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Bounded Openness: The Effect of Openness to Experience on Intolerance is Moderated by Target Group Conventionality

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Abstract

Openness to experience is consistently associated with tolerance. We suggest that tests of the association between openness to experience and tolerance have heretofore been incomplete because they have primarily focused on prejudice towards unconventional target groups. We test (1) the individual difference perspective, which predicts that because people who are high in openness are more open to diverse and dissimilar people and ideas, they will express more tolerance than people who are low in openness and (2) the worldview conflict perspective, which predicts that people high and low in openness will both be intolerant towards those with different worldviews. Four studies, using both conventional and unconventional target groups, find support for an integrative perspective. People high in openness do appear more tolerant of diverse worldviews compared to people low in openness; however, at the same time, people both high and low in openness are more intolerant of groups whose worldviews conflict with their own. These findings highlight the need to consider how individual difference variables and features of the target groups may interact in important ways to influence the expression of prejudice.

Bounded Openness: The Effect of Openness to Experience on Intolerance is Moderated by Target Group Conventionality

Openness to experience is a basic dimension of personality that distinguishes between people who prefer and seek out novelty and variety from those who prefer and seek out familiarity and routine (McCrae, 1994, 1996; McCrae & Costa, 1997). People high in openness are typically characterized as broad-minded, intellectual, curious, imaginative, unconventional, and interested in art and literature. In contrast, people low in openness are typically characterized as being more closed-minded, lacking curiosity, and preferring familiar people, places, and things (McCrae, 1987, 1996; McCrae & Costa, 1997; Roccas, Sagiv, Schwartz, & Knafo, 2002; Xu, Mar, & Peterson, 2013). One common conclusion is that people who are low in openness are more intolerant than people who are high in openness.[1] For example, people high in openness initiate more intergroup contact (Jackson & Poulsen, 2005), report less prejudice and discrimination (Sibley & Duckitt, 2008), and form more positive impressions of individual outgroup members (Flynn, 2005) than people low in openness. A recent meta-analysis found that across 71 studies, the association between openness to experience and self-reported prejudice was $r = -.30$ (95% CI [-.32, -.27]; Sibley & Duckitt, 2008), suggesting a medium-sized and consistent effect. The association between openness to experience and tolerance cannot be reduced to self-report biases because they also emerge when peer-rating methods are used (Cohrs et al., 2012). To better understand the underpinnings of this relationship, we will test two distinct perspectives—the individual difference and worldview conflict perspectives—that both challenge and illuminate the nature of this relationship.

Individual Difference Perspective

The traditional way of understanding the association between openness and tolerance is what we refer to as the *individual difference perspective*. The individual difference perspective states that individual differences in motivations and cognitive styles (e.g., broad minded, curious) lead people who are high in openness to be more tolerant and people low in openness to be more intolerant. This perspective is built upon three related lines of research (see Flynn, 2005, p. 817). The first is that people high in openness score high on measures of Universal-Diverse Orientation, which suggests that they are more accepting of both similarities and differences among people (Strauss & Connerley, 2003; Thompson, Brossart, Carlozzi, & Miville, 2002; cf. Albrecht, Dilchert, Deller, & Paulus, 2014). The second is that people low in openness typically score high on measures of right-wing authoritarianism (Cohrs et al., 2012; Sibley & Duckitt, 2008), religious fundamentalism (Saraglou, 2002), and other conservative values (Jost et al., 2003), all of which are consistently linked with prejudice and discrimination (Brandt & Reyna, 2010, 2014; Cohrs et al., 2012; Hall, Matz, & Wood, 2010; Jost, Nosek, & Gosling, 2008; Sibley & Duckitt, 2008). Research inspired by the dual-process motivational model of prejudice (Duckitt, Wagner, du Plessis, & Birum, 2002) shows that right-wing authoritarianism mediates the association between low openness to experience and intolerance (Cohrs et al., 2012; Sibley & Duckitt, 2008; Sibley, Harding, Perry, Asbrock, & Duckitt, 2010), although openness maintains a (smaller) direct relationship with tolerance (Sibley & Duckitt, 2008). The third is that people high in openness are more likely to seek out new information and experiences that challenge the status quo, whereas people low in openness are more likely to "seize and freeze" on their opinions (McCrae, 1987, 1996; Onraet, van Hiel, Roets, & Cornelis, 2011). For example, people low in openness may be more intolerant because they anchor on the threatening aspects of

outgroups and pay less attention to potentially stereotype-disconfirming evidence (Perry & Sibley, 2013).

Despite broad evidence for this perspective, complete tests of the individual difference perspective are lacking. Extant research has primarily observed the negative association between openness and tolerance only toward groups whose goals and values do not conform to traditional practices, beliefs, or conventions within the broader culture—that is, unconventional groups.[2] This is a problem because a consistent finding in the literature is that people who score lower on openness are more conventional than people who score higher on openness. Openness is also consistently correlated with both politicized and relatively non-politicized measures of conventional values, such as right-wing authoritarianism (Cohrs et al., 2012; Sibley & Duckitt, 2008; Sibley, Harding, Perry, Asbrock, & Duckitt, 2010; Sibley, Osborne, & Duckitt, 2012) and the traditionalism component of Schwartz's model of values (Parks-Leduc, Feldman, & Bardi, 2015; Roccas, Sagiv, Schwartz, & Knafo, 2002). This idea is even built into the commonly used items and subscales appearing in measures of openness (e.g. "I see myself as conventional, uncreative" from the Ten Item Personality Inventory; Gosling, Rentfrow, & Swann, 2003; "Unconventionality" from HEXACO, Lee & Ashton, 2004; "Values (unconventional)" from the Big Five Inventory, John & Srivastava, 1999; for more on this point see Charney, in press).

Finding that people high in openness are tolerant of people who are unconventional may not reflect an appreciation of diversity per se, but rather the tendency for people high in openness to like people similar to themselves (i.e., less conventional people).[3] A complete test of the individual differences perspective should assess intolerance towards both highly unconventional and highly conventional target groups who support cultural norms (e.g., religious people, business owners). If people high in openness are truly open to the perspectives and preferences

of dissimilar others, they should also show tolerance towards conventional groups who are unlike themselves.

Given current tests of the association between openness and tolerance, the individual difference perspective can be interpreted as predicting two different patterns of results (see Figure 1, Panel A). One particularly strong interpretation is that openness predicts more tolerance and less intolerance no matter the target group. However, this prediction entails the unreasonable prediction that people low in openness will be intolerant of people similar to themselves (cf. Byrne, 1971; van Osch & Breugelmans, 2012). A more nuanced prediction is that people high in openness will express similar levels of tolerance towards both conventional and unconventional groups, whereas people low in openness will be more tolerant of conventional groups and intolerant of unconventional groups (a moderated individual difference hypothesis, Figure 1, Panel B). In this case the cognitive and motivational correlates of openness, reviewed above, counteract bias and lead to more tolerant views of unconventional groups among people high in openness. The current state of the literature does not (and given the exclusion of conventional targets, cannot) distinguish between these two possible interpretations of the individual difference perspective.

Worldview Conflict Perspective

Other perspectives predict different patterns between openness and tolerance depending on the conventionality of the target group. One such perspective is the *worldview-conflict perspective* that identifies and tests how dissimilar values, morals, and worldviews between groups contributes to intolerance. According to the worldview-conflict perspective, people seek to affirm the validity of their own worldview, and thus express intolerance toward groups or individuals whose values and worldviews are (or perceived to be) dissimilar to their own (e.g.,

Brandt, Reyna, Chambers, Crawford, & Wetherell, 2014; Chambers & Melnyk, 2006; Henry & Reyna, 2007; Skitka, Bauman, & Sargis, 2005). This perspective follows from a long tradition that has examined how dissimilarity on a number of characteristics is associated with disliking (Byrne, 1971; Rokeach, 1960) and is largely consistent with value protection models (and other similar perspectives; Tetlock, 2003; Morgan, Mullen, & Skitka, 2010).

Research on both interpersonal and intergroup judgments has found that people are generally more tolerant of others who are similar rather than dissimilar to themselves (Byrne, 1971; Fawcett & Markson, 2010; van Osch & Breugelmans, 2012). Differences in worldviews and values constitute the most potent of dissimilarities and are strong predictors of intolerance (Chambers & Melnyk, 2006; Chambers, Schlenker, & Collisson, 2013; Crawford, 2014; Rokeach, 1960; Wetherell, Benson, Reyna & Brandt, 2015). Studies across decades and disciplines find that worldview differences (i.e., liberal vs. conservative) were better predictors of prejudice than racial differences (i.e., Blacks vs. Whites; Chambers et al., 2013; Iyengar & Westwood, in press; Rokeach, 1960). This type of effect extends to the realm of dating and mating, where researchers find that the similarity of spouses' politics and religion are stronger predictors of mate-choice than their similarity in personality and physical features (Alford, Hatemi, Hibbing, Martin, & Eaves, 2011).

The worldview-conflict perspective predicts that the openness of the perceiver serves as a proxy for more liberal-related values that may be more common among unconventional groups (e.g., minorities, gays and lesbians), compared to conventional groups (e.g., Evangelical Christians) who are likely to endorse more traditional values (cf. Charney, in press; Cohrs et al., 2012; Parks-Leduc, Feldman, & Bardi, 2015; Roccas, Sagiv, Schwartz, & Knafo, 2002; Sibley & Duckitt, 2008; Sibley et al., 2010). That is, the openness-tolerance relationship observed in the

literature may simply reflect worldview similarity between people who score high on openness and people with more unconventional views. The predicted pattern of results is in Figure 1 (Panel C). Like the individual difference perspective, the worldview-conflict perspective predicts that people low in openness will be more intolerant of unconventional groups than conventional groups; however, it makes the novel prediction that people high in openness will be more intolerant of conventional groups than unconventional groups. This possibility has yet to be fully tested because of the exclusion of conventional target groups in the literature.

Conventionality as a Moderator of Tolerance

There are some hints in the existing literature that the target group's conventionality will moderate the association between openness and tolerance. The dual process model of prejudice predicts that low openness is an underlying disposition of right-wing authoritarianism (Duckitt et al., 2002; Perry & Sibley, 2012; Sibley & Duckitt, 2008) and right-wing authoritarianism is more strongly correlated with prejudice of unconventional groups (called "dangerous groups" by the authors) than of low status groups (called "dissident groups" by the authors; Asbrock, Sibley, & Duckitt, 2010; Duckitt, 2006). This could be preliminary evidence for the moderated individual difference perspective (see Figure 1, Panel B); however, these prior studies did not include any highly conventional groups and so cannot be used to make inferences about the full pattern of results.

Other work on political ideology and beliefs, including right-wing authoritarianism, also provides support more in line with the worldview conflict perspective. For example, several studies have shown that political liberals and conservatives both express prejudice (Chambers, Schlenker, & Collisson, 2013; Iyengar & Westwood, in press), political intolerance (Crawford & Pilanski, 2014), and a willingness to discriminate (Iyengar & Westwood, in press; Wetherell,

Brandt, & Reyna, 2013) toward ideological outgroups compared to ideological ingroups (for reviews see Brandt et al., 2014; Brandt, Wetherell, & Crawford, in press). Similarly, right-wing authoritarianism – often negatively correlated with openness – is associated with prejudice towards left-wing groups, but tolerance towards right-wing groups (Chambers et a., 2013). These results are more in line with the worldview conflict perspective (see Figure 1, Panel C) and suggest that the association between openness and tolerance may end up reflecting the same cross-over interactions observed between perceiver ideology and target ideology; however, the prior studies on ideology have not included measures of openness or conventionality and so cannot directly test hypotheses about openness.

