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The Role of Dialecticism in Objective and Subjective Attitudinal Ambivalence

Andrew Luttrell

Ball State University

Richard E. Petty

Ohio State University

Jen-Ho Chang

Academicia Sinica

LaCount J. Togans

Miami University

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Abstract

Although attitudes are often considered positive or negative evaluations, people often have both positive and negative associations with a target object or issue, and when people are ambivalent, they are typically presumed to find the experience aversive because they are motivated to hold clear, univalent attitudes. Cross-cultural research, however, has shown cultural variation in the propensity for dialectical thinking, which is characterized by a tolerance for contradiction. Two studies examined the role of dialectical thinking tendencies in the occurrence of attitudinal ambivalence and how much people subjectively experience their state of ambivalence. Study 1 measured individual differences in dialectical thinking within a culture, and Study 2 compared participants across two cultures (United States and Taiwan) that differ in dialecticism. Across studies, dialectical thinking was increasingly associated with holding both positive and negative evaluations of the same topic ("objective ambivalence") and weaker correlations between objective ambivalence and subjective reports of being conflicted ("subjective ambivalence").

Keywords: ambivalence, dialecticism, cross-cultural psychology, attitude strength

The Role of Dialecticism in Objective and Subjective Attitudinal Ambivalence

That people strive for cognitive consistency has been a hallmark of social psychology for decades (Abelson et al., 1968; Gawronski & Strack, 2012). It seems, though, that such motivations for consistent cognitions apply especially well to the Western samples upon which much research has focused; research in other cultures (namely, East Asian cultures) shows less support for an inherent aversion to inconsistency (Spencer-Rodgers, Williams, et al., 2010). We extend these insights to people's attitudes, a fundamental area of social psychology and one that also often assumes that people are motivated to establish clear, coherent evaluations (Dalege et al., 2018). Specifically, we examine individual and cross-cultural variation in how much people hold attitudes comprised of mixed positive and negative reactions and subjectively experience that conflict.

Ambivalence

Ambivalent attitudes consist of both positive and negative reactions (Kaplan, 1972; Thompson et al., 1995) and have often been discussed at two levels: "objective" and "subjective" (Priester & Petty, 1996). Objective ambivalence (OA) is the degree to which people report both positive and negative evaluations of an object; it is simply how much people actually have mixed reactions. Subjective ambivalence (SA), by contrast, is feeling mixed and conflicted about the attitude object.

Both types of ambivalence (objective and subjective) tend to predict an attitude's strength: more ambivalent attitudes are typically more susceptible to persuasion (Armitage & Conner, 2000; Visser & Mirabile, 2004), more unstable over time (Craig et al., 2005; Luttrell, Petty, et al., 2016; Luttrell et al., 2020), and weaker predictors of behavior (Conner et al., 2002, 2003). At least some of these effects stem from the unpleasantness that accompanies mixed

attitudes. According to a dominant perspective on ambivalence, holding both positive and negative evaluations of the same target is typically experienced as problematic, often presenting a negative affective state that people are motivated to reduce (Priester & Petty, 1996; van Harreveld, van der Pligt, et al., 2009). Indeed, people with ambivalent attitudes engage more with relevant information to resolve their cognitive inconsistency (Jonas et al., 1997; Maio et al., 1996; Nordgren et al., 2006; Sawicki et al., 2013).

Importantly, objective and subjective ambivalence are not isomorphic. For example, having both positive and negative reactions to an object does not always evoke SA. Even at the same level of OA, SA can be heightened or attenuated depending on other features of the attitude or context in question, such as whether other people agree with one's opinion or not (Priester & Petty, 2001; see also DeMarree et al., 2014; Newby-Clark et al., 2002; Snyder & Tormala, 2017; Tormala & DeSensi, 2008; van Harreveld, Rutjens, et al., 2009). In addition, however, we suggest that features of the perceiver also predict (a) the tendency for attitudes to be objectively ambivalent and (b) for such ambivalence to correspond with feeling mixed and conflicted.

Dialectical thinking

We propose that individual differences in *dialectical thinking* are associated with these consequences. This construct refers to a style of thinking that tolerates apparently contradictory information (Peng & Nisbett, 1999; Spencer-Rodgers, Williams, et al., 2010; Spencer-Rodgers et al., 2018). Past cross-cultural research demonstrated that East Asians tend to think more dialectically than Westerners do (Hamamura et al., 2008; Peng & Nisbett, 1999), but despite this general cultural difference, there is also within-culture variance in people's tendency to think dialectically, which also accounts for relevant outcomes (e.g., Cheng, 2009; Hideg & Ferris, 2017).

In an early demonstration of the effects of dialectical thinking, Peng and Nisbett (1999, Study 5) presented American and Chinese participants with pairs of scientific studies that had divergent results. When asked to rate the plausibility of these findings, Americans tended to clearly favor one as more plausible than the other, whereas Chinese respondents tended to see both findings as similarly plausible. Relatedly, some classic cognitive consistency effects, including cognitive dissonance (Heine & Lehman, 1997; cf. Hoshino-Browne, 2012), consistency-based compliance (Petrova et al., 2007), and the internal consistency of the self-concept (Choi & Choi, 2002) are attenuated for East Asian participants relative to Western participants. Given the relevance of attitudinal ambivalence to research on general cognitive consistency processes (Gawronski, 2012), we hypothesized that dialecticism—both as an individual and a cross-cultural difference—would play a role in the occurrence and consequence of attitudinal ambivalence.

The present research

We set out to test three hypotheses: people who think more dialectically will (1) report more OA, (2) have a reduced correlation between positive and negative reactions (indicating reduced evaluative consistency), and (3) show weaker correspondence between OA and SA.

First, we hypothesized that people who tend to think more dialectically would hold more objectively ambivalent attitudes. We are not suggesting that dialectical mindsets *necessarily* require people to hold ambivalent attitudes but rather that dialecticism predisposes people to more openly consider attitude-relevant information regardless of its valence. Thus, when the opportunity arises to see both positive and negative attributes of a stimulus, people who tend to think more dialectically are more likely to incorporate both types of attributes into their attitudes whereas people who tend to think less dialectically would put more weight on information of one

valence in the interest of forming an evaluatively coherent opinion. These processes suggest that dialecticism likely predicts holding more ambivalent attitudes, although this is unlikely a perfect relationship given other idiosyncratic predictors of ambivalence.

