that theorists revisit the assumed temporal precedence of personality on consequential outcomes.

One limitation to our study is that we assess personality and political beliefs amongst adults (i.e., after personality and political attitudes develop; see Sears & Valentino, 1997). Accordingly, Openness to Experience may nevertheless precede conservatism among youths, or it may take longer than eight years for personality to influence political beliefs. Also, although our measure of Openness to Experience has been widely used and validated in the literature (Sibley et al., 2011), traits are nuanced constructs comprised of lower-order facets and aspects (DeYoung, 2015; DeYoung, Quilty, & Peterson, 2007), only some of which correlate with conservatism (e.g., see DeYoung, 2014; Hirsh, DeYoung, Xu, & Peterson, 2010; Osborne, Dufresne, et al., 2017). Likewise, our unidimensional measures of ideology overlook distinctions between cultural and economic conservatism (see Malka, Lelkes, & Soto, 2019). Thus, future research that incorporates a pre-adulthood sample, aspect-level indicators of personality, and multidimensional measures of conservatism is needed to examine the boundary conditions to our results.

Finally, we'd like to highlight some of the strengths and limitations of our analytic approach. On the one hand, our use of an RI-CLPM al-

allows us to effectively separate between-person stability from within-person change and, thus, investigate a core assumption within the literature on personality and political beliefs (namely, that Openness to Experience *precedes* changes in conservatism). On the other hand, the complexity of our model makes it difficult to examine potential variability in the cross-lagged paths across different segments of the population. Yet an emerging literature demonstrates that political engagement helps people to identify the political beliefs that resonate with their personality (e.g., see Federico & Goren, 2009; Leone, Chirumbolo, & Desimoni, 2012; Malka, Lelkes, Srivastava, Cohen, & Miller, 2012; Osborne & Sibley, 2012, 2015). Likewise, given that Openness to Experience declines with age (Milojev & Sibley, 2017), the relationship between Openness to Experience and conservatism may vary across the lifespan. Thus, although we find no evidence that personality precedes within-person changes in ideology in general, moderators to these (non-significant) cross-lagged associations may nevertheless exist.

5. Conclusion

Although conservatives have, on average, stronger epistemic needs than do liberals (Jost et al., 2003), tests of the temporal ordering of personality and ideology are rare. We use data from a national probability study to address this oversight and show that, after accounting for between-person stability, neither Openness to Experience, nor conservatism, predict within-person changes in each other over time. Together with recent work demonstrating a genetic basis to the association between personality and political beliefs (Verhulst, Eaves, et al., 2012), our results call into question the personality roots to ideology and suggest that Openness to Experience may develop in parallel with conservatism (rather than causally preceding political attitudes).

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The data described in the paper are part of the New Zealand Attitudes and Values Study (NZAVS). Full copies of the NZAVS data files are held by all members of the NZAVS management team and advisory board. A de-identified dataset containing the variables analysed in this manuscript is available upon request from the corresponding author, or any member of the NZAVS advisory board for the purposes of replication or checking of any published study using NZAVS data. The *Mplus* syntax used to test all models reported in this manuscript are available on the NZAVS website: www.nzavs.auckland.ac.nz. Our *Mplus* syntax is also available on the Open Science Framework (<https://osf.io/3xw7t/>), as well as in the Online Supplementary File.

DO and CS contributed equally to the composition of this manuscript, including the study design, testing, and data collection, as well as the data analyses and subsequent writing of the manuscript. Both authors approved the final version of the manuscript for submission.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jrp.2020.103979>.

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