The Current Studies

We conducted four studies to test four basic hypotheses about the relationship between openness and tolerance. We test the individual difference hypothesis (Figure 1, Panel A), which predicts a main effect of openness, such that those higher in openness will be more tolerant towards social groups compared to those lower in openness. We also test the moderated individual difference perspective (Figure 1, Panel B), which predicts a spreading interaction, such that people low in openness show more intolerance of unconventional compared to conventional groups, but people high in openness show equal levels of tolerance towards both unconventional and conventional groups. Finally, we test the worldview conflict hypothesis (Figure 1, Panel C), which predicts a crossover interaction between openness and conventionality, such that people both high and low in openness will express intolerance towards social groups with dissimilar worldviews (i.e., conventional and unconventional social groups respectively), but tolerance toward those who share their worldviews.

Although these perspectives diverge in certain respects, some elements of these perspectives could function simultaneously. For example, it is possible that people high in openness do tend to be more accepting of diverse views compared to those lower in openness (consistent with the moderated individual difference perspective), but also show more tolerance toward those whose worldviews are similar rather than dissimilar to their own (consistent with the worldview conflict perspective). This could manifest in a spreading interaction that only crosses over at the highest levels of openness (Figure 1, Panel D). Furthermore, there may also be a main effect of conventionality, such that participants in general may express more tolerance of conventional compared to unconventional groups because these groups are often the dominant and high status groups in society (cf. Fiske, Cuddy, Glick, & Xu, 2002). By directly measuring worldview conflict in Studies 3 and 4, we are able to test worldview conflict as a mediator and see if its effects on tolerance vary for people high and low in openness.

Measuring Conventionality. We take two approaches to measuring conventionality. The first is to obtain conventionality ratings of several different target groups from separate samples of participants (in our case, the samples from Study 3) and use the average conventionality ratings for these target groups to classify the conventionality of groups from datasets wherein conventionality ratings were not available (in our case, Studies 1 and 2). This nomothetic strategy reflects the assumption that there is consensus in the conventionality of groups within a particular social setting and that the mean of the sample best represents that consensus. This is a pragmatic assumption that allows us to make use of the data in our first two studies, which were culled from nationally representative samples that did not include conventionality ratings. However, this approach, while informative, is not ideal given that participants' perceptions of conventionality are likely to vary somewhat from person to person (cf. research on moral

conviction; Skitka, Bauman, & Sargis, 2005; Ryan, 2014). Therefore, in Studies 3 and 4, we directly assess each person's own (idiosyncratic) perception of the target group's conventionality. This ideographic approach takes advantage of possible variation in perceptions of conventionality and does not require that we make the consensus assumption.

Probing Interactions. In many extant samples, the mean level of openness is higher than the midpoint (see e.g., Gosling, Rentfrow, & Swann, 2003; Lee & Ashton, 2004). To focus on people who are genuinely high or low in openness, we define high and low openness as people selecting the "agree," "moderately agree," or "slightly well" point of the scale on average and we define low openness as selecting the "disagree," "moderately disagree," or "slightly poorly" point of the scale on average. To get the most out of our data, we probed the openness measure at each point of the scale (e.g., for a 7-point scale, at each whole number between 1 and 7). This is a variation of the Johnson-Neyman method for probing interactions (Preacher, Rucker, & Hayes, 2007). With this approach, we can see at what points of openness the conventionality of the target groups leads to more or less intolerance. Combined, these strategies clearly define people who are genuinely high and low in openness and provide a better sense of what levels of openness matter for determining tolerance of different groups. Because the perspectives in Figure 1 predict different results depending on both the level of openness, but also the conventionality of the target groups, we probe the interactions at high and low levels of both openness and conventionality.

Estimating Effect Sizes. There is no agreed upon method for calculating effect sizes from multi-level models with random slopes (e.g. Peugh, 2010), which is the type of model we rely on across our four studies. To give readers a sense of the size of the effects, we have adopted two strategies. First, we rescaled all of our predictor and outcome variables to range from 0 to 1

so that each coefficient can be interpreted as the degree of change in the outcome variable as the predictor variable changes from 0 to 1 (see Baguley, 2009). That is, a slope of .30 is a 30% difference in the outcome variable when comparing the minimum and the maximum value of the predictor variable. Second, we calculated the estimated means at ± 1 SD of the conventionalism mean and at the high and low points of the openness scale (our points of probing the interactions, described above). We then calculated a type of *d*-score by first finding the difference between these two estimated means and then dividing that difference by the standard deviation of the outcome variable. We call this $d_{\hat{y}}$ to highlight that it is a *d*-score based on estimated means. We used the following equation:

$$d_{\hat{y}} = \frac{\widehat{y_{dif}}}{SDy} \quad (1)$$

In this equation, $\widehat{y_{dif}}$ is the difference between the two estimated means and SDy is the standard deviation of the outcome variable (see Hofmann, Wisneski, Brandt, & Skitka, 2014 for a similar strategy). Neither of these methods is precisely the same as the typical standardized beta or Cohen *d* effect sizes, but uses a similar statistical approach and will help the reader better intuit the size of the effects and to compare the effects across studies.

Studies 1 & 2

The aim of Studies 1 and 2 was to test the plausibility of the individual difference and worldview conflict perspectives for understanding the relationship between openness and tolerance (see Figure 1). We used two different surveys with nationally representative data from the American National Election Studies.

Method

Participants and Procedure[4]

Study 1. Panel 4 of the American National Election Studies (ANES) Evaluations of Government and Society Study included a nationally representative sample of a total of 1,314 participants, of whom 1,253 completed the entire survey (sample sizes vary in our analyses due to missing or incomplete responses on some of our key variables).

Study 2. The ANES 2012 Times Series study included a large, nationally representative sample of American adults using a pre-post election design. The data set included a total of 5,914 participants, of whom 5,510 completed both the pre- and post- measures (sample sizes vary in our analyses due to missing or incomplete responses on some of our key variables).

Measures

Study 1. Our key dependent measures of intolerance were respondent's feeling thermometer ratings (from 0 = *very cold or unfavorable feeling* to 100 = *very warm or favorable feeling*) (reverse scored) for each of four target groups (Blacks, Whites, Hispanics, Muslims), and their willingness to vote (from 1 = *a lot more likely* to 5 = *a lot less likely*) for a Presidential candidate from each of nine target groups (Catholic, Jew, Muslim, Person with no religion, Evangelical or "Born again" Christian, Woman, Gay or Lesbian, Black, Hispanic). Higher scores on each measure reflect more intolerance.

Participants also completed the Ten Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003). The two items from the TIPI assessing openness to experience asked participants to what extent they would describe themselves as "open to new experiences and complex" and "conventional and uncreative" (reverse coded) on a scale with the labels 1 (*disagree strongly*), 2 (*disagree moderately*), 3 (*disagree a little*), 4 (*neither agree nor disagree*), 5 (*agree a little*), 6 (*agree moderately*), and 7 (*agree strongly*). Responses to these two items

were averaged (r = .25) to form a composite openness score (with higher scores indicating more openness).

In addition, participants reported their age, gender, race/ethnicity, education level (from 1= *no formal education* to 14= *professional or Doctorate degree*), household income level (from 1= *less than $5,000* to 19= *$175,000 or more*), and political ideology (from 1= *very liberal* to 7= *very conservative*). We included these measures as covariates because they may predict attitudes toward the various groups in our study and it is important to rule out these variables as possible explanations for the effects we observe.[5]

Study 2. Intolerance was measured with a feeling thermometer (from 0 = *very cold or unfavorable feeling* to 100 = *very warm or favorable feeling*) (reverse scored) for each of 16 target groups (see Table 1 for the complete list). Participants completed the same openness measure from the TIPI, but with slightly different instructions. Respondents were asked how well each word pair ("open to new experiences, complex" and "conventional/uncreative" [reverse-scored]) described them on a scale with labels 1 (*extremely poorly*), 2 (*somewhat poorly*), 3 (*a little poorly*), 4 (*neither poorly nor well*), 5 (*a little well*), 6 (*somewhat well*), and 7 (*extremely well*). These two items were averaged (r = .24) to form a composite openness score.

Participants' age (13 age groups, from 1= *17-20 year olds* to 13= *75 years or older*), gender, race/ethnicity, education level (from 1= *less than high school credential* to 5= *graduate degree*), household income level (from 1= *under $5,000* to 28= *$250,000 or more*), and political ideology (from 1= *extremely liberal* to 7= *extremely conservative*) were covariates in the models.

Conventionality of each of the target groups in both studies was indexed with the mean conventionality scores provided by the separate sample of participants who completed Study 3 (conventionality was not assessed in Studies 1 and 2). Study 3 participants were asked to

evaluate many of the groups measured in the two ANES datasets (Studies 1 and 2) on the following item: "Please indicate the extent to which you see them as conventional; that is, they conform to traditional societal practices and beliefs." Responses could range from 1 (*not at all conventional*) to 7 (*very conventional*).

Results

Mean conventionality scores (obtained in Study 3) and openness-tolerance correlations for each target group are displayed in Table 1. Openness is associated with tolerance, but the strength and direction of the association depends on the target group. In our primary analyses, we test if this variation is due to the conventionality of the target group.

The data in both studies were nested and so were treated as multilevel with intolerance (i.e., feeling thermometers, willingness to vote) and the target's conventionality scores (obtained in Study 3) treated as within participants and with openness to experience scores and demographic covariates (e.g., political ideology, age, gender, racial ethnicity) treated as between participants. Two-level multilevel models were estimated with MPlus version 6 (Muthén & Muthén, 1998-2010), where intolerance (i.e., feeling thermometer and willingness to vote ratings) was regressed on openness, conventionality, their interaction, and the demographic covariates. All variables were rescaled to range from 0 to 1 and were mean centered prior to entry, except for respondent's gender (-.5 = Male, .5 = Female) and racial ethnicity (-.5 = Whites, .5 = Non-Whites), which were contrast coded, and openness, which was centered on its mid-point (in line with our data analytic strategy outlined previously). The results of these models for both studies are displayed in Table 2 and Figure 2.

Feeling Thermometer Ratings

In Study 1, there were main effects of target conventionality, indicating that participants expressed greater intolerance (i.e., lower feeling thermometer ratings) for target groups perceived as unconventional than for target groups perceived as conventional, and of openness to experience, indicating that participants low in openness expressed greater intolerance for the target groups overall than did participants high in openness. These main effects were qualified by a significant cross-level interaction between target conventionality and openness to experience. The interaction was probed by re-estimating the model at ±1 *SD* of the conventionality mean and at the moderately disagree/agree values of the openness to experience measure (see Figure 2, left panel). For unconventional target groups, openness negatively predicted intolerance (b = -.16, SE = .03, $p < .001$, $d_{\hat{y}}$ = -.40); however, for conventional target groups, openness was unrelated to intolerance (b = -.02, SE = .03, p = .59, $d_{\hat{y}}$ = -.04). When focusing on participants lower (moderately disagree) vs. higher (moderately agree) in openness, the effect of target conventionality on intolerance is negative for both, but much stronger in the case of people low in openness (b = -.30, SE = .02, $p < .001$, $d_{\hat{y}}$ = -.88) than those high in openness (b = -.18, SE = .01, $p < .001$, $d_{\hat{y}}$ = -.52).

A virtually identical pattern of results was found for feeling thermometer ratings in Study 2. Main effects of both target conventionality and openness to experience indicated that intolerance was greater for target groups perceived as unconventional than for those perceived as conventional, and that participants low in openness expressed greater intolerance for the target groups overall than did participants high in openness. These main effects were qualified by a significant interaction between conventionality and openness to experience (Figure 2, middle panel). For unconventional target groups, openness negatively predicted intolerance (b = -.14, SE = .01, $p < .001$, $d_{\hat{y}}$ = -.36); however, for conventional target groups, openness to experience was

unrelated to intolerance (b = .01, SE = .01, p = .68, $d_{\hat{y}}$ = .01). When focusing on participants' lower (somewhat poorly) vs. higher (somewhat well) in openness, the effect of target conventionality on intolerance is negative for both, but twice as strong in the case of people low in openness (b = -.28, SE = .01, p < .001, $d_{\hat{y}}$ = -.68) than those high in openness (b = -.13, SE = .01, p < .001, $d_{\hat{y}}$ = -.31).

