

Research Article

“Every coin has two sides”: The effects of dialectical thinking and attitudinal ambivalence on psychological discomfort and consumer choice

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Abstract

Prior research suggests that consumers experience psychological discomfort when they make a choice under attitudinal ambivalence. The research reported here examines systematic cross-cultural variations in psychological discomfort as a function of dialectical thinking and attitudinal ambivalence in the context of choice. It shows that compared to nondialectical (Western) consumers, dialectical (Eastern) consumers experience less psychological discomfort when they hold bivalent evaluations of the focal object, but more psychological discomfort when they hold univalent evaluations (Study 1). It also identifies “uncertainty about making the correct choice” as the underlying process that accounts for these findings (Study 2). In addition, this research explores the downstream effects of psychological discomfort on choice deferral in the context of free choice (Study 3) and preference reversal in the context of forced choice (Study 4). Contributions to and implications for research on attitudinal ambivalence, choice behavior, and dialectical thinking are discussed.

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Introduction

Consumers often experience attitudinal ambivalence when deciding whether or not to purchase a product (Otnes, Lowrey, & Shrum, 1997). When exposed to both positive and negative attributes of the focal product, consumers may develop bivalent evaluations of it and experience a high level of ambivalence. Examples include deciding whether to book a hotel with cozy rooms but very few facilities, and whether to buy a car that is safe but not fun to drive. In contrast, consumers experience low

ambivalence when exposed to only positive or negative attributes of the focal product and develop correspondingly univalent evaluations of it (Kaplan, 1972).

Prior research has shown that bivalent evaluations, compared to univalent evaluations, increase consumers’ uncertainty about whether they will make the right choice and thus lead to greater psychological discomfort during decision making (van Harreveld, Rutjens, Rotteveel, Nordgren, & van der Pligt, 2009). However, cross-cultural research suggests that consumers with different levels of dialectical thinking may react differently. Dialectical thinking refers to the cognitive tendency to be more accepting of contradiction (Peng & Nisbett, 1999). Nondialectical thinkers perceive contradiction as a temporary state that should be avoided or resolved through formal logic. In contrast, dialectical thinkers believe that “every coin has two

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sides”; they regard contradiction as a permanent state that should be accepted and adapted to (Choi & Nisbett, 2000; Spencer-Rodgers, Boucher, Mori, Wang, & Peng, 2009).

We propose and demonstrate that the higher tolerance for contradiction among dialectical thinkers will reduce psychological discomfort when they are exposed to bivalent evaluations of the focal product. However, this effect will be reversed when dialectical thinkers are exposed to univalent evaluations. The presence of only positive or negative attributes of the product makes dialectical thinkers perceive the available information as incomplete (Priester, Petty, & Park, 2007). Perceived incompleteness of the available information leads to greater uncertainty about their choices and, consequently, a higher level of psychological discomfort than nondialectical thinkers would experience. These findings, especially for the univalent condition, are novel to the literature.

We then investigate the downstream effect of psychological discomfort on consumer choice. We show that in a free choice setting where consumers can defer the decision, dialectical thinking will reduce choice deferral when consumers choose on bivalent evaluations of the focal product, and increase choice deferral when choice is based on univalent evaluations. Further, we focus on a forced choice setting, where consumers have to choose among the provided alternatives. Previous research has revealed the relationship between decision-associated negative emotion and one-time choices (Luce, Bettman, & Payne, 1997; Nowlis, Kahn, & Dhar, 2002). We extend this line of research by focusing on a situation in which consumers have the opportunity to choose again after they have made the initial choice. This situation often occurs when consumers are deciding whether to return a product or come back to make a purchase that they had forgone earlier. We show that dialectical thinking will decrease preference reversal when consumers make a choice based on bivalent evaluation. These findings deepen our understanding of the implications of dialectical thinking for consumer decisions.

Attitudinal ambivalence and psychological discomfort

Attitudinal ambivalence is defined as the degree of conflict and tension between the opposing evaluations in attitude construction (Thompson, Zanna, & Griffin, 1995). This concept centers on the idea that people can hold positive and negative evaluations of the same object simultaneously (Cacioppo & Berntson, 1994; Petty, Briñol, & DeMarree, 2007). Two types of ambivalence have been documented in the literature—potential and felt (Priester & Petty, 1996). Potential ambivalence is an objective measure of the conflict in one’s separate evaluations of the positive and negative aspects of an object (Thompson et al., 1995). Felt ambivalence is a meta-judgmental measure indicating to what extent people feel conflicted and indecisive about the object (Newby-Clark, McGregor, & Zanna, 2002). Our research focuses on potential ambivalence. Specifically, high ambivalence is indicated by bivalent evaluations whereas low ambivalence is indicated by univalent evaluations.