Some prior evidence supports our proposal that positive and negative valence are seen as less incompatible by people who think more dialectically. For instance, dialecticism is associated with complex emotional experiences; people who tend to think more dialectically report equally intense and frequent positive and negative emotional experiences (Hui et al., 2009; Spencer-Rodgers et al., 2004), and the frequencies of perceived pleasant and unpleasant emotions are less negatively correlated in countries where dialecticism is prevalent (Schimmack et al., 2002). East Asians and Asian Americans are also more likely than European Americans to endorse both positive and negative self-views (Boucher et al., 2009; Hamamura et al., 2008; Spencer-Rodgers et al., 2004).

Despite these suggestive findings on ratings of emotions and the self, dialecticism's effects have not been investigated with respect to naturally occurring attitudes other than self-evaluations and may not generalize to a broader set of objects. Although dialecticism is related to experiencing mixed emotions, emotions tend to be in-the-moment transient experiences whereas attitudes are more often construed as enduring evaluations stored in memory (e.g., Fazio, 1995). Therefore, at any given moment, although a dialectical thinking style might encourage someone to consider a variety of positive and negative information, they might nevertheless eventually settle on an overall attitude that is as univalent as for those with a non-dialectical style. In short, although there are theoretical reasons to expect a relationship between dialecticism and attitudinal ambivalence, the existing mixed emotions research cannot necessarily be taken as evidence of this more general phenomenon. Similarly, the work on self-ambivalence may be

restricted to evaluations of oneself specifically. Indeed, culture seems to act especially powerfully on self-construal (Markus & Kitayama, 2010). Thus, prior research on dialecticism and self-construal may not extend to more mundane attitudes. That is, when it comes to forming everyday opinions, a desire to settle on a coherent summary evaluation might hold across variations in dialecticism. This could be because holding coherent attitudes has functional value for everyone (Katz, 1960; Smith et al., 1956).

Finally, we note that results from an unpublished study hint at an effect of dialecticism on general attitudinal ambivalence, but several features of the study prevent strong conclusions. Hamamura (2004) presented participants with a questionnaire containing two questions each for 16 topics; one question measured positive associations with the topic and the other measured negative associations. As expected, Japanese and Asian Canadian participants were more likely to endorse both positive and negative items than were European Canadians. However, in contrast to common measures of attitudinal ambivalence that simply assess overall positivity and negativity separately, Hamamura (2004) utilized pairs of different belief statements that would have opposing evaluative implications. For example, one pair of opposing statements was: “It is hot now” and “If somebody came to this room right now, that person would probably think it’s cold.” With this approach, respondents could perceive some credibility in two opposing statements while also holding an unambivalent overall attitude that lies somewhere between the two extremes. In addition, most of the topics substantively differed between countries. For example, the Canadian version of one topic was severe wildfires while the Japanese version was earthquakes. As a result, any between-group differences in ambivalence may more simply reflect differences in public opinion about qualitatively distinct topics. Thus, although the results obtained by Hamamura (2004) are consistent with a relationship between dialecticism and

attitudinal ambivalence, the limitations of this research and the dearth of other research examining this hypothesis call for replication and a stronger test of dialecticism's relationship with attitudinal ambivalence.

Nevertheless, other research by Minkov (2009) offers suggestive evidence that dialecticism may indeed correspond with ambivalence for naturally occurring attitudes even when a standard set of survey items is used to assess those attitudes. Specifically, in countries characterized by more dialecticism, populations are relatively less polarized on various judgments. Rather than being composed of distinct contingents of the population with extreme and opposing views, individuals in more dialectical countries tend to offer more moderate responses on opinion surveys. Because more ambivalence tends to result in more neutral responses to bipolar attitude measures, the patterns that Minkov (2009) documents may in fact reflect the occurrence of more OA in more dialectical cultures.

Our research applied two general approaches to testing dialecticism's effect on OA. First, some prior dialecticism research has computed endorsement of discrepant responses on a person-by-person basis (e.g., Spencer-Rogers et al., 2004), which is a common approach in ambivalence research (Thompson et al., 1995). This approach emphasizes the degree of evaluative conflict at the level of an individual's own attitude. Other dialecticism research, however, has tested the correlations between positive and negative emotions (Spencer-Rodgers, Peng, et al., 2010), which emphasize the general consistency of these responses at a more macro level. Although these approaches are similar and are each presumed to relate to dialectical thinking, we examined both approaches here because they are nevertheless distinct—for example, two groups could show the same strong inverse correlation between positive and negative reactions but differ in

the degree to which individuals' attitudes contain highly conflicting reactions as assessed with common ambivalence measures.

Finally, we hypothesized that the correlation between OA and SA would be attenuated among people relatively high in dialecticism. That is, holding objectively mixed reactions would correspond less with the subjective experience of being mixed and conflicted for those high rather than low in dialecticism. Although we predict that dialecticism accounts for some variance in OA, situational opportunities can arise to put anyone in a position to endorse both positive and negative qualities of a stimulus. For someone who thinks less dialectically, grappling with these pros and cons are hypothesized to be unsettling because they are especially motivated to arrive at a single right answer (cf. van Harreveld et al., 2009). Therefore, for such people, OA is quite likely to evoke the subjective experience of being mixed and conflicted. But we hypothesized that someone who thinks dialectically should be able to more comfortably accommodate a complex attitude comprised of both positive and negative associations.

Recent research in consumer psychology provides evidence that is compatible with our hypothesis, showing that greater dialecticism produces less difficulty processing contradictory product reviews (DeMotta et al., 2016) and less discomfort when given mixed product information (Pang et al., 2017; Wang et al., 2016). Although these studies illustrate effects of dialecticism on ambivalence-related discomfort, none assess people's naturally held attitudes toward important topics. Instead, they examine attitudes toward novel, artificial stimuli developed for the purpose of the experiment (e.g., ratings of a fictitious movie; DeMotta et al., 2016). It is unclear whether these effects of dialectical thinking would also occur for attitudes that people already have and for which they may have already spent considerable time weighing the positives and negatives.