Willingness to Vote

The results for the willingness to vote ratings began to deviate from those for feeling thermometers. A significant main effect of target conventionality (and non-significant effect of openness to experience) was qualified by a significant interaction between conventionality and openness (Figure 2, right panel). For unconventional target groups, openness to experience predicted less intolerance (b = -.10, SE = .02, p< .001, $d_{\hat{y}}$ = -.28), whereas for conventional target groups, openness to experience predicted *greater* intolerance (b = .05, SE = .02, p= .03, $d_{\hat{y}}$ = .14). When focusing on participants low vs. high in openness, the effect of target conventionality on intolerance is negative for both, but twice as strong in the case of people low in openness (b = -.28, SE = .02, p< .001, $d_{\hat{y}}$ = -.79) than those high in openness (b = -.13, SE = .02, p< .001, $d_{\hat{y}}$ = -.38).

Discussion

The results of Studies 1 and 2 offer the most support for the moderated individual difference hypothesis (compare Figure 1, Panel B with Figure 2). Using a nomothetic approach for assessing conventionality, the data consistently show that the conventionality of the target moderates the association between openness and intolerance. When considering unconventional target groups, low openness was associated with more intolerance than high openness, consistent with meta-analytic conclusions and the individual difference hypothesis (Sibley & Duckitt,

2008). However, when considering conventional target groups, openness was either no longer associated with intolerance (feeling thermometer ratings in Studies 1 and 2), or predicted slightly higher levels of intolerance (willingness to vote in Study 1) as predicted by the moderated individual difference perspective. These results and effect sizes were consistent across two different representative samples using several target groups, across two different measures and manifestations of intolerance, and when controlling for a variety of demographic variables. These results are not consistent with the worldview conflict perspective; however, there are shortcomings of these initial two studies that may mask support for this perspective.

Study 3

In Studies 1 and 2, we found support for the moderated individual difference perspective, suggesting that conventionality is a robust moderator. To explore the interaction between openness and conventionality more directly in Study 3 we addressed several shortcomings of the first two studies and improved the methods in several ways. First, in Studies 1 and 2, participants did not rate the conventionality of the target groups. Instead, we relied on ratings made by a separate sample of participants for a nomothetic approach. In the present study we used an idiographic approach, so that participants rated the conventionality of the target groups as well as their level of intolerance towards these groups. Second, in Studies 1 and 2, our measure of openness consisted of only two items, and therefore was unable to capture the full depth and breadth of the openness construct. In the present study we include more detailed measures of openness.

Third, we included more target groups who spanned the full spectrum of conventionality, from highly unconventional and unorthodox social groups to ones viewed as more conventional and mainstream. This is important in order to provide a complete test of the individual difference

and worldview conflict perspectives. For example, under-representing conventional groups (as done in the ANES samples used in Studies 1 and 2) could disadvantage the worldview-conflict perspective and favor the moderated individual difference perspective. By including a wider array of groups, we are able to provide a fairer test of these two perspectives. Fourth, in addition to the demographic items, we included a short need for cognitive closure scale as a covariate (Houghton & Grewal, 2000; Webster & Kruglanski, 1994). People low in openness engage in a "seizing and freezing" process when judging how threatening the world seems to be (Perry & Sibley, 2013). This cognitive style is one possible mechanism underlying the predictions of the individual difference perspective (Onraet et al., 2011).

Fifth, we directly measured participants' perceptions of their dissimilarity to the target groups in terms of their political and social beliefs. This allowed us to test if perceived worldview-conflict mediates the effects of openness, conventionality, and intolerance, one of the critical assumptions distinguishing the worldview-conflict perspective from the individual difference perspective.

The worldview conflict perspective predicts that people high in openness should see conventional groups as having a more conflicting worldview, and this perceived worldview conflict should predict intolerance of conventional groups. Conversely, people low in openness should see unconventional groups as having a more conflicting worldview, and this perceived worldview conflict should predict intolerance of unconventional groups. That is, the worldview conflict perspective predicts a moderated-mediation hypothesis whereby the perceived conventionalism of the target groups predicts perceived worldview conflict with those groups, which in turn should predict intolerance. Importantly, the association between conventionalism and worldview conflict should be in opposite directions for people high and low in openness

(i.e., positive and negative relationships, respectively, resulting in a cross-over interaction pattern).

The individual difference perspective makes a diverging set of predictions regarding the role of perceived worldview conflict. Essentially, the prediction is that people both high and low in openness *recognize* when there are conflicting worldviews, but that this recognition is less likely to *produce* intolerance among people high in openness. The individual difference perspective would predict that people high and low in openness would recognize that people who are conventional have dissimilar and conflicting worldviews—a similar pattern as the one predicted by the worldview conflict perspective. However, the perspectives differ in how perceived worldview conflict predicts intolerance. For people who are high in openness (compared to low openness), perceived worldview conflict should be only weakly (if at all) associated with intolerance, reflecting the idea that openness leads to less intolerance of groups who have different beliefs. Thus, the individual difference perspective predicts that the link between worldview conflict and intolerance will be stronger for people low in openness compared to people high in openness (an interaction), whereas the worldview conflict perspective predicts that the link between worldview conflict and intolerance will be similar for people high and low in openness (a main effect, no interaction).

In our third study, we recruited convenience samples from three distinct locations to (a) substantially increase our sample size and (b) diversify the populations to which our samples will likely generalize. The measures and study procedures were identical in all three samples. The study was a multilevel design with target groups nested within participants, such that each participant completed measures of intolerance, perceived conventionality, and perceived

worldview conflict for each target group, as well as participant-level measures including openness to experience, need for closure, and demographic information.

Method

Participants and Procedure

Sample 1 was a student sample recruited from a large Midwestern liberal arts university (68 Men, 173 Women, *M* age = 19.9, *SD* age = 2.6). Sample 2 was a student sample recruited from a small East Coast public liberals arts college (21 Men, 127 Women, *M* age = 19.3, *SD* age = 2.5). Sample 3 was a community sample recruited from Amazon.com's Mechanical Turk (200 Men, 125 Women, 2 no response, *M* age = 30.4, *SD* age = 11.0). In all cases, we only analyzed data from participants who indicated they were born in the United States (number of excluded participants: Sample 1 = 28, Sample 2 = 9, Sample 3 = 16). Participants completed the survey online and were compensated with either course credit (Samples 1 & 2) or a small monetary payment (Sample 3).

Measures

Intolerance was measured within-participants and was a feeling thermometer (0 = *very cold, dislike quite a lot*, 100 = *very warm, like quite a lot,* reverse scored) for 30 different diverse target groups (see Table 3). Perceived conventionalism was measured for each group by asking participants to "indicate the extent to which you see them as conventional; that is, they conform to traditional societal practices and beliefs" (1 = *not at all conventional*, 7 = *very conventional*). Perceived worldview conflict, our mediator variable, was measured for each group by asking participants to "indicate the extent to which you see them as holding political or social beliefs different from your own" (1 = *not at all different from me*, 7 = *very different from me*).

Participants completed the feeling thermometers first, followed by the measures of perceived conventionality and dissimilarity, which were presented in a random order.

Openness to experience has been operationalized in many different ways across personality taxonomies and conceptualizations of the openness construct (Ashton & Lee, 2007, 2009; Costa & McCrae, 1995; Gosling et al., 2003; Rammstedt & John, 2007). Rather than relying on items from any one given measure of openness to experience, we chose to amalgamate the two openness to experience items from the TIPI (Total Sample r = .34; Gosling et al., 2003), 9 items from the HEXACO inventory (Total Sample α = .80; e.g., "I would enjoy creating a work of art, such as a novel, a song, or a painting." Ashton & Lee, 2009),[6] and the two items based on the Brief Big Five Inventory (Total Sample r = .37; e.g., "I have an active imagination."; Rammstedt & John, 2007). The items were completed on a seven-point scale with the labels, 1 = *strongly disagree*, 2 = *disagree*, 3 = *somewhat disagree*, 4 = *neither agree nor disagree*, 5 = *somewhat agree*, 6 = *agree*, 7 = *strongly agree*. In all three samples, the items for each scale were first averaged and then the scores for each scale were averaged, creating a measure of openness that gives equal weight to all three conceptualizations of openness (Sample 1 α = .75; Sample 2 α = .80; Sample 3 α = .87; Total Sample α = .81).

Some work suggests that people low in openness show more intolerance because they are more likely to seize and freeze on their negative attitudes (Perry & Sibley, 2013). Therefore we included a 20-item need for closure scale (Sample 1 α = .57; Sample 2 α = .71; Sample 3 α = .71; Total Sample α = .67; Houghton & Grewal, 2000), based on the original 46-item need for closure scale (Webster & Kruglanski, 1994), to control for self-reported differences in this cognitive style. We also included a variety of demographic participant-level measures, including age, ethnicity (-1 = Non-White, 1 = White), gender (-1 = Women, 1 = Men), education (1 = Some

high school, no diploma, 8 = Doctoral degree), family income (1 = Under $25,000, 5 = More than $250,000), and political ideology (1 = Extremely liberal, 7 = Extremely conservative) which we treated as covariates in our models.

Results

The correlations between openness and intolerance for each of the target groups are provided in Table 3. Consistent with the previous two studies, the association between openness and intolerance varies depending on the target group. Our analyses try to account for this variation.

Analytic Strategy

We used two-level multi-level models similar to those in Studies 1 and 2, estimated with MPlus version 6 (Muthén & Muthén, 1998-2010), using the same 0 to 1 recoding method, and the same centering strategy for the predictor variables and covariates. Because the same study was conducted in each of the three samples, we combined the samples for ease of presentation. We used a multi-group, multi-level model to test if it was statistically justifiable to combine the samples. For each of the models, we first ran a model where none of the paths were constrained to be equal across the three samples. Then, we ran a second model where all of our primary paths (i.e., all of the paths with the exception of the covariates because we do not have any predictions about the consistency of their effects) are constrained to equality between the three samples. Across each of the models reported below, the constrained model always had a lower sample-size adjusted BIC and so is a better fit for the data (Δ in sample-size adjusted BIC ranged 22.14 to 53.7; $\Delta M = 36.9$), indicating it is justifiable to combine the samples.

Primary Model

The primary model included conventionality, openness to experience, and their interaction predicting intolerance, along with the covariates (see Table 4). There were main effects of both openness and conventionalism on intolerance, but these were qualified by a significant cross-level interaction between perceived conventionality and openness to experience (Figure 3, left panel). For unconventional target groups, openness predicted less intolerance (b = -.47, SE = .06, $p < .001$, $d_{\hat{y}}$ = -.70); however, for conventional target groups, openness marginally predicted more intolerance (b = .09, SE = .05, p = .09, $d_{\hat{y}}$ = .21). When focusing on participants lower (disagree) vs. higher (agree) in openness, we found that for participants lower in openness there was a significant and negative effect of conventionalism on intolerance (b = -.47, SE = .06, $p < .001$, $d_{\hat{y}}$ = -.98). This comparison was already significant at the "somewhat agree" point on the scale (see dashed vertical line in Figure 3). For people who were higher in openness there was no effect of conventionalism (b = -.03, SE = .03, p = .26, $d_{\hat{y}}$ = -.06), but the effect of conventionalism begins to become positively associated with intolerance for people who strongly agree with the openness items (b = .08, SE = .04, p = .054, $d_{\hat{y}}$ = .17).

Similar analyses were undertaken for the worldview conflict mediator variable (Figure 3, right panel). There was no main effect of openness and a significant main effect of conventionality; however, these estimates were qualified by a significant interaction. We found that for unconventional target groups, openness predicted less worldview conflict (b = -.18, SE = .05, $p < .001$, $d_{\hat{y}}$ = -.40); however, for conventional target groups, openness predicted more worldview conflict (b = .20, SE = .05, $p < .001$, $d_{\hat{y}}$ = .46). When focusing on participants lower vs. higher in openness, we found that for participants lower in openness there was a significant and negative effect of conventionalism on worldview conflict (b = -.41, SE = .07, $p < .001$, $d_{\hat{y}}$ = -.76). However, for people who averaged "agree" with the openness items there was no effect of

conventionalism (b = .05, SE = .03 p = .14, $d_{\hat{y}}$ = .09) and the effect of conventionalism significantly reverses for people who "strongly agree" with the openness items (b = .16, SE = .05, p = .002, $d_{\hat{y}}$ = .31).