Previous research finds that attitudinal ambivalence is positively associated with psychological discomfort (Hass, Katz, Rizzo, Bailey, & Moore, 1992; Katz & Hass, 1988; van Harreveld et al., 2009). This finding is consistent with the view that people prefer their attitudes to be congruent with one another (Festinger, 1957; Heider, 1946). Ambivalence-induced discomfort motivates consumers to minimize the negative experience. For example, consumers with higher ambivalence tend to engage in more systematic processing of object-related information (Jonas, Diehl, & Brömer, 1997). In choice contexts, consumers with higher ambivalence are more likely to prefer the option that is superior on the more important attributes (Nowlis et al., 2002), and to defer making decisions if allowed to do so (Roster & Richins, 2009).

A number of dispositional and contextual factors influence the association of attitudinal ambivalence with psychological discomfort. For instance, ambivalence is more associated with discomfort for people with higher preference for consistency (Newby-Clark et al., 2002) or lower tolerance for ambiguity (Nowlis et al., 2002). It is also found that ambivalence-induced discomfort is most likely to occur when a discrete choice is required for the focal object, as people often feel uncertain about whether they will make a correct choice, which is psychologically painful (van Harreveld et al., 2009). In this research, we examine the cultural influence on consumers’ reactions to ambivalence, which has been largely overlooked in the extant literature.

Dialectical thinking versus nondialectical thinking

Research on cross-cultural differences in reasoning has distinguished between formal logical thinking and dialectical thinking (Peng & Nisbett, 1999). Formal logical thinking (which we call nondialectical thinking) is rooted in the Aristotelian tradition and is predominant in Western cultures (Lewin, 1951). Dialectical thinking, on the other hand, is rooted in East Asian philosophical and religious traditions. How the two types of thinkers view contradiction is pertinent to the current discussion.

Nondialectical thinkers perceive contradiction as a temporary and transitory state that should be avoided and resolved (Lewin, 1951). Therefore, they tend to process information that confirms rather than challenges their prior theories (Clark, Wegener, & Fabrigar, 2008), to change their initial attitudes to reduce cognitive dissonance between attitude and behavior (Festinger, 1957), and to polarize their preferences for one side of the opposing arguments over the other (Bell & Esses, 2002; Nowlis et al., 2002; Peng & Nisbett, 1999). In contrast, dialectical thinkers believe in the pervasiveness of contradiction in reality. They accept contradiction as normal and adaptive (Spencer-Rodgers, Peng, Wang, & Hou, 2004). As a result, dialectical thinkers prefer dialectical proverbs (e.g., “Too humble is half proud”) to nondialectical ones (e.g., “For example is no proof”) (Peng & Nisbett, 1999), experience more mixed emotions (Schimmack, Oishi, & Diener, 2002; Spencer-Rodgers, Peng, & Wang, 2009), and tend to consider both sides in contradiction resolution (Peng & Nisbett, 1999).

Hypotheses development

Dialectical thinking, attitudinal ambivalence, and psychological discomfort

We propose that dialectical thinking has a systematic effect on consumers' affective reactions to bivalent and univalent evaluations of the focal product in decision making. Specifically, bivalent evaluations require trade-offs between the positive and negative attributes of the product. This trade-off will increase uncertainty about the correctness of the choice, because consumers will be unsure whether the positive attributes of the product outweigh the negative attributes or vice versa (Fischer, Luce, & Jia, 2000). Uncertainty about the correctness of the choice will lead to psychological discomfort during decision making (van Harreveld et al., 2009).

Both dialectical and nondialectical thinkers feel uncertain about the outcome of trade-offs. However, dialectical thinkers view contradiction as a permanent state of reality (Peng & Nisbett, 1999; Spencer-Rodgers, Boucher, et al., 2009; Spencer-Rodgers, Peng, et al., 2009). The conflict in bivalent evaluations accords with their worldview and implies that they are fully informed about the positive and negative aspects of the product and thus less at risk of making a poor decision. Hence, perceived completeness of the available information will counteract the choice uncertainty induced by the trade-off. As uncertainty about the correctness of the choice induces psychological discomfort during decision making (van Harreveld et al., 2009), dialectical thinkers who feel less uncertain about the choice correctness will experience a lower level of discomfort than nondialectical thinkers.

When they hold univalent evaluations of the focal product, both dialectical and nondialectical thinkers can make a choice without any obvious trade-offs. However, the presence of only positive or only negative attributes of the product will make dialectical thinkers perceive the available information to be incomplete and suspect that there is another side to the product (Priester et al., 2007; Wang, Batra, & Chen, 2016). As a result, their uncertainty about the correctness of choice will increase, resulting in a higher level of psychological discomfort for dialectical thinkers than nondialectical thinkers in a similar situation.

Conceptually, we expect similar effects of dialectical thinking on consumer reactions to positive and negative univalent evaluations. However, for pragmatic reasons, this research focuses on positive evaluations, as firms often promote sales by encouraging consumers to share positive evaluations of their products. Formally, we hypothesize that:

H₁. Compared to nondialectical thinkers, dialectical thinkers will experience (a) less psychological discomfort when they hold bivalent evaluations of the focal product, but (b) more psychological discomfort when they hold only positive evaluations of the focal product.