Critically, the existing studies mostly rely on experimental inductions to prime dialectical thinking rather than treating it as an individual difference. For example, DeMotta et al. (2016) had participants write for five minutes about the benefits of "taking the middle ground" and the importance of compromising and embracing everyone's opinions. Pang et al. (2017) had participants come up with reasons why two contradictory statements could both be plausible. Although such blatant procedures indeed instruct people to accept mixed-valence information, it is unclear whether natural variance in people's propensity to think dialectically have similar outcomes.

Additionally, the research on SA has not thoroughly examined cross-cultural differences. Indeed, we could locate only one study using cultural variation in dialecticism that is relevant to this hypothesis, showing cultural differences in the degree to which OA is psychologically problematic (Ng et al., 2012). For European Canadians, the more their initial attitudes toward an essay's topic were objectively ambivalent, the more persuaded they were by the essay itself, replicating past work (Armitage & Conner, 2000). For East Asian Canadians, however, OA was unrelated to persuasion outcomes. Although this research did not directly examine the impact of OA on SA (because SA was never assessed), the results are consistent with our hypothesis in that OA is typically associated with outcomes aimed at reducing the unpleasantness of felt conflict (e.g., openness to persuasion). If the relatively dialectical East Asian Canadian sample did not necessarily feel more conflicted at higher levels of ambivalence, as we predict, then increasing ambivalence would not necessarily correspond to more susceptibility to persuasion.

Study 1

As a first test of our hypotheses, we examined relationships between individual differences in the tendency to think dialectically and attitudinal ambivalence, both objective and

subjective. To bolster our ability to generalize across attitude objects, we measured responses from two samples of participants, each of which evaluated four or five different topics.[1]

Method

Participants. Data were collected from two samples, and responses were analyzed jointly.[2] Sample A comprised 104 undergraduate students at Ohio State University (M_{age} = 19.53, *SD* = 1.42; 50% female), and Sample B comprised 170 undergraduate students at Ball State University (M_{age} = 19.49, *SD* = 2.07; 65% female). Each sample came from a mid-large university in the midwestern United States. In each case, participants enrolled in the study and completed the survey online in partial fulfilment of a course requirement. They could take as much or as little time as they wanted to complete the survey and could participate from any location they wished. The survey recorded how long participants took to complete the study, and we noticed that several participants spent an excessive amount of time logged into the survey, raising doubts about their degree of attention. To focus analyses on participants most likely to have attended to the stimuli, we excluded several people who kept the survey open for an extremely long time. Values were highly skewed (skewness = 8.58), so we followed recommended practice (Iglewicz & Hoaglin, 1993; Leys et al., 2013) and computed median-based modified Z-scores for survey completion times and excluded 26 cases with modified Z-scores above 3.5 (i.e., spending more than 56 minutes on the survey), leaving a final sample size of *N* = 248. All effects remain significant, however, with the full sample.

[1] Materials, data and analysis scripts for all studies can be found at https://osf.io/rz38y/. All measures (including ancillary measures not analyzed for this article's central questions) are presented in the online supplement. For both studies, we report all relevant measures, manipulations, and exclusions.

[2] None of the effects of dialecticism were moderated by sample (*p*s > .10); see the online supplement for results individually by sample.

This sample size provided 80% power to detect correlations between dialecticism and OA as small as $r = .18$ and to detect interactions between measured variables as small as $f^2 = .03$, if we had assessed attitudes toward only one topic. The actual design of the study is a bit more complex, however, so we also conducted simulation-based power analyses using the observed mixed-effects model results to further understand this study's power in the context of its full design without having *a priori* expectations about all model parameters. Although post-hoc power analyses should be interpreted with caution (Hoenig & Heisey, 2001), the three focal effects we report were significant at least 87% of the time in 500 simulations. See the online supplement for details about these analyses and further sensitivity analyses.

Procedure. Participants reported OA and SA about several topics. Sample A responded to "death penalty," "libraries," "nuclear power," and "recycling." Sample B responded to "gambling," "gun control," "immigration reform," "organic food," and "police officers." We selected these topics expecting them to produce variance in ambivalence while also reflecting a range of different issues and objects. The procedure and measurement instruments were identical for each sample. Respondents saw a series of four computer screens, each of which presented one of the topics in bold at the top of the screen. Survey questions to assess attitude attributes were presented below each topic, and participants provided all responses for one topic before moving onto the next. Topics were presented in a random order. Finally, all participants responded to the Dialectical Self Scale. Full question wordings for all measures in both studies are available in the online supplement.

Measures.

***Ambivalence*.** To assess OA, participants separately reported their overall positive and negative reactions to each topic, using items adapted from prior research (Priester & Petty, 1996;

Refling et al., 2013). Specifically, participants were asked: "Ignoring the positives, to what extent do you have NEGATIVE thoughts or feelings about this?" and "Ignoring the negatives, to what extent do you have POSITIVE thoughts or feelings about this?" Responses were provided on scales from 1 ("No [negative/positive] thoughts or feelings") to 11 ("Maximum [negative/positive] thoughts or feelings"). These scales were used to create an index of OA using an established formula: (POS + NEG) / 2 – |POS – NEG|, where "POS" and "NEG" indicate responses to each single-valence measure (Thompson et al., 1995). Higher values on this index reflect greater degrees of OA.

To assess SA, we used established measures asking respondents the extent to which they felt "conflicted," "indecision," and "mixed" about the topic, using 11-point response scales (Priester & Petty, 1996). These items showed good internal reliability for each topic (αs $\geq$ .81), so they were averaged to form indices of SA for each topic. See Table 1 for summary statistics.

Other Attitude Strength Indicators. We measured two other common attitude attributes often studied in a similar fashion to ambivalence: certainty and importance (see Sawicki & Luttrell, 2020). Each were measured on 11-point scales anchored at "extremely uncertain" and "not at all important" on the low end and "extremely certain" and "extremely important" on the high end.

Dialectical Self Scale. Individual differences in tendencies to think dialectically were measured with the Dialectical Self Scale (DSS; Spencer-Rodgers et al., 2004), a 32-item scale with questions like "When I hear two sides of an argument, I often agree with both" and "I often find that things will contradict each other" (1 = Strongly disagree; 7 = Strongly agree).[3]

[3] Although Spencer-Rodgers et al. (2018) have noted that "the DSS was designed to assess dialectical *self-conceptions*…and should not be construed as a general measure of dialectical thinking" (emphasis in original), many items in the scale, such as the ones we quote in the text, appear to have face validity as a general measurement instrument. Although our effects might be even stronger if we had constructed a new attitude-specific scale, the

Responses were appropriately reverse scored and averaged to form an index of dialecticism for each participant (α = .81; M = 3.78, SD = .53).