The findings with both intolerance and worldview conflict as dependent measures are consistent with the integrative perspective (compare Figure 3 with Figure 1, Panel D). On the one hand, as predicted by the moderated individual difference perspective, intolerance and worldview conflict are higher with unconventional versus conventional groups at lower levels of openness and this difference narrows as one becomes more open. However, consistent with the integrative perspective, at the highest levels of openness the once-null differences between evaluations of conventional and unconventional groups start to turn positive with those particularly high in openness more intolerant of conventional vs. unconventional groups. Next, we test to see if these patterns are driven by perceived worldview conflict.

Mediation Model

To test the moderated-mediation predictions, we used a multi-level mediation model, including all of the covariates. The primary results are within-subjects, where we regressed intolerance on worldview conflict and conventionalism, and we regressed worldview conflict on conventionalism. We specified each of these three paths as random coefficients and included their cross-level interactions with openness to experience. Each of these cross-level interactions were significant (all p's < .001) and so we estimated models at the "agree" and "disagree" points of the openness scale. We also further estimated the model at the "strongly agree" point on the openness scale because the analyses in the previous paragraph on worldview conflict suggest that conventionalism predicts more worldview conflict at the highest levels of openness. Figure 4 contains the mediation models at these three levels of openness.

Conventionalism was positively associated with perceived worldview conflict for people highest in openness (Figure 4A), but was negatively associated with perceived worldview conflict for people low in openness (Figure 4C). Consistent with the worldview conflict perspective, perceived worldview conflict was positively associated with intolerance at all levels of openness. Contrary to the individual difference perspective, the association between worldview conflict and intolerance was *stronger* among people high in openness (rather than weaker, as would be predicted). The indirect (mediated) effects of perceived conventionalism on intolerance were significantly different from zero for both people highest (i.e, "strongly agree;" indirect effect = .09, *SE* = .03, $p = .002$) and low (i.e., "disagree;" indirect effect = -.11, *SE* = .03, $p < .001$) in openness. The indirect effect for people high in openness (i.e. "agree") was not significant (indirect effect = .03, *SE* = .02, $p = .11$). The indirect effects at the three points probed were all significantly different from one another (all differences > .06, all p's < .001).

Discussion

The Study 3 interaction between conventionalism and openness is not entirely consistent with either the moderated individual difference or with the worldview conflict perspective. Instead, using an idiographic approach, this study provides support for an integrative perspective (Figure 1; Panel D) that includes elements from both predictions: (1) conventionalism is a less robust predictor of intolerance for people high compared to low in openness, suggesting that people high in openness are indeed more tolerant (as suggested by the moderated individual difference perspective); (2) at the highest levels of openness the effect of conventionalism on intolerance changes directions, suggesting that at the highest levels of openness there is evidence of intolerance (as suggested by the worldview conflict perspective); and (3) perceived worldview conflict predicts greater intolerance for people both high and low in openness (as suggested by

the worldview conflict perspective). Although people high in openness report similar levels of tolerance towards conventional and unconventional groups, suggesting some degree of openness and even-handedness, people high in openness were still intolerant of groups whose worldviews conflict with their own. These patterns provide support for an integrative model in which the mechanisms proposed by the moderated individual difference and worldview conflict perspectives work against each other for people high in openness. Consistent with this idea, when controlling for worldview conflict, the effect of conventionalism on intolerance among those highest in openness shifts from a positive effect to a non-significant negative effect (b = .16 → -.03).

Study 4

If worldview conflict is playing a role in intolerance for people at all levels of openness, a key question is what type of worldview conflict matters the most? We have primarily discussed worldview conflict as a difference in social and political beliefs; however, this is a very broad definition and operationalization of "worldview conflict." Previous research on intergroup attitudes have demonstrated the utility of distinguishing between different types of threats that groups can pose to individuals or group members (e.g., Cottrell & Neuberg, 2005; Stephan & Stephan, 2000). Drawing on Cottrell and Neuberg's (2005) sociofunctional threat-based approach, Crawford (2014) recently examined four different types of threat that potentially underlie threat to groups engaged in political conflict: symbolic threat (i.e., conflict over deeply-held values and beliefs), realistic threat (i.e., real or perceived competition over scarce resources), safety threat (i.e., perceived physical danger), and rights threat (i.e., perceived threat to democratic rights of oneself or others). Of these threats, symbolic threat uniquely predicted prejudice against ideologically dissimilar political activist groups.

Given these findings, along with other evidence showing that differences in values and morals are a robust form of worldview conflict (Chambers & Melnyk, 2006; Henry & Reyna, 2007; Skitka, Bauman, & Sargis, 2005; Wetherell et al., 2015; Wetherell, Brandt, & Reyna, 2013), symbolic threat may be a particularly robust mediator of the association between conventionalism and intolerance for people both high and low in openness (but with the association between conventionalism and intolerance in opposite directions depending on level of openness). Rights threat may be a mediator that is specific for people high in openness, as conventionality could be a signal that the conventional group is intolerant of others and may restrict their rights (e.g., religious conservatives restricting gay rights), which is unpalatable for people high in openness (cf. Crawford, 2014). Recent concerns by religious people in the United States over their rights of religious expression (Advance America, 2015; Cook, 2015), however, suggest that people both high and low in openness could be concerned about other groups restricting the rights of others. We do not have specific hypotheses for resource and safety threats, as these were unrelated to prejudice in Crawford's studies (2014), but have been associated with intergroup conflicts in other contexts (Asbrock, Sibley, & Duckitt, 2010; Cottrell & Neuberg, 2005; Duckitt, 2006; Stephan & Stephan, 2000). In short, although Study 3 showed that worldview conflict was an important factor in understanding the openness-intolerance relationship, the measure was not precise enough to identify which types of conflict are particularly relevant. Study 4 seeks to rectify this limitation.

People high in openness enjoy novelty (e.g., McCrae & Costa, 1997). We therefore tested a final possibility that conventional and unconventional groups are perceived as particularly boring vs. exciting and interesting, respectively, and that these perceptions in part explain the openness-intolerance relationship. For example, people high in openness may express positive

feelings and even political support for unconventional groups because these groups are more stimulating and unusual (e.g., minority groups or groups not often in the public eye) than conventional groups. We therefore included an item to assess the extent to which the target groups were perceived as boring or exciting.

There are three other changes in Study 4 worth noting. First, because we included additional measures to further dissect the openness-intolerance relationship, we selected significantly fewer target groups (eight instead of 30), focusing on groups that were likely to elicit intolerance among both high and low openness people (based both on the groups used in Studies 1 – 3 and related prior work, i.e., Chambers et al., 2013; Wetherell et al., 2013). Second, we used the long version of the HEXACO openness scale to capture the breadth of the openness construct within one single previously validated scale, rather than the amalgamation of scales we used in Study 3 or the abbreviated version we used in Studies 1 and 2. Finally, we expanded the measures of intolerance to include social distance along with attitudes and voting opposition to extend the scope of this research to more diverse manifestations of intolerance.

Method

Participants and Procedure

The sample was a community sample recruited from Mechanical Turk (265 Men, 188 Women, *M* age = 33.0, *SD* age = 10.6). We only analyzed data from participants who indicated they were born in the United States (number of excluded participants = 24), leaving a total of *n* = 429 participants in the final sample.

Measures

We selected the more extreme target groups from Study 3 that were also complements to each other (e.g., on different sides of an issue, such as Atheists compared to Evangelical

Christians). Our primary dependent variable, intolerance, was measured within-participants with three items that measured disliking, social distance, and voting opposition. We assessed liking with a (reverse scored) feeling thermometer (0 = *very cold, dislike quite a lot*, 100 = *very warm, like quite a lot*), as in the prior studies. Social distance was measured with one item reading, "how willing would you be to occasionally spend social time with a person who is [group name]" (1 = *not at all willing*, 7 = *very willing*) (reverse scored). Voting opposition was assessed with one item reading, "How willing would you be to vote for a candidate who is [insert group]" (1 = *not at all willing*, 7 = *very willing*) (reverse scored). The items were rescored to range from 0 to 1 and then averaged together for each group (Cronbach's α: .77-.89, *M*α = .84 across groups). Participants completed the same measure of conventionalism used in Study 3.

To measure worldview conflict we included eight new items modeled on the items used by Crawford (2014) to assess each of the different types of threats posed by the groups (i.e., symbolic, rights, safety, and resource threats). Table 6 includes the worldview conflict items, the average correlation between the two items for each measure, and the range of this correlation across each group. One additional item measured how boring or exciting the group was by asking participants to "indicate the extent to which you see the group as interesting and exciting (7) compared to typical and boring (1)."

We measured openness to experience with 15 items from the 100-item version of the HEXACO inventory (α = .84; Ashton & Lee, 2009).[7] Each item was answered on a five-point scale with the labels, 1 = *strongly disagree*, 2 = *disagree*, 3 = *neutral*, 4 = *agree*, 5 = *strongly agree*. We also included the same demographic participant-level measures in Study 3 as covariates.

Results

The correlations between openness and intolerance for each of the target groups can be found in Table 5 and are consistent with the previous three studies. We used the same analytic strategy as Study 3.

Primary Model

The primary model included conventionality, openness to experience, and their interaction predicting intolerance, along with all of the covariates (see Table 7). There were no main effects of openness or conventionality; however, there was a significant cross-level interaction between perceived conventionality and openness to experience when predicting intolerance (Figure 5). For unconventional target groups, openness predicted lower intolerance (b = -.46, SE = .06, $p < .001$, $d_{\hat{y}}$ = -.81); however, for conventional target groups, openness was a strong positive predictor of intolerance (b = .35, SE = .08, $p < .001$, $d_{\hat{y}}$ = .61). When focusing on participants lower in openness, the effect of target conventionality on intolerance is negative (b = -.38, SE = .08, $p < .001$, $d_{\hat{y}}$ = -.87); however for people higher in openness there was a reverse effect such that the effect of conventionalism on intolerance was positive (b = .24, SE = .03, $p < .001$, $d_{\hat{y}}$ = .55).

Similar analyses were undertaken for the four worldview conflict mediator variables and the measure of boredom/excitement (Table 7). For each of these mediator variables, there was a significant cross-over interaction between conventionalism and openness (Figure 6). For unconventional targets, openness to experience was a strong negative predictor of each measure (M $d_{\hat{y}}$ = -.51); however, for conventional targets, openness to experience was a positive predictor of each measure (M $d_{\hat{y}}$ = .68). Conventionalism predicted less worldview conflict and more excitement for people scoring lower on openness (M $d_{\hat{y}}$ = -.50) and it predicted more worldview conflict and less excitement for people scoring higher on openness (M $d_{\hat{y}}$ = .69). The pattern of

results for the measures of intolerance, worldview conflict, and boredom/excitement is most congruent with the worldview conflict perspective (compare Figures 5 & 6 with Figure 1, Panel C).

Mediation Model

We tested the moderated-mediation model with the covariates using a similar strategy as Study 3. The primary results are within-subjects, where we regressed intolerance on the four measures of worldview conflict, boredom/excitement, and conventionalism, and we regressed worldview conflict and boredom/excitement on conventionalism. We specified each of these paths as random coefficients and included their cross-level interactions with openness to experience. There were no reliable interactions between openness and the measures of worldview conflict when predicting intolerance (worldview conflict was always associated with intolerance regardless of level of openness) and so these interaction terms were removed from the models reported here. The remaining cross-level interactions were significant (all p's < .001) and so we estimated mediation models at the "agree" and "disagree" points of the openness scale (see Figure 7). All of the mediator measures were allowed to correlate and the covariates were also included in the model.