H₂. The interactive effect of dialectical thinking and attitudinal ambivalence on discomfort is mediated by consumers' uncertainty about the correctness of their choice.

Dialectical thinking, attitudinal ambivalence, and choice deferral

In a free choice setting, choice deferral—the decision not to make a choice at a given point in time—often arises when the timing of choice is not fixed (Dhar, 1997a). Consumers could postpone their decision to search for additional information about the existing alternatives or to search for new alternatives (Dhar, 1997b; Greenleaf & Lehmann, 1995).

Choice deferral can result from the desire to cope with decision-associated negative emotion (Luce, 1998). For instance, some choices involve conflict between important goals; it is psychologically painful when consumers must decide which goals to give up (Luce, Payne, & Bettman, 1999). To avoid the pain associated with such trade-offs, consumers tend to not make an immediate decision and to prolong the search, if that option is available (Luce, 1998). In this vein, the effect of dialectical thinking on consumers' affective reactions toward ambivalence will have implications on choice deferral. When holding bivalent evaluations of the focal product, nondialectical thinkers will be more likely than dialectical thinkers to defer the decision because searching for additional information can help them resolve the evaluative conflict. In contrast, when holding only positive evaluations, dialectical thinkers will be more likely than nondialectical thinkers to defer the decision because searching for additional information can provide them with a fuller understanding of the product. Thus, we hypothesize that:

H₃. Compared to nondialectical thinkers, dialectical thinkers will be (a) less likely to defer the decision when they hold bivalent evaluations of the focal product, but (b) more likely to defer the decision when they hold only positive evaluations of the focal product.

H₄. The experience of psychological discomfort during the decision process mediates the effect of dialectical thinking on choice deferral.

Dialectical thinking, attitudinal ambivalence, and preference reversal

Further, we argue that when consumers are forced to make a choice without the option to defer, the experience of psychological discomfort in the decision process will lead to a low sense of choice closure, which will increase the likelihood of preference reversal when they have the chance to choose again. Choice closure refers to the feeling that a decision process is finished and that the choice is final. Prior research shows that a high sense of choice closure will arise when decision makers identify the option that best meets their preference and choose accordingly (Gu, Botti, & Faro, 2013).

The experience of psychological discomfort during decision making will make consumers dwell on their choices, comparing the chosen and the forgone options and imagining what their situations would be had they chosen differently (Zeelenberg, 1999). As a result, consumers will feel their choice to be less closed. A lower sense of choice closure will decrease satisfaction and increase regret regarding past decisions (Gu et al., 2013; Li, Wei, & Soman, 2010), making consumers more likely to choose

differently when they have the chance to choose again. Accordingly, we hypothesize that:

H₅. Compared to nondialectical thinkers, dialectical thinkers will be (a) less likely to show preference reversal when they make a choice based on bivalent evaluations of the focal product, but (b) more likely to show preference reversal when they make a choice based on only positive evaluations of the focal product.

H₆. The effect of dialectical thinking on preference reversal is sequentially mediated by consumers' experience of psychological discomfort during the decision process and their sense of choice closure after they have chosen for the first time.

Fig. 1 summarizes the conceptual framework of this research.

Research overview

We conduct four studies to test our conceptual framework. Study 1 shows the effect of dialectical thinking on psychological discomfort under different levels of attitudinal ambivalence. Study 2 demonstrates the underlying process. Studies 3 and 4 explore the consequences of dialectical thinking on consumers' behavioral intentions of choice deferral and preference reversal, respectively.

Although dialectical thinking was first proposed to reflect differences in reasoning about contradiction between Westerners and Easterners (Peng & Nisbett, 1999), subsequent studies have shown that dialectical thinking can be primed (Alter & Kwan, 2009; Monga & John, 2008; Spencer-Rodgers et al., 2004; Wang et al., 2016). Thus, we primed dialectical thinking in all four studies, with the priming disguised as a reasoning exercise. Specifically, two seemingly contradictory research findings on a particular topic were presented (see Appendix A, Peng & Nisbett, 1999). Participants primed with dialectical thinking were asked to read the two findings carefully and then explain why they could both be plausible, whereas participants primed with nondialectical thinking were asked to choose which finding was more plausible and explain why. They did this reasoning exercise for two different topics sequentially.

We conducted two pretests, one with an American sample and the other with a Chinese sample, to check whether our priming of dialectical thinking would work for both cultures. In the first pretest, 34 students (18 females, $M_{\text{age}} = 23.82$) from a

large northeastern U.S. university were randomly assigned to either the dialectical or nondialectical condition. After priming, participants were asked to read two arguments (see Appendix B), with their presentation order counterbalanced. The arguments were adapted from Peng and Nisbett (1999). Participants rated the persuasiveness of each argument, and we calculated a difference score ($M_{\text{dialectical}} - M_{\text{nondialectical}}$) to indicate their preference for the dialectical argument. A one-way ANOVA on argument preference showed that participants primed with dialectical thinking had a higher preference for the dialectical argument than those primed with nondialectical thinking ($M_{\text{dialectical}} = .59$, $M_{\text{nondialectical}} = -.76$, $F(1, 32) = 3.98$, $p = .055$).