Results and Discussion

Because the same sets of participants gave ratings for multiple topics, we analyzed these data using linear mixed-effects models, treating participant and topic as random intercepts. Analyses were conducted using the *R* packages, *lme4* (Bates et al., 2015) and *lmerTest* (Kuznetsova et al., 2017), which conducts t-tests using Satterthwaite approximations for degrees of freedom. Reported results are the fixed effects. Also, to account for variation in attitude attributes across topics, we mean-centered Level 1 predictors within topic; however, all results still hold when using uncentered predictors (see online analysis report for results with uncentered variables).

First, we entered dialecticism as a predictor of OA. Across topics, the more people reported a tendency to think dialectically, the more they reported attitudes characterized by ambivalence, γ = .99, t(243.2) = 4.11, p < .001, 95% CI: [.52, 1.46]. As an alternative test of this hypothesis, there is a significant correlation between dialecticism and average OA across all objects, r = .26, p < .001 (see Table 2).

Next, we tested whether dialecticism moderated the correlation between positive and negative ratings of each topic. Indeed, we found a significant negative rating × dialecticism interaction on positive ratings, γ = .15, t(1046.3) = 3.29, p = .001, 95% CI: [.06, .23] (Figure 1). Negativity and positivity were less negatively correlated for people with relatively high dialecticism (1 *SD* above the mean), γ = -.41, t(1050.4) = -11.69, p < .001, 95% CI: [-.48, -.34], than for people with relatively low dialecticism (1 *SD* below the mean), γ = -.57, t(1071.7) = -

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results we obtain with the original DSS suggest that this scale can indeed capture more general forms of dialectical thinking.

16.11, $p < .001$, 95% CI: [-.64, -.50]. These results suggest that individuals who think less dialectically view positives and negatives as being more in opposition of one another.

We also tested whether dialecticism moderated OA-SA correspondence. Results revealed a significant dialecticism × OA interaction on SA, $\gamma = -.10$, $t(1118.6) = -3.08$, $p = .002$, 95% CI: [-.17, -.04] (Figure 2). OA and SA were more strongly correlated for people relatively low in dialecticism (1 *SD* below the mean), $\gamma = .43$, $t(1119.7) = 16.82$, $p < .001$, 95% CI: [.38, .48], than for people relatively high in dialecticism (1 *SD* above the mean), $\gamma = .32$, $t(1111.2) = 13.34$, $p < .001$, 95% CI: [.27, .37].

Subsequent analyses tested how robust these effects were when controlling for related attitude attributes, namely certainty and importance. First, we added certainty and importance as predictors in our first model, and dialecticism remained a significant predictor of OA, $\gamma = .62$, $t(246.9) = 2.65$, $p = .009$, 95% CI: [.16, 1.08]. Consistent with prior research, certainty was negatively related to OA, $\gamma = -.50$, $t(1116.5) = -12.78$, $p < .001$, 95% CI: [-.58, -.42], as was importance, $\gamma = -.10$, $t(1122.5) = -2.86$, $p = .004$, 95% CI: [-.17, -.03]. Second, when entering these two variables as covariates, the dialecticism × OA interaction on SA remained significant, $\gamma = -.09$, $t(1119.1) = -2.76$, $p = .006$, 95% CI: [-.15, -.03]. Also consistent with prior research, certainty was negatively related to SA, $\gamma = -.30$, $t(1123.5) = -11.59$, $p < .001$, 95% CI: [-.35, -.25]. Interestingly, after controlling for all other variables, importance showed a small positive association with SA, $\gamma = .05$, $t(1114.5) = 2.27$, $p = .02$, 95% CI: [.01, .09].

Study 2

Study 1 established that individual variation in dialecticism is associated with the tendency to hold ambivalent attitudes and moderates how much people subjectively perceive a conflict when they hold ambivalent attitudes. To extend these findings to a true cross-cultural

design, we recruited participants from two locations shown by prior research to differ in dialectical thinking tendencies: the United States and Taiwan. We hypothesized that because they tend to think more dialectically, participants in Taiwan would hold more objectively ambivalent attitudes, show a reduced correlation between positivity and negativity, and show a weaker correlation between OA and SA, compared to their U.S. counterparts.

Method

Participants. We recruited 230 undergraduate students at Ohio State University in the U.S (M_{age} = 18.83, *SD* = 1.41; 52% female) and 290 undergraduate students at National Taiwan University in Taiwan (M_{age} = 20.19, *SD* = 1.72; 64% female) who participated in the study for course credit. Given the difficulties coordinating cross-cultural data collection, our aim was to maximize the sample size in each location under typical time and resource constraints. Our sample size provided 80% power to detect between-country differences as small as *d* = .25. Also, see the online supplement for simulation-based power analyses based on the results of Study 1. These additional analyses further support this sample size's power to detect the hypothesized effects.

Procedure. Participants reported OA, SA, attitude certainty, and importance about four topics: "death penalty," "exams," "libraries," and "recycling." As before, participants provided all relevant evaluations of one topic before moving onto the next, and topics were presented in a random order. All participants also responded to the DSS. Materials were presented in English to participants in the U.S. and in Chinese to participants in Taiwan. The survey was first designed in English, and measures of attitudinal ambivalence, certainty, and importance were translated into Chinese with back translation procedures. However, because a validated Chinese version of the DSS was already available, we did not do any further translating for this instrument.

Measures. All measures were the same as in Study 1. The three SA items again showed good internal reliability across topics (αs $\geq$ .87). To check that our samples differed in dialectical thinking, we administered the DSS using established English and Chinese versions (Spencer-Rodgers et al., 2004). Reliabilities were good for both the American (α = .82) and Taiwanese (α = .72) samples. Nine U.S. participants failed to provide a complete set of DSS responses and were excluded from analyses in which dialecticism was a variable.