Conventionalism was positively associated with all of the measures of threat and negatively associated with perceived excitement among people high in openness (Figure 7A), but was negatively associated with all of the measures of threat and positively associated with excitement among people low in openness (Figure 7B). All measures of threat were positively associated with intolerance at all levels of openness, and excitement was negatively associated with intolerance at all levels of openness, suggesting that, contrary to the individual difference perspective but consistent with the worldview-conflict perspective, threat and excitement have

similar effects on intergroup perceptions and attitudes regardless of people's level of openness. This suggests that, at least for highly conventional and unconventional groups, the openness-tolerance relationship is due in part to a match between the target groups and the worldview orientation of those who are low vs. high in openness.

The indirect effects of perceived conventionalism on intolerance were significantly different from zero for all possible mediators for people high in openness; however, only symbolic threat, safety threat, and excitement were significant mediators for people low in openness (Table 8). All indirect effects for people high in openness were significantly different compared to the indirect effects for people low in openness (all p's < .02). Interestingly, the indirect effect through symbolic threat was a significantly stronger indirect effect than any of the other threat-related indirect effects in the model for people high and low in openness (all p's < .001). Symbolic threat was also a marginally (p = .07) or significantly stronger (p < .001) mediator than excitement for people high and low in openness, respectively. These results suggest that, although all of the possible mediators had an effect, symbolic threats were the most potent worldview conflict in this study across the openness spectrum. Interestingly, as we saw in Study 3, after statistically removing worldview conflict and boredom/excitement, conventionalism is associated with *more* tolerance towards conventional groups for people high in openness (b = .24 → -.04). The latter effect is significant, although it is rather small in size.

Discussion

The Study 4 interaction was clearly consistent with the worldview conflict perspective. When using groups that are particularly extreme and clearly contrast with each other on values, openness predicted tolerance of unconventional groups and intolerance of conventional groups. These differences were mediated by the specific measures of worldview conflict and

excitement/boredom, although the symbolic threats, which capture differences in deeply-held values, were the most potent. Interestingly, the measures of worldview conflict and excitement/boredom predicted intolerance for both people high and low in openness (although the indirect effects were not always significant at low openness), suggesting that people at all levels of openness are concerned about the symbolic, rights, resource, and safety threats of dissimilar groups. Based on these results, it appears that people high and low in openness rely on similar group-based perceptions, but these perceptions are directed at different types of target groups. By including these measures towards both conventional and unconventional groups, we were able to uncover this symmetry in intergroup perception processes among people high and low in openness.

General Discussion

In the quest to understand the fundamental antecedents of intolerance, openness to experience has played an important role. For decades, social scientists have identified openness to experience as a reliable predictor of tolerance in a variety of domains (see Sibley & Duckitt, 2008). Despite these advances, the research on the relation between openness and intolerance has to date been incomplete. Most extant research has focused on measuring intolerance toward unconventional or minority groups; however, little has been known about the relationship between openness and intolerance toward conventional or majority groups. We tested competing predictions about the relation between openness and intolerance when considering groups that span the spectrum of conventionality. Across the four studies we found support for the moderated individual differences, worldview conflict, and integrative hypotheses (see Figure 1).

Similarities and Differences across Studies

We thought that the typical association between openness and tolerance could be due to the conventionality of the target groups used in prior research. In this paper we tested this idea—and by extension the individual differences and worldview conflict approach—by assessing whether conventionality moderated the association between openness and intolerance, something heretofore missing from the extant literature. In all four studies we found that openness predicted tolerance of unconventional groups, replicating past work. We also found in all four studies that conventionality interacted with openness in predicting intolerance and perceived worldview conflict. These consistent interactions highlight the importance of considering the conventionality of the target group. In our latter studies (Studies 3 & 4), we observed that worldview conflict, and in particular symbolic threat, was always associated with more intolerance among people both high and low in openness, suggesting a common underlying factor for intolerance at both ends of the openness spectrum. It also indicates that the motivations and cognitive styles associated with high levels of openness do not prevent a robust link between perceptions of worldview conflict and intolerance.

There were also results that varied across studies. Most obviously, the precise nature of the interaction between openness and conventionality varied between studies. When our studies included primarily unconventional groups, our data best fit the moderated individual difference perspective (Studies 1 and 2). However, when they included primarily more extreme groups our data best fit the worldview conflict perspective (Study 4), and when they included a large range of groups our data best fit the integrative perspective (Study 3). Despite these differences, we consistently find an interaction between openness and conventionality. The differences in the precise form of this interaction likely stem from the target groups used in each study, ranging

from the primarily unconventional groups used in Studies 1 and 2 to a large number of conventional and unconventional groups in Study 3 and the purposefully extreme groups used in Study 4. The results across the four studies are not entirely consistent with either an individual difference or worldview-conflict perspective, showing support for one perspective or another depending on the precise groups included in a particular study.

We believe that the totality of results across the four studies suggest support for an *integrative perspective* in which openness does appear to reduce the difference in intolerance directed towards conventional and unconventional groups, especially when the groups are not particularly extreme or highly conventional (e.g., Study 3). Yet at the same time, people both low *and* high in openness are intolerant of groups who have conflicting worldviews. For people low in openness, worldview conflict and the intolerance-related aspects of low openness work in concert with one another to predict intolerance of unconventional groups. For people high in openness, worldview conflict and the tolerance-related aspects of high openness work in opposing directions to predict intolerance of conventional groups. These opposing effects for people high in openness may cancel out, as in Study 3, or one factor or another may be stronger in some contexts that highlight dissimilar values or the need to be tolerant (e.g., the differences between Studies 1 & 2 and Study 4). Consistent with this idea, when controlling for worldview conflict in both Studies 3 and 4, the effect of conventionalism on intolerance among those high in openness shifts from a positive effect to a negative effect (Study 3 highest levels of openness $b = .16 \rightarrow -.03$; Study 4 high levels of openness $b = .24 \rightarrow -.04$). That is, after statistically removing worldview conflict, conventionalism is associated with *more* tolerance towards conventional groups for people high in openness, although these effects are small. It appears that people high in openness are not universally open to new or different people, but rather show

"bounded-openness;" that is, their openness is constrained by the extent of the perceived differences associated with different target groups.

Implications

The results of the four studies provide a clearer understanding of the openness-tolerance relationship than what has been provided in prior literature. It also highlights the importance of using a diverse array of target groups. Only by including both conventional and unconventional target groups were we able to demonstrate that there are boundaries on the tolerance of people who are open to experience. This is consistent with research in social and political psychology that finds that using diverse target groups leads to different conclusions about prejudice (e.g., Brandt et al., 2014). Openness to experience, however, is just one of many possible individual difference variables that have been shown in the extant literature to predict intolerance, and we encourage researchers to fully examine the scope of intolerance associated with other personality variables. Agreeableness, honesty-humility, and conscientiousness, for example, could all be fruitfully explored for additional boundaries on the association between personality and prejudice. For example, perhaps the association between agreeableness and tolerance is limited to low status groups and does not extend to high status groups, consistent with work that shows that social dominance orientation, a correlate of low agreeableness, is related to intolerance of more competitive groups (e.g., low status, immigrants; Asbock, Sibley, & Duckitt, 2010; Sibley & Duckitt, 2008). It is also possible that agreeableness will be moderated by the ideology of the target group, consistent with the finding that social dominance orientation predicts greater intolerance of left-leaning social groups, but greater tolerance of right-leaning social groups (Chambers et al., 2013). In short, when judging whether individual difference variables are associated with tolerance or intolerance, it is first necessary to test the effects of personality

across a range of target groups and beyond the dangerous, derogated, and dissident groups studied in the past (Asbock et al., 2010). Without these tests it will not be possible to determine the extent of both the significant and the null effects of personality on prejudice found in the literature. Our research should serve as a caution to researchers when making conclusions about individual differences as they relate to intolerance only toward one particular set of target groups.

Just as the four studies reported in this paper suggest that there are limitations to research following the individual differences perspective, these studies also suggest that there are limitations to a strong version of the worldview conflict perspective. Worldview conflict is a powerful predictor of intolerance, a finding consistent across many different labs, targets, and empirical paradigms (Chambers & Melnyk, 2006; Crawford & Pilanski, 2014; Henry & Reyna, 2007; Skitka, Bauman, & Sargis, 2005), including our Studies 3 and 4. However, the studies we conducted suggest that not all worldview conflicts are equally likely to lead to mirror-image levels of intolerance in which each side appears equally intolerant of the other side. In Study 3, people high in openness perceived more worldview conflict for conventional groups than unconventional groups and this worldview conflict predicted intolerance, consistent with the worldview conflict perspective. At the same time, people high in openness also did not always show clear instances where intolerance towards conventional groups was higher than intolerance towards unconventional groups (Studies 1-3), which is consistent with the idea that openness to experience does mitigate intolerance of diverse experiences in the majority of cases. Additional work is needed to determine when the individual difference, the worldview conflict, or the integrative perspective is likely to provide the best explanation for the relation between individual difference variables and intolerance.

Limitations

There are limitations to the current studies that should be addressed in future research. First, we focused on a relatively limited set of intolerance measures to maintain consistency across our studies. Because we needed to test these effects across many diverse target groups, it was necessary to use very brief measures of intolerance. Different types of measures could potentially produce different results. For example, people high in openness may differ in their willingness to express more extreme forms of intolerance towards worldview conflicting groups, such as political intolerance, violence, or non-normative collective action (Marcus, Sullivan, Theiss-Morse, & Wood, 1995; Tausch, Becker, Spears, Oliver, Saab, Singh, & Siddiqui, 2011).

Another limitation is that our designs are cross-sectional, and although we did manipulate conventionality within-participants, we could not manipulate openness. A longitudinal investigation would provide a more definitive test of our assumption that openness, in part, causes expressions of intolerance, but that the direction and precise trajectory of this causal effect differs for people low and high in openness depending on the target's conventionality. This assumption is consistent with the assumptions of previous work on the links between openness and various forms of intolerance (e.g., Flynn, 2005; Sibley & Duckitt, 2008) and with longitudinal studies demonstrating that openness predicts right-wing authoritarianism (Perry & Sibley, 2012), which in turn predicts prejudice towards unconventional groups (Asbrock, Sibley, & Duckitt, 2010).

We find that worldview conflict is a common process underlying intolerance for both people high and low in openness, with Study 3 even finding that this association is strong among people high in openness. At the same time, we some find evidence (with the exception of Study 4) that people low in openness have larger differences between conventional and unconventional

groups compare to people high in openness and suggest that this is due to the tolerance- and intolerance-related processes associated with low and high of openness. However, we do not have direct evidence for these additional processes, nor is it clear what exactly these processes are. Future work is necessary to delineate the processes, beyond worldview conflict, that might produce intolerance and tolerance along the openness continuum.

One possibility is that research that focuses at a lower-level of analysis could find important differences in how people high and low in openness make tolerance judgments. One possibility, building off of work related to the need for closure (Perry & Sibley, 2013), is that people low in openness will be more likely to seize and freeze on their intolerance judgments. People high in openness, however, may be more flexible in their opinions and be more likely to update their opinions when presented with new evidence about the similarity or dissimilarity of a target group. That said, recent work finds that political liberals and conservatives do not differ in their responses to general anchoring tasks (which also require updating initial judgments; Brandt, Evans, & Crawford, 2015) indicating that, perhaps, people high and low in openness also do not differ in general updating processes; this remains to be tested.

Conclusion

Understanding the underpinnings of prejudice and intolerance has been a primary goal for social and personality psychologists since the inception of our fields. An important contribution to this end has been the investigation of individual difference variables that predispose people toward greater levels of intolerance. One of the most robust of these has been openness to experience. In the literature, low openness has been consistently associated with greater levels of intolerance (and high openness with greater levels of tolerance) especially toward unconventional groups like racial/ethnic minorities, gays and lesbians, atheists, and so on. At

first blush it appears that openness to experience may buffer people against the perceived threats often associated with outgroups. However, this literature has to date been incomplete: by not including conventional groups in this analysis, we have missed the instances when those low in openness might be more tolerant and even instances where high openness predicts intolerance.