The second pretest followed the same procedure, with all materials translated into Chinese. Thirty-three students (22 females, $M_{\text{age}} = 21.75$) from a large university in China were randomly assigned to one of the two conditions. As expected, participants' preference for the dialectical argument differed between the two conditions ($M_{\text{dialectical}} = 2.12$, $M_{\text{nondialectical}} = -.67$, $F(1, 31) = 8.46$, $p = .007$). Taken together, the two pretests suggested that our priming of dialectical and nondialectical thinking worked for both cultures (Peng & Nisbett, 1999).

Study 1

Study 1 tested whether dialectical thinking decreases psychological discomfort when consumers make a choice based on bivalent evaluations of the focal product, but increases discomfort when they make a choice based on only positive evaluations (H₁).

Method

Design and sample. Study 1 adopted a 2 (dialectical thinking: dialectical vs. nondialectical) \times 2 (attitudinal ambivalence: positive vs. bivalent) between-subjects design. A total of 125 undergraduate students from the same U.S. university where the first pretest was conducted took part in the experiment for course credit. Six participants who did not follow instructions (writing nonrelevant responses such as "thank you" and "I don't know" in the priming task) and two participants who ran into Internet connection problems during the experiment were

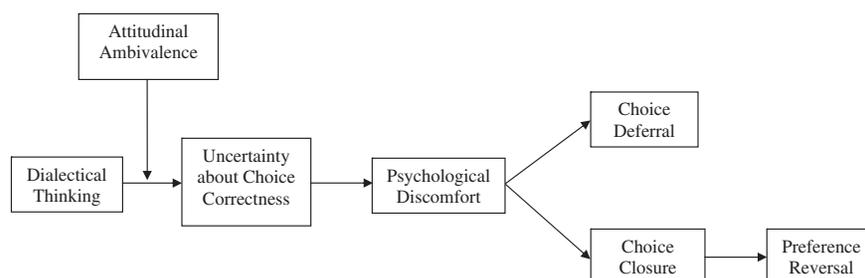


Fig. 1. Conceptual framework of this research.

excluded from the analyses. The final sample had 117 participants (45 females, $M_{\text{age}} = 19.81$).

Procedure and measures. Participants were randomly assigned to one of the four conditions. The experiment consisted of two tasks. Dialectical thinking was primed first. After priming, participants rated how difficult the task was on a seven-point scale (1 = *very easy*, 7 = *very difficult*), as the perceived difficulty of the task might affect their emotions.

In the second task, participants were asked to imagine that they were planning to take a trip to Miami and wanted to book a hotel on Expedia.com. There was a daily deal for a hotel, with only one room left. Participants read consumer reviews of the hotel before they decided whether or not to take the deal. Six hotel reviews were presented, all positive in the positive condition and half positive, half negative in the bivalent condition (see Appendix C). All were authentic reviews of a real hotel, which was referred to as Hotel A to avoid any preexisting biases. A pretest ($n = 45$) indicated that the two lists of reviews were perceived as equally comprehensible, credible, and helpful (all $ps > .10$).

After reading the reviews, participants evaluated the positive (*positive*, *favorable*, and *satisfied*) on a four-point scale with 0 = *not at all*, 1 = *slightly*, 2 = *moderately*, and 3 = *very much*) and negative aspects (*negative*, *unfavorable*, and *dissatisfied*) on a four-point scale with -3 = *very much*, -2 = *moderately*, -1 = *slightly*, and 0 = *not at all*, recoded to be consistent with the positive aspects for subsequent analyses) of the hotel separately. Next, they reported the level of psychological discomfort by indicating to what extent they were feeling *agitated*, *tense*, and *anxious* at that moment (1 = *not at all*, 7 = *extremely*) (Nordgren, van Harreveld, & van der Pligt, 2006; van Harreveld et al., 2009), and then decided whether to take the deal or not. After completing the survey, participants were debriefed and thanked. No one expressed any suspicions about the purpose of the experiment.

Results

Manipulation check on ambivalence and priming task difficulty. We first transformed participants' separate evaluations of the positive and negative aspects of the hotel into an ambivalence index using the similarity-intensity model (Thompson et al., 1995). In this model, if P is the positivity score and N is the absolute value of the negativity score, then the ambivalence index equals $([P + N]/2 - \text{absolute value } [P - N]) + C$, where C is an arbitrary positive constant to facilitate a realistic interpretation. We set C to be 2 for all studies in this research. A 2×2 ANOVA on the ambivalence index showed only a significant main effect of information set ($M_{\text{positive}} = 1.44$, $M_{\text{bivalent}} = 3.09$, $F(1, 113) = 79.61$, $p < .001$), which indicated the success of our manipulation.