Results and Discussion

As expected, dialecticism scores were higher in Taiwan (M = 4.48, SD = .43) than the U.S. (M = 3.81, SD = .56), $t(509) = 15.35$, $p < .001$, d = 1.37, 95% CI: [1.15, 1.59].[4]

We first averaged individuals' scores on all attitude attributes across the four topics (see Table 1 for summary statistics by topic and country; see Table 3 for raw correlations between variables). Consistent with our first hypothesis, Taiwanese participants reported greater OA (M = 0.81, SD = 1.92) than U.S. participants (M = 0.33, SD = 2.14), $t(518) = 2.67$, p = .008, d = .24, 95% CI: [0.06, 0.41]. SA, however, did not differ between cultures, $t(518) = -.84$, p = .40, d = -.07, 95% CI: [-0.25, 0.10]. Surprisingly, we also found that the Taiwanese sample reported more certainty across topics (M = 8.39, SD = 1.29) than the U.S. sample (M = 7.98, SD = 1.55), $t(518) = 3.31$, p = .001, d = .29, 95% CI: [0.12, 0.47], and more importance (M = 7.54, SD = 1.50) than the U.S. sample (M = 6.42, SD = 1.90), $t(518) = 7.51$, $p < .001$, d = .66, 95% CI: [0.48, 0.85]. In light of the unexpected differences in these variables, we tested the effect of culture on OA using an ANCOVA controlling for certainty and importance, and the hypothesized cross-cultural difference in OA remains significant in this model, $F(1, 516) = 16.00$, $p < .001$, $\eta_p^2 = .03$.

[4] Furthermore, replicating Study 1, DSS scores predicted average degree of OA (γ = .42, p = .005), moderated the correlation between positive and negative reactions (γ = .21, $p < .001$), and moderated the correspondence between OA and SA (γ = -.07, p = .008). Importantly, none of these three effects are significantly moderated by culture, ps > .28. Thus, the effects we observed for dialecticism in Study 1 are fully replicated in Study 2

Similar to Study 1, we also tested whether culture moderated the correlation between positive and negative ratings using the same mixed-effects modeling approach and found a significant culture × negative rating interaction on positive ratings, γ = -.38, t(2021.2) = -7.96, p < .001, 95% CI: [-.48, -.29] (Figure 3). Negativity and positivity were less negatively correlated in Taiwan, γ = -.26, t(2041.3) = -7.65, p < .001, 95% CI: [-.33, -.19], than in the U.S., γ = -.64, t(1987.3) = -18.95, p < .001, 95% CI: [-.71, -.58], suggesting that negatives and positives are viewed as being more in opposition for American participants than Taiwanese participants.

Finally, we tested whether culture moderated the correspondence between OA and SA using the same mixed-effects modeling approach from Study 1. Results reveal a significant interaction between OA and culture on SA, γ = .10, t(2055.8) = 3.45, p < .001, 95% CI: [.05, .16] (Figure 4). As expected, OA and SA were more strongly correlated among U.S. participants, γ = .32, t(2069.1) = 15.54, p < .001, 95% CI: [.28, .36], than among Taiwanese participants, γ = .21, t(2031.9) = 9.53, p < .001, 95% CI: [.17, .26]. This interaction remained significant when controlling for certainty and importance, γ = .06, t(2042.2) = 2.07, p = .04, 95% CI: [.004, .112]. Once again, results from this additional model support unique relationships between SA and certainty, γ = -.43, t(2066.5) = -21.67, p < .001, 95% CI: [-.46, -.39], and importance, γ = .05, t(2048.2) = 2.76, p = .006, 95% CI: [.01, .08].

General Discussion

Across ten different attitude objects, greater dialecticism was consistently related to (1) greater self-reported OA, (2) reduced linkage between positive and negative reactions, and (3) weaker correspondence between OA and SA. This was true both when treating dialecticism as an individual difference within U.S.-based samples and when treating dialecticism as a cross-cultural comparison. These effects were also shown to be independent from other relevant

attitude attributes (i.e., certainty and importance). Together, these findings provide critical insight into the psychology of dialecticism by observing naturally occurring attitudes toward a range of important issues (e.g., immigration reform and the death penalty).

Although research on ambivalence often assumes that people subjectively experience mixed-valence attitudes as problematic or unpleasant, we contribute to an emerging literature showing that having mixed reactions does not always have these consequences to the same degree (see also van Harreveld, van der Pligt, et al., 2009). In fact, because OA corresponds less with subjective feelings of being mixed and conflicted at higher degrees of dialecticism, dialecticism should also moderate other downstream consequences of ambivalence that seem to be driven by SA, such as the motivation to search for new information (e.g., Maio et al., 1996; Sawicki et al., 2013) or susceptibility to persuasion (cf. Ng et al., 2012). Nevertheless, our results still support a reliable OA-SA correlation even at higher levels of dialecticism. Although our data do not necessarily show that a more dialectical mindset eliminates the subjective reports of conflict that typically correspond with OA, it is still noteworthy that people higher in dialecticism are less uncomfortable with ambivalence, which could still temper these other attitudinal consequences.

One potential limitation of this research, however, is that the cross-cultural differences may be due less to the experience of ambivalence and more to cultural differences in the meanings of the attitude objects themselves. For example, we showed that Taiwanese students reported more ambivalence about “exams” than American students did. Although this may indeed reflect culturally distinct tendencies to view issues ambivalently, it may also reflect different cultural meanings of “exams.” We think this limitation is of minimal concern because the effects generalized across a set of very different topics, and the effect of dialecticism in Study

1 occurred even within a shared cultural context where each topic's meaning would have been constant across participants. Additionally, the interactive effects highlight how even when holding the meaning of an attitude object constant, increasing OA differently corresponds with SA in one culture versus another, again suggesting a more nuanced relationship between culture and the experience of ambivalence and not simply a difference in overall differences in what the topics mean in each culture.

Another limitation is our ability to make strong causal claims. Because we assessed relationships between observed variables, we cannot definitively claim that variation in dialectical thinking is what causes the ambivalence effects we observe. Nevertheless, prior research strongly suggests that dialectical thinking is a plausible causal agent. For example, Wang and colleagues (2016) experimentally manipulated dialectical mindsets and found that participants who were primed with a more dialectical mindset went on to express greater discomfort with mixed information about a novel consumer product (also see Pang et al., 2017). Other work has also used priming methods to show that dialectical thinking leads to more self-evaluative ambivalence (Spencer-Rogers et al., 2004). Thus, although our own data cannot directly provide evidence for causal relationships, our studies contribute to a literature that has established the potential for dialectical thinking to exert such causal effects.