The present research rectifies this omission by testing the openness-tolerance relationship across a variety of groups that differ in their degree of conventionalism. We show that the perceived conventionality of social groups is an important and consistent moderator of the association between openness to experience and intolerance. Our findings highlight the need to consider how individual difference variables *and* features of the target groups may interact in important ways to influence the expression of prejudice. To understand how individual differences, from personalities to worldviews, influence the expression of tolerance and intolerance it is necessary to examine multiple target groups that can allow both tolerance and intolerance to emerge.

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Table 1

Mean Conventionality Scores (from Study 3) and Correlations between Openness and Intolerance for each Target Group in Studies 1 & 2

	Study 1		Study 2
Tolerance dependent measure and Target group:	Mean Conventionality Scores	Intolerance *r*	Intolerance *r*
Feeling Thermometer ratings for:			
Atheists	2.87		-.10**
Gays and Lesbians	2.91		-.18**
Feminists	3.04		-.14**
Poor People	3.87		-.09**
Muslims	3.94	-.15**	-.12**
Tea Party Members	4.14		.12**
Blacks	4.18	-.10**	-.13**
Labor Unions	4.24		-.09**
Hispanics	4.33	-.12**	-.15**
Asian-Americans	4.62		-.13**
Rich People	4.80		-.03*
Christian Fundamentalists	4.90		.11**
Big Business	5.02		.03*
Whites	5.24	.02	-.06**
Military Personnel	5.26		.03*
Catholics	5.2		.02
N Range		1075–1206	5294–5480
Willingness to Vote ratings for:			
Person with no religion	2.87	-.09**	
Gay or Lesbian	2.91	-.13**	
Muslim	3.94	-.06*	
Black	4.18	-.07*	
Hispanic	4.33	-.08**	
Jew	4.67	-.03	
Woman	4.74	-.11**	
Evangelical or “Born Again” Christian	4.90	.15**	
Catholic	5.28	.05+	
N Range		1237–1236	

Note: Feeling thermometer ratings were coded so that higher scores indicated more dislike. Willingness to vote ratings were coded so that higher scores indicated less willingness to vote. Higher conventionality ratings indicate more conventionality. The mean conventionality score for Evangelical Christians (Study 3) was used for Christian Fundamentalists (Study 2). The mean conventionalism score for Latinos (Study 3) was used for Hispanics (Studies 1 & 2). The mean conventionality score for Business People (Study 3) was used for Big Business (Study 2). The

mean conventionality score for Atheists (Study 3) was used for Person with no religion (Study 1). Blank spaces in the Study 1 column indicate that those groups were not included in the Study 1 survey. Blank spaces in the Study 2 column indicate that these voting measures were not obtained in Study 2. +$p < .10$, *$p < .05$, **$p < .01$.

Table 2

Unstandardized Slopes (Standard Errors) of Conventionality, Openness to Experience, and Their Interaction Predicting Intolerance (Studies 1 & 2)

	Feeling Thermometers		Vote
	Study 1 (ICC = .36) *b(SE)*	Study 2 (ICC = .11) *b(SE)*	Study 1 (ICC = .13) *b(SE)*
Primary Predictors			
Openness	-.09 (.03)**	-.07 (.01)***	-.02 (.02)
Conventionalism	-.24 (.01)***	-.20 (.01)***	-.21 (.01)***
Openness*Conventionalism	**.19 (.04)*** **	**.23 (.02)*** **	**.22 (.05)*** **
Covariates			
Gender	-.04 (.01)***	-.03 (.003)***	-.01 (.01)
Race/Ethnicity	-.04 (.01)**	-.04 (.003)***	.03 (.01)***
Age	-.06 (.02)*	-.04 (.01)***	.01 (.01)
Income	-.04 (.03)	-.01 (.01)	.00 (.02)
Education	-.05 (.04)	-.01(.01)	-.07 (.02)**
Ideology	.06 (.02)***	.004 (.01)	.03 (.01)**
	N = 1228	N = 4722	N = 1235

Note: ICC = intraclass correlation coefficients; *$p < .05$, **$p < .01$, ***$p < .001$.

Table 3
Mean Conventionality and Correlations between Openness and Feeling Thermometer for Each Target Group (Study 3)

	Total Sample	Total Sample	Sample 1	Sample 2	Sample 3
	Mean Conventionality Rating	Feeling Thermometer *r*	Feeling Thermometer *r*	Feeling Thermometer *r*	Feeling Thermometer *r*
Atheists	2.87	-.10*	-.13	-.10	-.08
Gays and lesbians	2.91	-.22***	-.29***	-.17*	-.22***
Feminists	3.05	-.17***	-.04	-.21*	-.24***
Occupy Wall Street members	3.23	-.14***	-.09	-.03	-.19***
Young people	3.45	-.04	.09	.01	-.15**
People who favor legalized abortion	3.48	-.15***	-.17*	.01	-.19***
Environmentalists	3.56	-.28***	-.19**	-.23**	-.34***
Poor people	3.87	-.18***	-.13	-.09	-.24***
Muslims	3.95	-.14***	-.12	-.16	-.14*
Democrats	4.14	-.06	.08	-.01	-.15**
Tea Party members	4.15	.15***	.16*	-.01	.18***
Blacks	4.18	-.14***	-.09	-.16	-.16**
Labor unions	4.24	-.11**	-.09	.01	-.15**
Latinos	4.33	-.14***	-.11	-.13	-.18***
People who oppose legalized abortion	4.60	.15***	.20**	.02	.17**
Asian-Americans	4.62	-.13***	-.19**	-.07	-.13*
Jews	4.67	-.16***	-.19**	-.01	-.20***
Women	4.74	-.14***	-.04	-.13	-.20***
Rich people	4.81	.06	.3	.14	.04
Evangelical Christians	4.90	.10*	.11	-.03	.13*
Southerners	4.96	-.05	-.02	-.03	-.08
Business people	5.03	.06	.22**	.07	-.02
Men	5.03	-.06	.10	-.07	-.15**
Republicans	5.11	.16***	.05	.11	.23***
Whites	5.24	-.03	.01	-.03	-.08
Military personnel	5.26	.04	.04	.03	.04

Catholics	5.28	.03	.17*	-.01	-.04
Heterosexuals	5.31	-.04	-.03	-.004	-.07
Elderly people	5.48	-.11**	-.16*	-.09	-.11*
Supporters of the traditional family	5.78	.12***	.22***	.03	.10
N Range	638 - 686	601 - 682	180 – 219	101 - 142	314 - 326

Note: Higher scores indicate more conventionality, more negative feelings, and more openness. *$p < .05$, **$p < .01$, ***$p < .001$.

Table 4

Unstandardized Slopes (Standard Errors) of Conventionality, Openness to Experience, and Their Interaction Predicting Feeling Thermometer and Worldview Conflict (Study 3)

	Feeling Thermometer (ICC = .21) *b(SE)*	Worldview Conflict (ICC = .07) *b(SE)*
Primary Predictors		
Openness	-.10 (.04)**	.01 (.03)
Conventionalism	-.25 (.03)***	-.18 (.03)***
Openness*Conventionalism	**.67 (.11)*** **	**.69 (.14)*** **
Covariates		
Gender	.06 (.01)***	.03 (.01)***
Race/Ethnicity	-.01 (.01)	-.01 (.01)
Age	.03 (.03)	-.04 (.03)
Income	-.06 (.02)***	-.02 (.02)
Education	.05 (.03)	.00 (.03)
Ideology	-.01 (.03)	-.01 (.02)
Need for Cognitive Closure	-.05 (.06)	.02 (.05)
	N = 612	N = 608

Note: ICC = intraclass correlation coefficient. **$p < .01$, ***$p < .001$.

Table 5

Mean Conventionality Scores and Correlations between Openness and Intolerance for Each Target Group (Study 4)

	Conventionalism	Intolerance
	M	*r*
Gays and lesbians	2.49	-.34***
Atheists	2.76	-.27***
Poor people	3.92	-.27***
Democrat	4.15	-.15**
Business people	4.95	.06
Evangelical Christians	5.33	.16***
Republican	5.44	.22***
Supporters of the traditional family	5.89	.19***
N Range	450-453	445-450

Note: Conventionalism was recoded to range from 0 to 1 for the multilevel analyses. **$p < .01$, ***$p < .001$.

Table 6

Items Assessing Worldview Conflict-Related Mediators (Study 4)

Symbolic Threat (*r* range .69 - .87, *M r* = .80)

- To what extent do you think the following groups violate your core values and beliefs?
- To what extent do you think the following groups reject moral values that are important to you?

Rights Threat (*r* range .81 - .92, *M r* = .88)

- To what extent do you think the following groups restrict the personal rights of people like you?
- To what extent do you think the following groups limit the personal freedoms of people like you?

Resource Threat (*r* range .45 - .66, *M r* = .60)

- To what extent do you think the following groups take away societal resources from people like you?
- To what extent do you think the following groups hold too many positions of power and responsibility in our society?

Safety Threat (*r* range .68 - .75, *M r* = .72)

- To what extent do you think the following groups make our society less safe and more dangerous?
- To what extent do you think the following groups endanger the physical safety of people like you?

Note: Each item measured on a seven-point scale (1 = *not at all*, 7 = *to a great extent*) and each scale was recoded to range from 0 to 1 for analysis.

Table 7

Unstandardized Slopes (Standard Errors) of Conventionality, Openness to Experience, and Their Interaction Predicting Intolerance, Threats, and Excitement (Study 4)

	Intolerance (ICC = .11) *b(SE)*	Symbolic Threat (ICC = .13) *b(SE)*	Rights Threat (ICC = .18) *b(SE)*
Primary Predictors			
Openness	-.06 (.04)	-.01 (.06)	.09 (.06)
Conventionalism	-.07 (.04)	-.07 (.05)	.13 (.04)**
Openness*Conventionalism	**1.24 (.17)*** **	**1.47 (.21)*** **	**1.26 (.18)*** **
Covariates			
Gender	.02 (.01)	.01 (.02)	.02 (.02)
Race/Ethnicity	-.03(.02)	.04 (.02)	.04 (.02)
Age	-.03 (.03)	.02 (.04)	-.04 (.05)
Income	-.02 (.02)	-.05 (.03)	-.07 (.04)*
Education	-.02 (.03)	.08 (.05)	.06 (.05)
Ideology	-.002 (.03)	.06 (.04)	-.02 (.04)
	N = 440	N = 441	N = 441
	Resource Threat (ICC = .15) *b(SE)*	Safety Threat (ICC = .34) *b(SE)*	Excitement (ICC = .19) *b(SE)*
Primary Predictors			
Openness	.09 (.06)	.08 (.06)	.01 (.05)
Conventionalism	.13 (.04)***	-.01 (.03)	-.06 (.04)
Openness*Conventionalism	**1.20 (.16)*** **	**.95 (.15)*** **	**-1.08 (.17)*** **
Covariates			
Gender	.02 (.02)	.03 (.02)	-.04 (.01)*
Race/Ethnicity	.02 (.02)	-.01 (.02)	-.01 (.02)
Age	-.05 (.04)	-.02 (.04)	-.06 (.04)
Income	-.04 (.04)	-.03 (.04)	-.01 (.03)
Education	.02 (.04)	-.01 (.05)	-.02 (.04)
Ideology	-.04(.04)	-.01 (.04)	.03 (.04)
	N = 440	N = 439	N = 441

Note: ICC = intraclass correlation coefficient; *$p < .05$, **$p < .01$, ***$p < .001$.