A one-way ANOVA revealed that participants rated the dialectical reasoning exercise as more difficult than the nondialectical one ($M_{\text{dialectical}} = 3.95$, $M_{\text{nondialectical}} = 3.18$, $F(1, 115) = 8.11$, $p = .005$). Thus, we treated priming task difficulty as a covariate in the subsequent analyses to control

for its potential effects on the dependent variables (results not controlling for priming task difficulty are consistent, as shown in Appendix F).

Psychological discomfort and choice outcomes. We conducted a 2×2 ANCOVA on psychological discomfort to test H_1 . After controlling for priming task difficulty ($F(1, 112) = .06$, $p = .811$), we found a significant interaction between dialectical thinking and ambivalence ($F(1, 112) = 8.14$, $p = .005$). Compared to nondialectical thinkers, dialectical thinkers experienced numerically less discomfort when holding bivalent evaluations of the hotel ($M_{\text{dialectical}} = 2.57$, $M_{\text{nondialectical}} = 3.22$, $F(1, 112) = 3.36$, $p = .069$, Cohen's $d = -.68$) but more discomfort when holding only positive evaluations of the hotel ($M_{\text{dialectical}} = 3.01$, $M_{\text{nondialectical}} = 2.24$, $F(1, 112) = 4.59$, $p = .034$, Cohen's $d = .76$; see Table 1). Thus, H_1 was supported. No other significant effects were found.

We then examined the simple effect of ambivalence on psychological discomfort. For nondialectical thinkers, bivalent evaluations induced more discomfort than positive evaluations did ($p = .05$), a result in line with the ambivalence literature (van Harreveld et al., 2009; Wang et al., 2016). For dialectical thinkers, positive evaluations led to more discomfort than bivalent evaluations did, but the difference was not statistically significant ($p = .136$). With regard to the choice outcomes, as expected, participants holding only positive evaluations were more likely to take the deal than those holding bivalent evaluations (83.3% vs. 15.8%, $\chi^2(1) = 53.35$, $p < .001$). No effect of dialectical thinking was found on choice ($p = .778$).

In sum, Study 1 provides initial evidence for the interactive effect of dialectical thinking and attitudinal ambivalence on psychological discomfort and thus supports H_1 .

Study 2

Study 2 has two key objectives. First, we replicate the interactive effect of dialectical thinking and attitudinal ambivalence on psychological discomfort using a Chinese sample. Second, we examine the mediating process of uncertainty about the choice correctness underlying this interactive effect (H_2).

Method

Design and sample. Study 2 used a 2 (dialectical thinking: dialectical vs. nondialectical) \times 2 (attitudinal ambivalence: positive vs. bivalent) between-subjects design. Participants were 120 undergraduate students from a Chinese university (same as pretest 2) who received monetary compensation. Excluding 10 participants whose responses to the emotion measures or the manipulation check questions were categorized as outliers (3SD) gave us a final sample of 110 participants (76 females, $M_{\text{age}} = 21.15$; results with the outliers are shown in Appendix F).

Procedure and measures. Study 2 consisted of a priming task and a choice task. In the choice task, participants were asked to imagine that they wanted to buy an MP4 player and were searching for alternatives on Amazon.cn. They were instructed

Table 1
Descriptive statistics of the dependent variables in Studies 1–4.

			<i>n</i>	Psychological discomfort ^a	Uncertainty about choice correctness ^a	Choice (first-time) ^b	Choice deferral ^c	Choice closure ^a	Preference reversal ^d
Study 1	Positive	Nondialectical	29	2.24 (1.24)	–	79.3%	–	–	–
		Dialectical	31	3.01 (1.35)	–	87.1%	–	–	–
	Bivalent	Nondialectical	27	3.22 (1.56)	–	22.2%	–	–	–
		Dialectical	30	2.57 (1.24)	–	10.0%	–	–	–
Study 2	Positive	Nondialectical	23	2.59 (1.35)	3.17 (.91)	78.30%	–	–	–
		Dialectical	30	3.27 (1.60)	3.85 (1.31)	70.00%	–	–	–
	Bivalent	Nondialectical	27	2.98 (1.29)	3.57 (1.02)	37.00%	–	–	–
		Dialectical	30	1.87 (1.05)	3.07 (1.01)	36.70%	–	–	–
Study 3	Positive	Nondialectical	61	2.03 (1.02)	–	68.8%	18.8%	–	–
		Dialectical	65	2.65 (1.36)	–	56.2%	40.6%	–	–
	Bivalent	Nondialectical	36	3.82 (1.18)	–	13.9%	77.8%	–	–
		Dialectical	28	3.07 (1.14)	–	35.7%	53.6%	–	–
Study 4	Positive	Nondialectical	60	2.42 (1.03)	–	63.30%	–	4.54 (1.23)	20.70% (29)
		Dialectical	59	2.94 (1.15)	–	64.40%	–	4.09 (1.15)	18.50% (27)
	Bivalent	Nondialectical	60	2.87 (1.36)	–	43.30%	–	4.33 (1.08)	51.50% (33)
		Dialectical	60	2.28 (1.09)	–	33.30%	–	4.98 (1.35)	21.20% (33)

^a Mean and standard deviation in parentheses.