Study 2 also revealed a surprising effect whereby Taiwanese participants reported more ambivalence as expected, but also more certainty. Typically, more ambivalent attitudes tend to be more uncertain (e.g., Petrocelli et al., 2007), and researchers have construed several effects of ambivalence as driven by the uncertainty it evokes (e.g., Jonas et al., 1997). Nevertheless, these two variables are not always correlated (McGraw et al., 2003) and are more accurately treated as independent characteristics (Clarkson et al., 2008; Luttrell et al., 2020; Luttrell, Petty, et al.,

2016; Luttrell, Stillman, et al., 2016). Indeed, a culture that is more likely to embrace truth in seemingly contradictory statements may also feel more certain about evaluative reactions overall (cf. Rucker et al., 2008). We note, however, that Study 1 found a negative correlation between dialecticism and average certainty. Perhaps this is a case where individual variation within a country does not adequately capture cross-cultural differences (Na et al., 2010), but we invite further research on this intriguing finding.

In sum, individual and cultural differences in the propensity to think dialectically have implications for the nature of people's attitudes toward a range of topics. Because ambivalence has played a strong role in previous research on attitudes across many domains, these findings offer exciting opportunities to further explore cultural effects on outcomes relevant to political, consumer, and health psychology, among other fields.

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Table 1. Summary statistics across studies.

		Objective Ambivalence	**Subjective Ambivalence**
Study 1: Sample A	Death Penalty	2.03 (3.43)	5.84 (2.53)
	Libraries	1.40 (3.15)	3.43 (2.15)
	Nuclear Power	3.20 (3.12)	5.54 (2.43)
	Recycling	-1.18 (3.60)	2.66 (2.07)
Study 1: Sample B	Gambling	2.77 (3.03)	4.54 (2.23)
	Gun Control	1.81 (3.67)	4.52 (2.54)
	Immigration Reform	3.02 (3.19)	5.47 (2.46)
	Organic Food	0.94 (3.49)	3.46 (2.07)
	Police Officers	1.66 (3.50)	4.40 (2.48)
Study 2: United States	Death Penalty	1.52 (3.51)	5.40 (2.59)
	Exams	1.58 (3.47)	4.68 (2.54)
	Libraries	-0.33 (3.45)	3.05 (2.11)
	Recycling	-1.45 (3.31)	2.86 (2.12)
Study 2: Taiwan	Death Penalty	1.93 (3.17)	5.27 (2.51)
	Exams	2.64 (2.82)	4.95 (2.57)
	Libraries	-1.00 (2.68)	2.57 (1.90)
	Recycling	-0.34 (2.69)	2.75 (1.92)

Note. For objective ambivalence, scores can range from -4 to 11. For subjective ambivalence, scores can range from 1 to 11. Standard deviations are presented in parentheses.

Table 2. Correlations between Dialecticism and Average Attitude Attributes in Study 1

	1	2	3	4
1. Dialecticism	--			
2. Objective Ambivalence	0.26**	--		
3. Subjective Ambivalence	0.22**	0.62**	--	
4. Certainty	-0.28**	-0.37**	-0.42**	--
5. Importance	0.04	0.04	0.17*	0.30**

Note. ** $p < .001$, *$p < .05$

Table 3. Correlations between Dialecticism and Average Attitude Attributes in Study 2

		1	2	3	4
United States Sample	1. Dialecticism	--			
	2. Objective Ambivalence	0.05	--		
	3. Subjective Ambivalence	0.23**	0.50**	--	
	4. Certainty	-0.17*	-0.47**	-0.45**	--
	5. Importance	0.04	-0.10	0.13	0.25**
Taiwanese Sample	1. Dialecticism	--			
	2. Objective Ambivalence	0.10	--		
	3. Subjective Ambivalence	0.13*	0.29**	--	
	4. Certainty	0.00	-0.23**	-0.63**	--
	5. Importance	0.11	-0.12*	-0.14*	0.28**