Table 8

Indirect Effect Estimates for People High and Low in Openness (Study 4)

	Indirect Effect	*SE*	*p*-value
High Openness			
Symbolic Threat	.11	.02	<.001
Rights Threat	.04	.01	<.001
Resource Threat	.02	.01	.01
Safety Threat	.04	.01	<.001
Excitement	.08	.01	<.001
Low Openness			
Symbolic Threat	-.15	.03	<.001
Rights Threat	-.01	.01	.09
Resource Threat	-.01	.005	.12
Safety Threat	-.04	.01	.001
Excitement	-.13	.02	<.001

Figure 1

Possible Patterns of Data Consistent with the Individual Differences (Panels A & B), Worldview Conflict (Panel C), and Integrative (Panel D) Perspectives

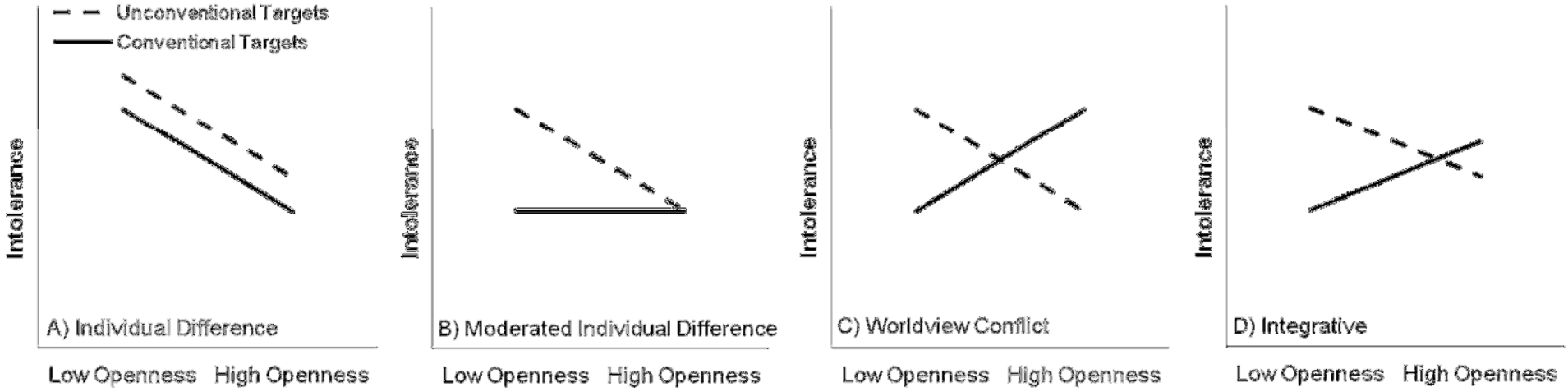
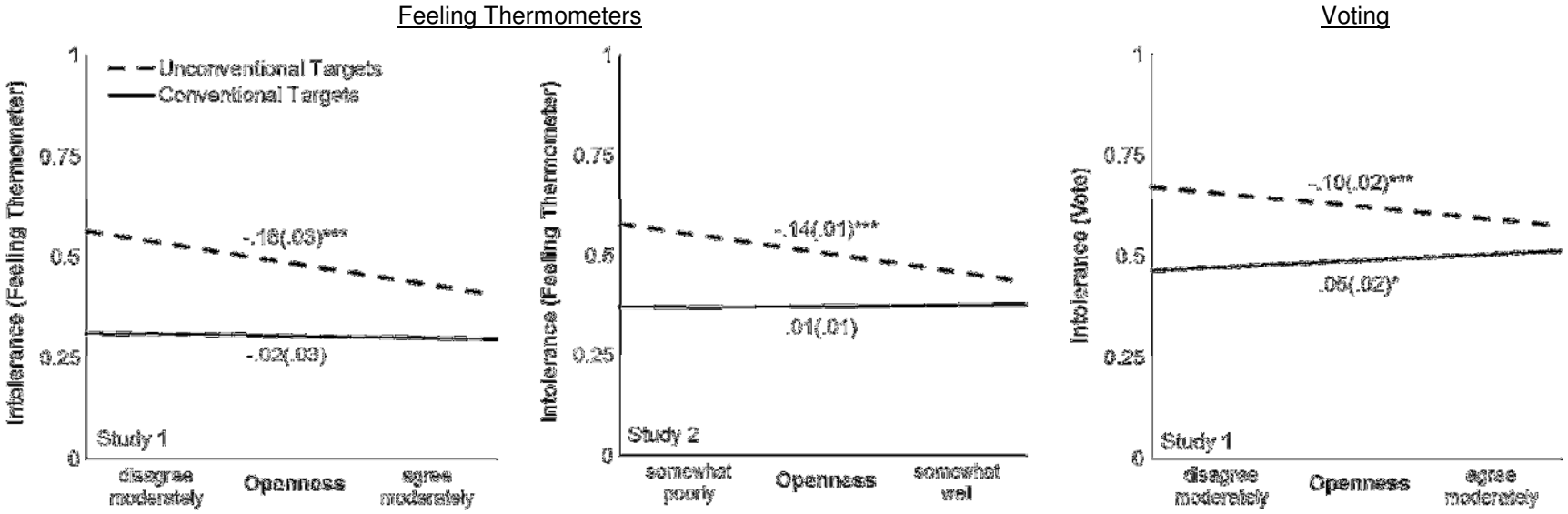


Figure 2

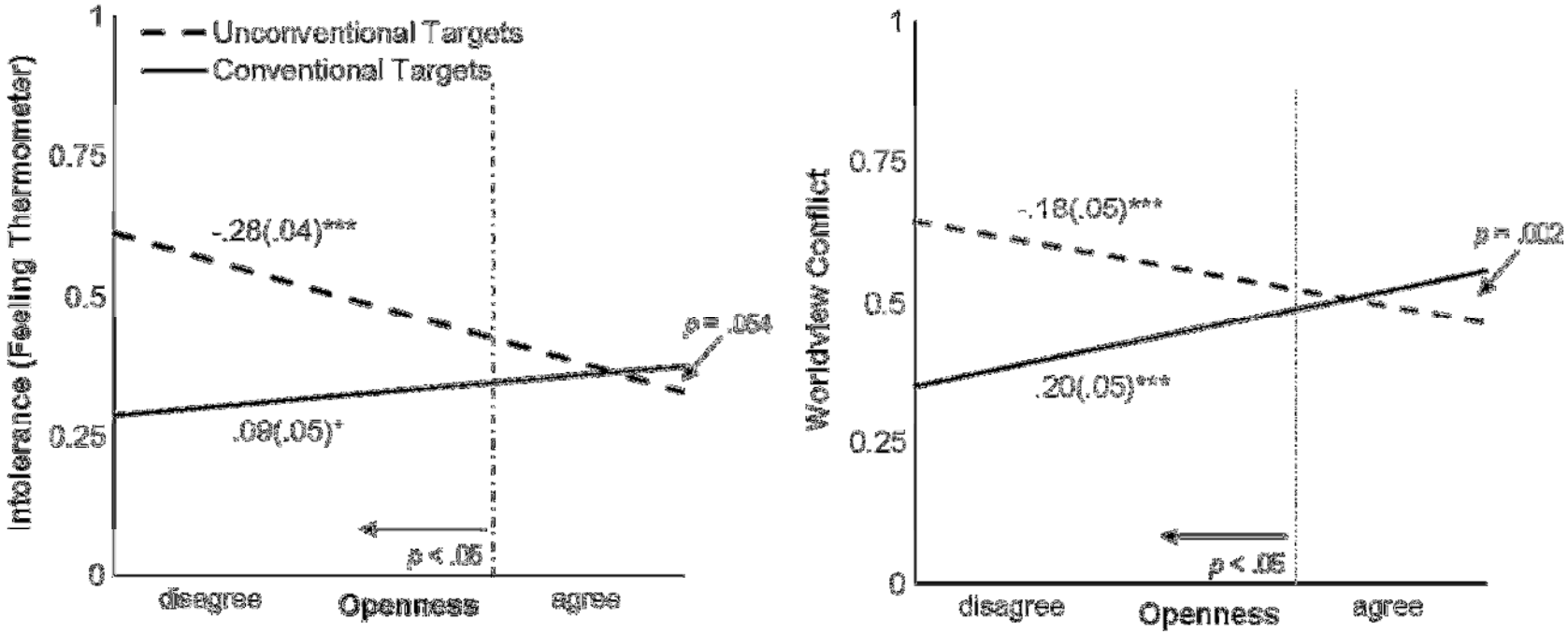
Interaction between Openness to Experience and Target Conventionality Predicting Two Measures of Intolerance (Studies 1 & 2)



Note: Higher scores indicate more negative feelings, less willingness to vote, and more openness. Slopes are unstandardized estimates with standard errors in parentheses. Simple slopes of conventionalism were probed at each point of the seven-point scale. All comparisons were significant. *$p < .05$, ***$p < .001$.

Figure 3

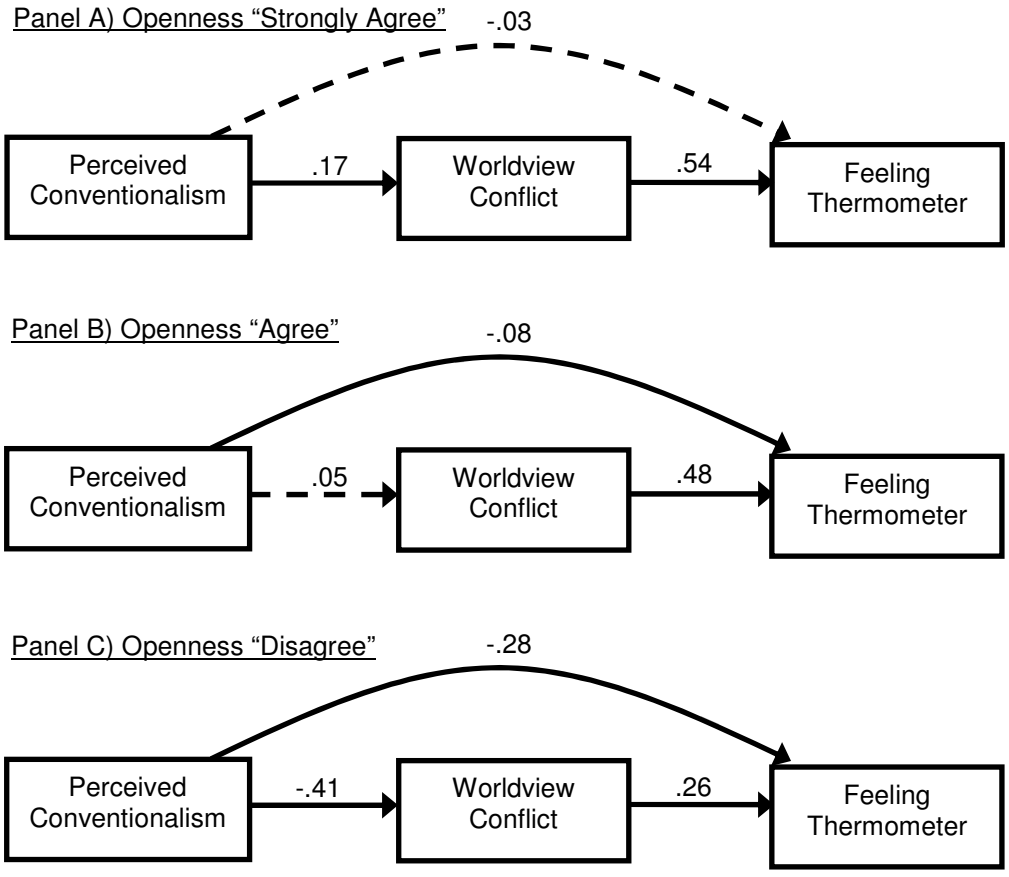
Interaction Between Openness to Experience and Target Conventionality Predicting Intolerance and Worldview Conflict in the Total Sample (Study 3)



Note: Higher scores indicate more negative feelings, more openness, and more worldview conflict. Slopes are unstandardized estimates with standard errors in parentheses. Simple slopes of conventionalism were probed at each point of the seven-point scale. Vertical lines indicate the first point in which the slope of conventionalism was significant. $^{+}p = .09$, $^{***}p < .001$.