^b Percentage choosing to take the hotel deal (Studies 1, 3, and 4) or purchase the MP4 player (Study 2).

^c Percentage choosing to defer the choice.

^d Percentage choosing differently; total number of responses in the follow-up survey in parentheses.

to carefully read the reviews of an MP4 player on sale and decide whether or not they would buy the product. Six consumer reviews of a fictitious brand were presented, all positive in the positive condition and half positive, half negative in the bivalent condition. We selected authentic reviews from Amazon.cn and fine-tuned them to make their lengths comparable (see Appendix D). A pretest ($n = 56$) indicated that the reviews were perceived as equally comprehensible, credible, and helpful (all $ps > .10$).

As in Study 1, after reading the scenario, participants rated the positive and negative aspects of the MP4 player separately and then indicated to what extent they were certain that *they would make the right choice* and that *the other option would not turn out to be better*, on a seven-point scale anchored by 1 = *highly uncertain* and 7 = *highly certain* (van Harreveld et al., 2009). We next measured their feeling of psychological discomfort at that moment, along with two other emotions—anger and sadness—to check whether the proposed effects applied only to psychological discomfort and not to other negative emotions. Participants then made a choice between “purchase” and “not purchase.” In the end, participants were debriefed and compensated. No one expressed any suspicions about the purpose of the experiment.

Results

Manipulation check on ambivalence and priming task difficulty. A 2×2 ANOVA on the ambivalence index indicated that participants exposed to mixed reviews developed greater ambivalence toward the MP4 player than those exposed to positive reviews only ($M_{\text{positive}} = 1.42$, $M_{\text{bivalent}} = 3.08$, $F(1, 106) = 149.98$, $p < .001$). No other significant effects were found. Thus, our manipulation of attitudinal ambivalence worked as expected.

A one-way ANOVA on priming task difficulty revealed that participants perceived the dialectical and nondialectical reasoning exercises as equally difficult ($M_{\text{dialectical}} = 3.75$, $M_{\text{nondialectical}} = 3.36$, $F(1, 108) = 2.25$, $p = .136$). Therefore, we did not control for this variable in the subsequent analyses (results with task difficulty as a covariate are reported in Appendix F).

Psychological discomfort and choice outcomes. A 2×2 ANOVA on psychological discomfort suggested that, in general, bivalent evaluations induced marginally less discomfort than did positive evaluations ($M_{\text{positive}} = 2.97$, $M_{\text{bivalent}} = 2.39$, $F(1, 106) = 3.84$, $p = .053$). More importantly, we found an interaction between dialectical thinking and ambivalence ($F(1, 106) = 12.24$, $p = .001$). Dialectical thinkers experienced significantly less psychological discomfort than did nondialectical thinkers when holding bivalent evaluations of the MP4 player ($M_{\text{dialectical}} = 1.87$, $M_{\text{nondialectical}} = 2.98$, $F(1, 106) = 9.88$, $p = .002$, Cohen’s $d = -1.12$). This pattern was reversed at a marginally significant level when participants were holding only positive evaluations ($M_{\text{dialectical}} = 3.27$, $M_{\text{nondialectical}} = 2.59$, $F(1, 106) = 3.37$, $p = .069$; Cohen’s $d = .68$; see Table 1). Thus, H_1 was supported.

In addition, we performed 2×2 ANOVAs on sadness and anger, and found that dialectical thinking had no significant effect on either emotion (for the main effect on sadness, $F(1, 106) = .20$, $p = .659$; for the interactive effect on sadness, $F(1, 106) = 2.01$, $p = .160$; for the main effect on anger, $F(1, 106) = 2.20$, $p = .141$; for the interactive effect on anger, $F(1, 106) = .31$, $p = .582$). These findings suggested that dialectical thinking influenced only psychological discomfort but not other negative emotions.

As for the simple effect of ambivalence on discomfort, bivalent evaluations led to more discomfort than positive

evaluations did for nondialectical thinkers ($p = .042$), and this effect was reversed for dialectical thinkers ($p < .001$). For choice outcomes, participants who read only positive reviews were more likely to purchase the product than those who read bivalent reviews (73.6% vs. 36.8%, $\chi^2(1) = 14.95$, $p < .001$). Dialectical thinking did not affect choice ($p = .963$).

Mediating effect of uncertainty about choice correctness. The measurement of uncertainty was recoded such that a higher rating indicated a higher level of uncertainty. A 2×2 ANOVA on uncertainty revealed an interaction between dialectical thinking and ambivalence ($F(1, 106) = 8.10$, $p = .005$). When making a choice based on bivalent evaluations, dialectical thinkers experienced a numerically lower level of choice uncertainty than did nondialectical thinkers ($M_{\text{dialectical}} = 3.07$, $M_{\text{nondialectical}} = 3.57$, $F(1, 106) = 3.11$, $p = .081$, Cohen's $d = -.51$), and this effect was reversed when the choice was based on only positive evaluations ($M_{\text{dialectical}} = 3.85$, $M_{\text{nondialectical}} = 3.17$, $F(1, 106) = 5.06$, $p = .027$, Cohen's $d = .68$; see Table 1).