Note. ** $p < .001$, *$p < .05$

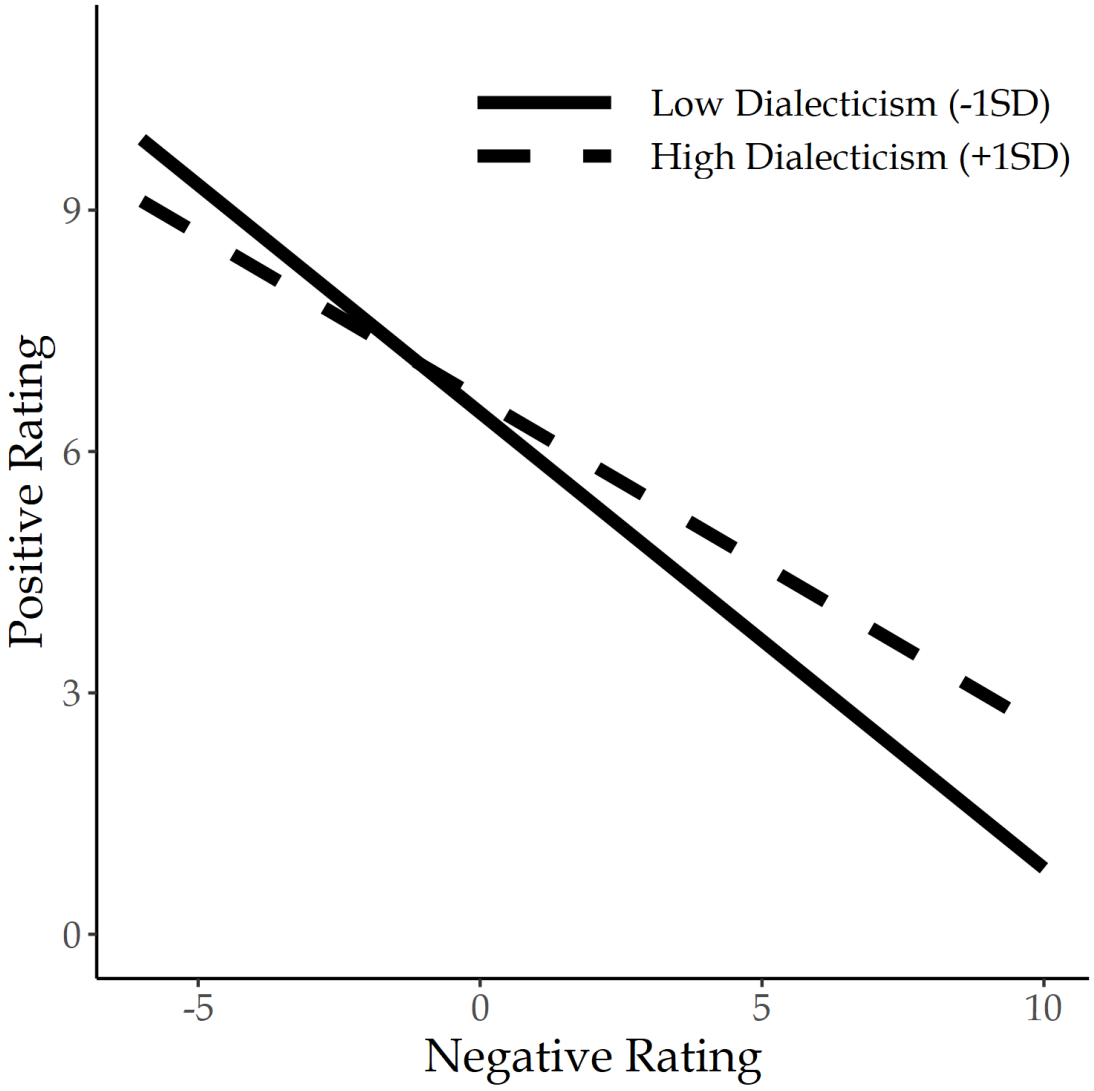

Figure 1. Individual differences in dialecticism moderate the relationship between positive and negative evaluations across nine topics (Study 1). Negative ratings are mean-centered within topic.

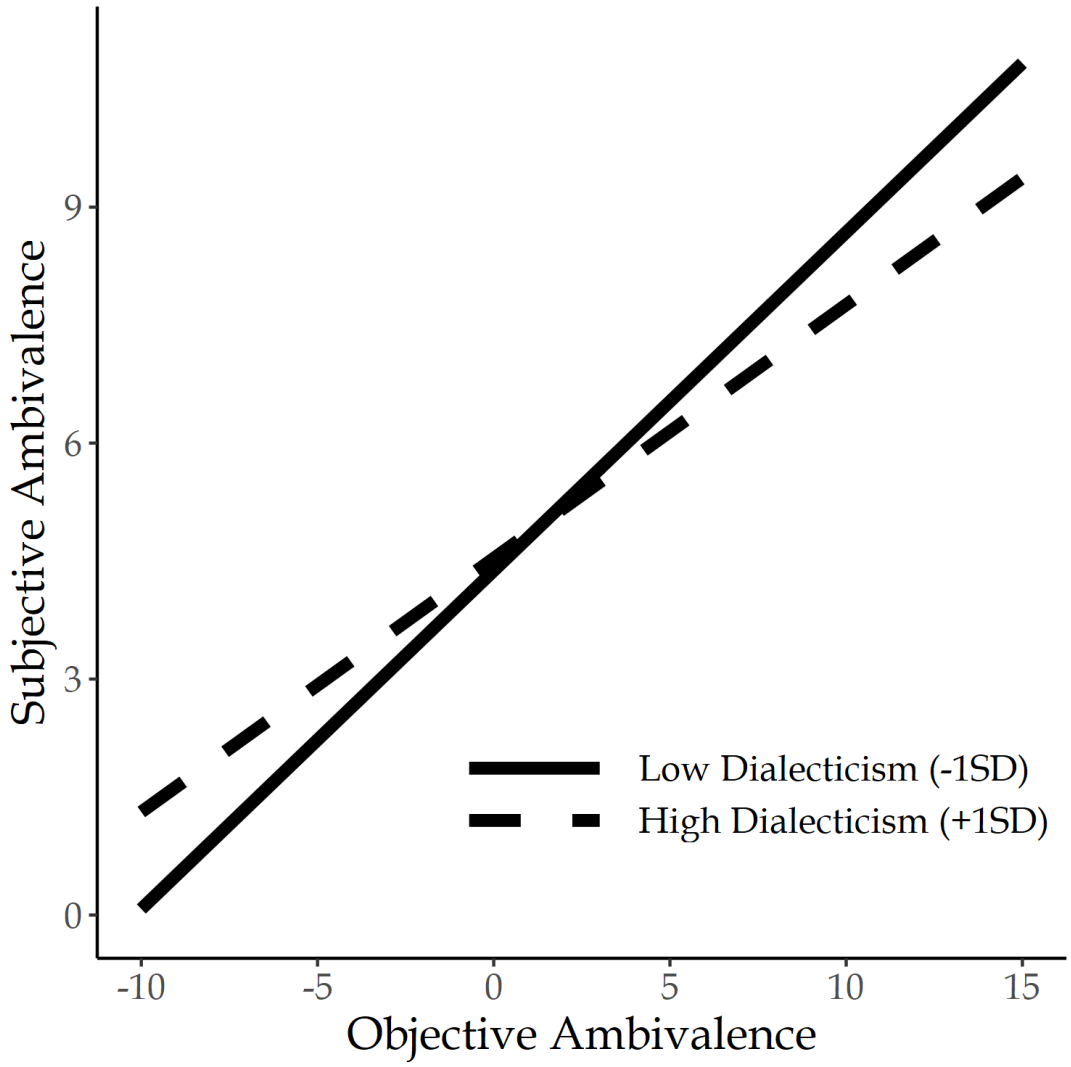

Figure 2. Individual differences in dialecticism moderate the relationship between objective and subjective ambivalence, across nine topics (Study 1). Objective ambivalence scores are mean-centered within topic.