Figure 4

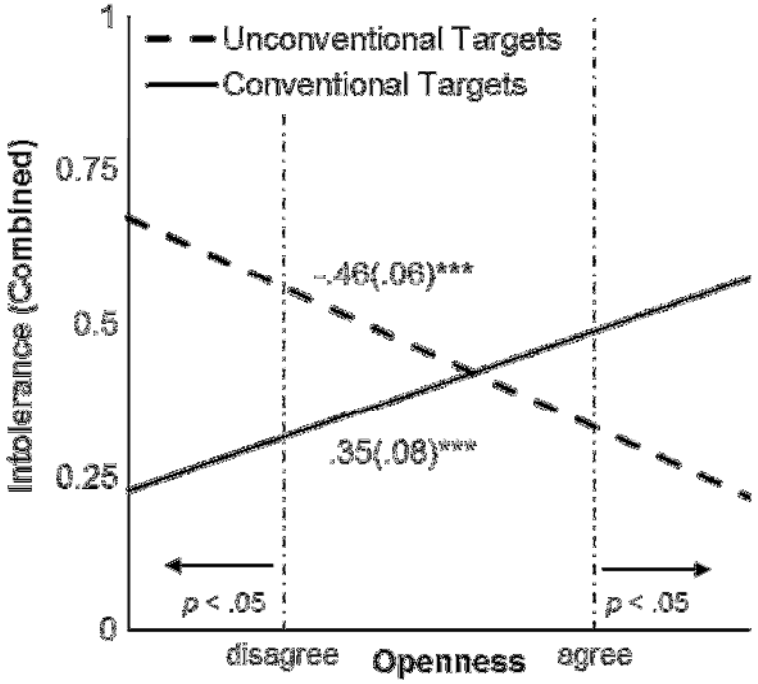
Mediation Model Results for People at Varying Levels of Openness (Study 3)



Note: Path estimates are unstandardized estimates. Dashed lines highlight paths where $p > .05$. All other p's <.001. N = 607.

Figure 5

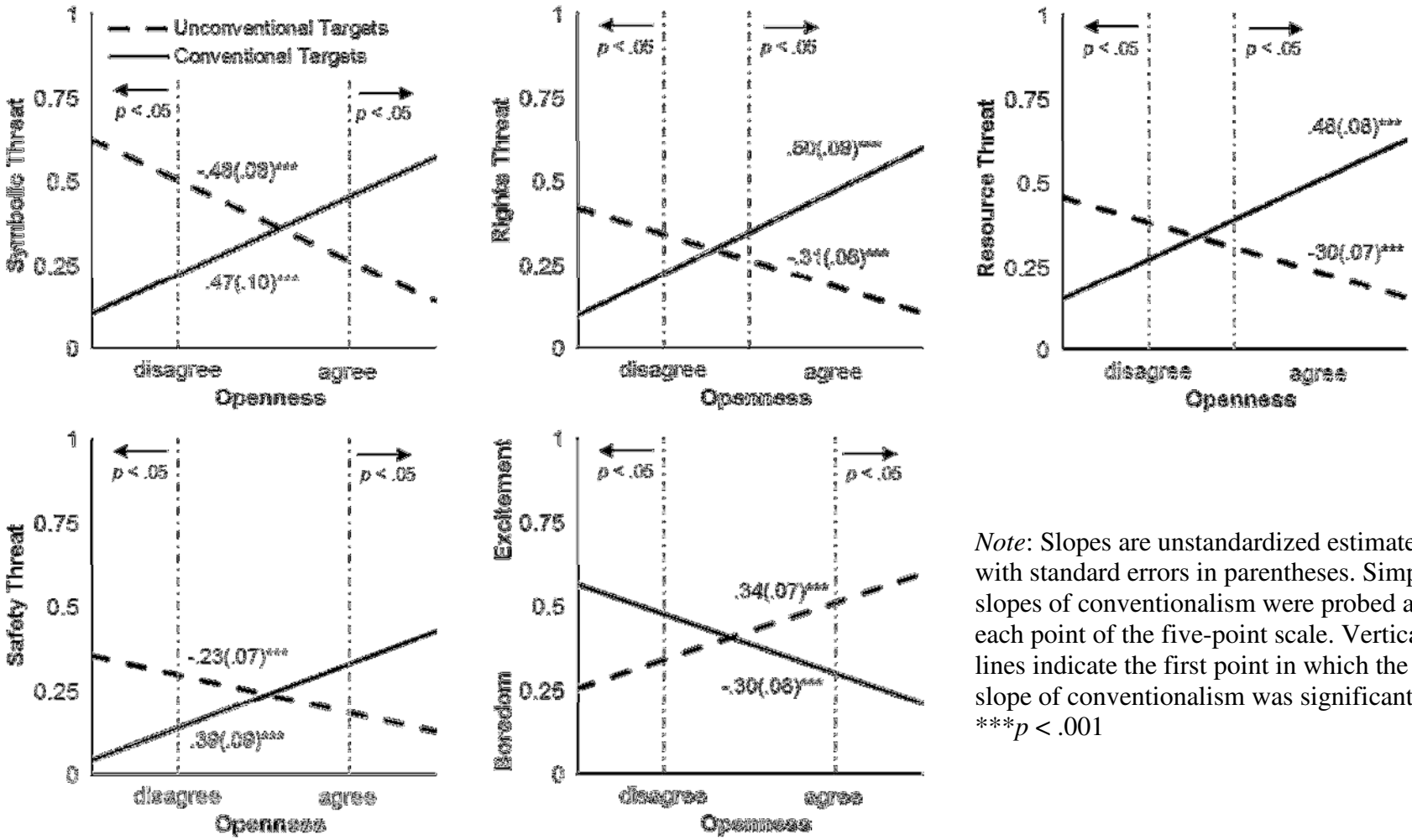
Interaction Between Openness to Experience and Target Conventionality Predicting Intolerance (Study 4)



Note: Slopes are unstandardized estimates with standard errors in parentheses. Simple slopes of conventionalism were probed at each point of the five-point scale. Vertical lines indicate the first point in which the slope of conventionalism was significant. ***$p < .001$

Figure 6

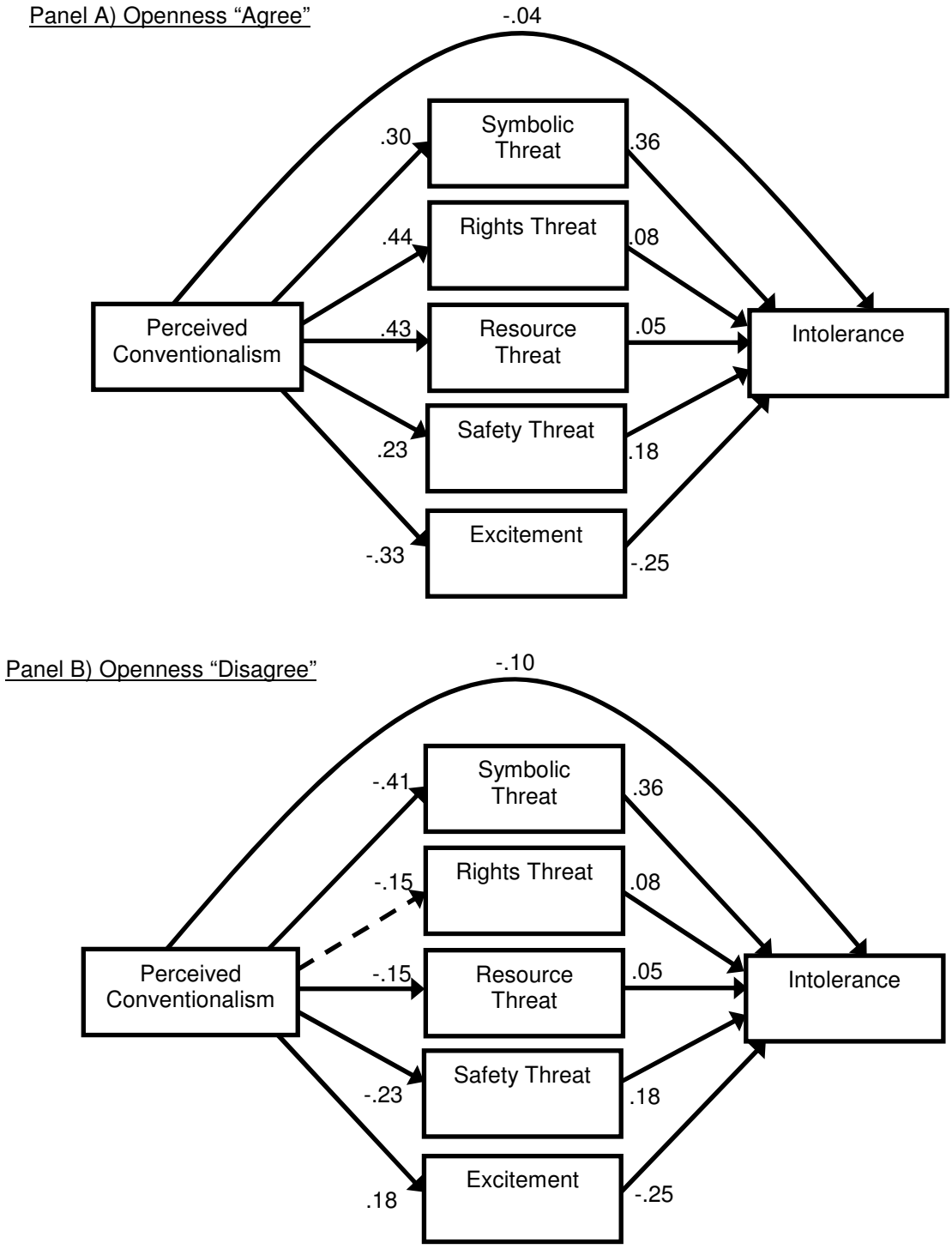
Interaction Between Openness to Experience and Target Conventionality Predicting Five Possible Mediators (Study 4)



Note: Slopes are unstandardized estimates with standard errors in parentheses. Simple slopes of conventionalism were probed at each point of the five-point scale. Vertical lines indicate the first point in which the slope of conventionalism was significant. ***$p < .001$

Figure 7

Multiple Mediation Model Results for People at Varying Levels of Openness (Study 4)



Note: Path estimates are unstandardized estimates. Solid paths *p*'s <.05. Dashed path *p* = .051. N = 437.

Footnotes

[1] Stereotypes, prejudice, and discrimination are interrelated constructs representing cognition, affect, and behaviors directed at social groups, respectively. Because the measures in our studies and the studies that we are building on reflect a combination of stereotypes, prejudice, and discrimination, we opt for the terms "intolerance" or "tolerance" as all-encompassing terms for negative beliefs, behaviors, and feelings towards a group or an individual from a group based on their membership in that group (cf. Crandall, Eshleman, & O'Brien, 2002 for a similar definition of prejudice specifically).

[2] A group's conventionalism is, to some degree, defined relative to other groups with which it compared and judged (e.g., Business people may not seem conventional compared to Christian fundamentalists, but they are in comparison to feminists).

[3] Some research on the openness-tolerance association seems to include measures of attitudes toward groups likely to be more conventional. For example, the meta-analysis by Sibley and Duckitt (2008) used measures of sexism—or prejudice against women. Women are not necessarily unconventional; however, their measure of sexism (modern sexism) was targeted at women who do not uphold society's conventional gender roles (Ekehammar, Akrami, & Araya, 2000; Swim, Aikin, Hall, & Hunter, 1995), and so is better conceptualized as a measure of prejudice against unconventional women.

[4] Additional details about study design and sampling methodology for Studies 1 and 2 are available at http://www.electionstudies.org/studypages/2010_2012EGSS/2010_2012EGSS.htm and http://www.electionstudies.org/studypages/anes_timeseries_2012/anes_timeseries_2012.htm, respectively

[5] Across all four studies, conclusions are similar when covariates are excluded from the analysis.

[6] We included the 10 items from the HEXACO; however, one item specifically references liking for people with unconventional views (i.e. "I like people who have unconventional views."). This item is tautological with our measure of conventionalism and intolerance and so we did not include it in our analyses. In Study 4, we excluded it entirely from the study materials.

[7] We did not include the item "I like people who have unconventional views" in the study because of content overlap (see Footnote 6).