We then used a bootstrapping approach (Hayes, 2013) to test the proposed mediating process. As predicted in H_2 , the mediating effect of uncertainty about choice correctness was positive when participants held univalent evaluations of the MP4 player (95% CI = [.03, .73]) and negative when they held bivalent evaluations (95% CI = [-.62, -.01]; see Fig. 2).

Discussion of Study 1 and Study 2

In Studies 1 and 2, we primed consumers with dialectical or nondialectical thinking and investigated their affective

reactions in decision making when exposed to different levels of attitudinal ambivalence (bivalent or positive) toward the focal product. Results in both studies showed an interactive effect of dialectical thinking and attitudinal ambivalence on psychological discomfort. These findings supported H_1 and were robust across Western (Study 1) and Eastern (Study 2) cultures. In addition, we revealed uncertainty about choice correctness as the process underlying this interactive effect in Study 2.

It should be noted that in both studies dialectical thinking had no significant impact on the participants' decision to purchase. Specifically, the experience of psychological discomfort during decision making did not influence the final purchase decision. Past research shows that in a forced choice context, decision-associated negative emotion motivates consumers to choose the alternative that is superior on the attribute that is emotionally more difficult to sacrifice (Luce et al., 1999) or the alternative that is superior on the more important attributes (Nowlis et al., 2002). Both strategies can help consumers alleviate the negative emotions caused by decision making.

According to this line of research, we expected that when participants held bivalent evaluations of the focal product, the decision-associated discomfort would influence choice outcomes if attributes in the positive and negative reviews were of varying levels of importance to participants. However, in both studies, we manipulated ambivalence using reviews that commented on key attributes of the focal product. Thus, the attributes in the positive and negative reviews might have no systematic differences in importance or emotional difficulty to

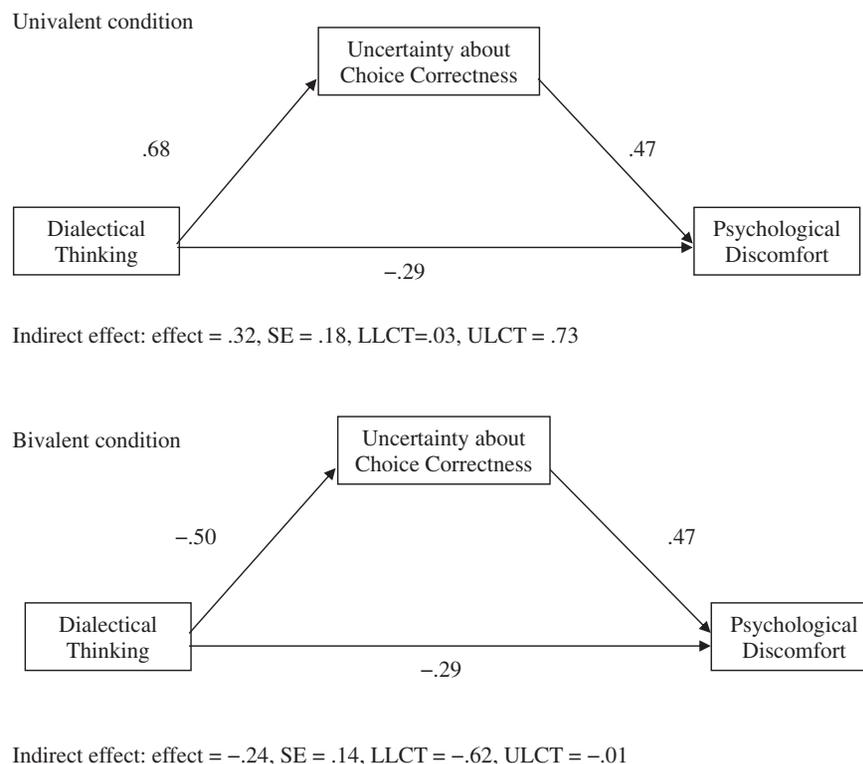


Fig. 2. The mediating role of uncertainty about choice correctness in the effect of dialectical thinking on psychological discomfort (Study 2).

sacrifice. As the experience of psychological discomfort could not be reduced by choosing one option over the other, it was not surprising that we found no effect of psychological discomfort on choice outcomes.

When participants held only positive evaluations of the focal product, the perception that the available information was incomplete caused dialectical thinkers to experience greater discomfort. Intuitively, consumers could avoid this negative experience by not purchasing. However, in our choice setting, participants had to decide whether to take or decline a deal that would expire shortly. Such a choice setting would be emotional, making the deal hard to forgo and leading both dialectical and nondialectical thinkers to a similar choice outcome.