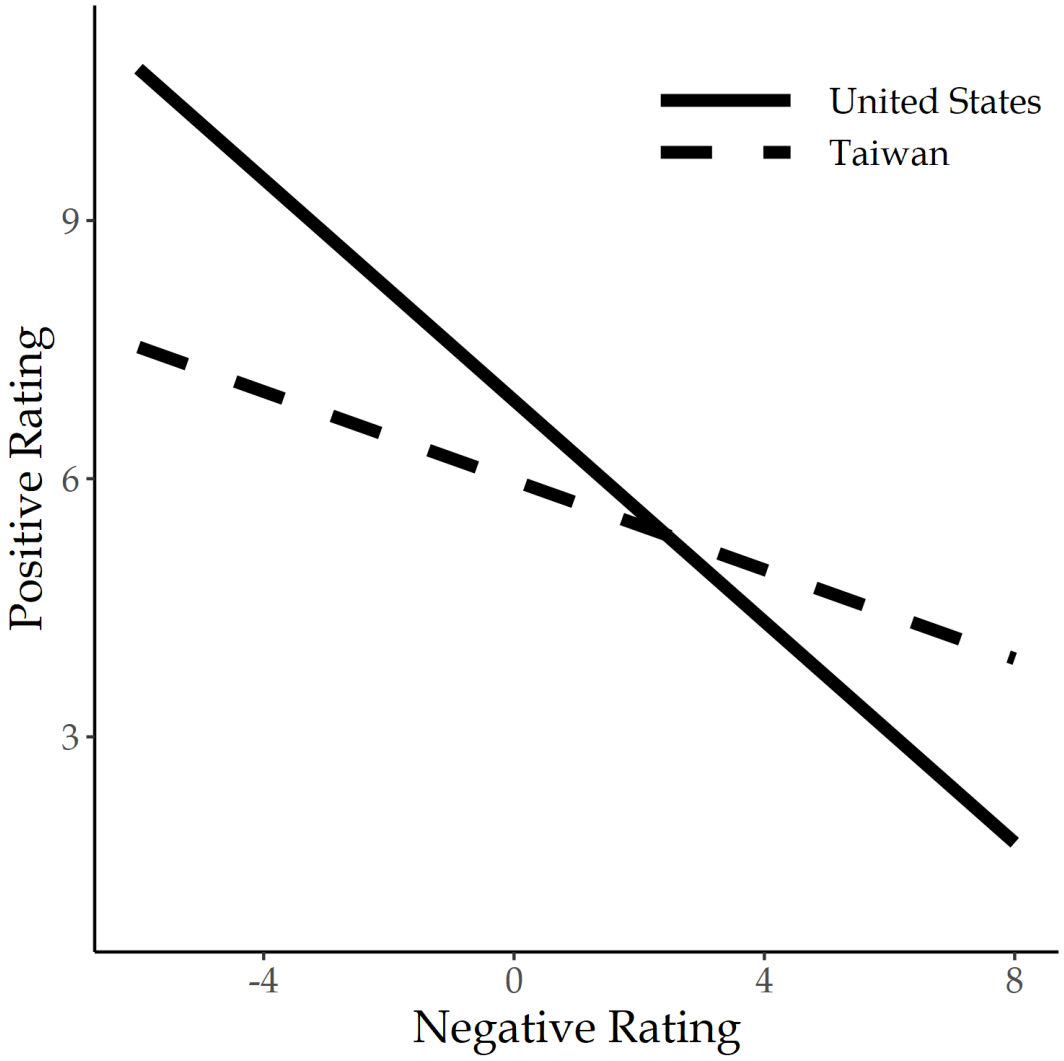

Figure 3. Culture moderates the relationship between positive and negative evaluations in Study 2. Negative ratings are mean-centered within topic.

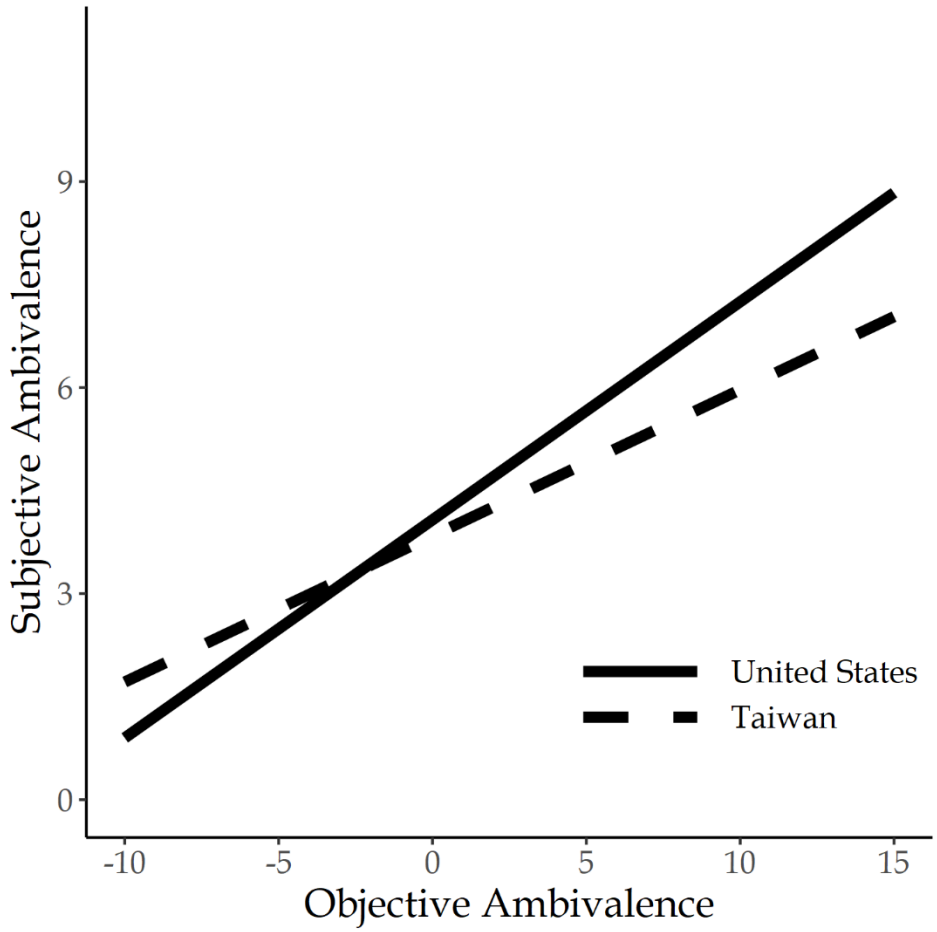

Figure 4. Culture moderates the relationship between objective and subjective ambivalence in Study 2. Objective ambivalence is mean-centered within topic.