Although we did not observe differences in terms of participants' purchase decisions in a forced choice context, psychological discomfort could change choice outcomes in other settings. To test this possibility, we next examine two specific choice contexts in which differences in choice outcomes may be observed: a choice deferral context (Study 3) and a preference reversal context (Study 4).

Study 3

Study 3 examines the effect of dialectical thinking on choice deferral. We predict that dialectical thinking reduces choice deferral when consumers hold bivalent evaluations of the focal product, and this effect is reversed when consumers hold only positive evaluations (H_3). Further, these effects are mediated by psychological discomfort (H_4).

Another objective of Study 3 is to understand better the effect of dialectical thinking on psychological discomfort when consumers hold only positive evaluations of the focal product, as this finding is especially novel to the literature. We explore whether this effect varies with the amount of positive information. Specifically, the coexistence of positive and negative information is more likely when more product information is available (Tversky & Kahneman, 1974). Thus, when consumers are presented with a greater amount of product information, a preponderance of positive information might lead dialectical thinkers to perceive the available information as more incomplete and result in greater discomfort in decision making. To test this proposition, Study 3 incorporates two positive conditions with varying amounts of information.

Method

Design and sample. Study 3 adopted a 2 (dialectical thinking) \times 3 (attitudinal ambivalence) between-subjects design. We manipulated attitudinal ambivalence at three levels, including bivalent evaluations, positive evaluations based on less information (six reviews, referred to as the positive-less condition), and positive evaluations based on more information (ten reviews, referred to as the positive-more condition). We recruited 196 participants on a survey website in China. Six participants who did not follow instructions in the priming task were excluded (writing nonrelevant responses such as a random

number), resulting in a final sample of 190 (103 females, $M_{\text{age}} = 31.46$).

Procedure and measures. The procedure and questionnaire for Study 3 were similar to those for Study 1, with two exceptions. First, we used the same reviews as in Study 1 for the positive-less condition and the bivalent condition, with all information translated into Chinese. For the positive-more condition, we added four more positive reviews of the hotel. Second, after reading the reviews, participants were asked to choose among four options: (1) "take the deal," (2) "not take the deal," (3) "search for more reviews of Hotel A and decide later," and (4) "search for other hotels and decide later" (Dhar, 1997a). Options 1 and 2 were coded 0 (no deferral), whereas options 3 and 4 were coded 1 (deferral).

Results and discussion

Manipulation check on ambivalence and priming task difficulty. A 2 \times 3 ANOVA on the ambivalence index revealed a main effect of ambivalence ($F(2, 184) = 34.13$, $p < .001$). Participants exposed to bivalent reviews ($M_{\text{bivalent}} = 3.68$) reported greater ambivalence toward the hotel than those exposed to six ($M_{\text{positive-less}} = 2.65$, $p < .001$) or ten ($M_{\text{positive-more}} = 2.53$, $p < .001$) positive reviews. No significant difference was found between the two positive conditions ($p = .455$).

A one-way ANOVA on priming task difficulty suggested that participants perceived the dialectical and nondialectical reasoning exercises as equally difficult ($M_{\text{dialectical}} = 3.59$, $M_{\text{nondialectical}} = 3.35$, $F(1, 188) = 1.18$, $p = .280$). Thus, we did not control for this variable in the subsequent analyses (results with task difficulty as a covariate are reported in Appendix F).

Psychological discomfort. A 2 (dialectical thinking) \times 2 (ambivalence: positive-less vs. positive-more) ANOVA on discomfort indicated no significant difference between the two positive conditions ($F(1, 122) = .13$, $p = .719$). The number of reviews also had no interactive effect with dialectical thinking ($F(1, 122) = .002$, $p = .966$). We then combined the two conditions in subsequent analyses.

A 2 (dialectical thinking) \times 2 (ambivalence: bivalent vs. positive) ANOVA on discomfort indicated a main effect of ambivalence ($M_{\text{bivalent}} = 3.49$, $M_{\text{positive}} = 2.35$, $F(1, 186) = 35.82$, $p < .001$). Further, consistent with the first two studies, we found a significant interaction between ambivalence and dialectical thinking ($F(1, 186) = 13.82$, $p < .001$). Dialectical thinking reduced discomfort when participants held bivalent evaluations of the hotel ($M_{\text{nondialectical}} = 3.82$, $M_{\text{dialectical}} = 3.07$, $F(1, 186) = 6.19$, $p = .014$, Cohen's $d = -.75$), and this pattern was reversed for the univalent condition ($M_{\text{nondialectical}} = 2.03$, $M_{\text{dialectical}} = 2.65$, $F(1, 186) = 8.53$, $p = .004$, Cohen's $d = .62$). Analyses on the simple effect of ambivalence indicated that bivalent evaluations led to greater discomfort than positive evaluations for nondialectical thinkers ($p < .001$), and this effect was not significant for dialectical thinkers ($p = .123$).

Choice deferral and the mediating process of discomfort. We first performed Chi-square analyses on choice deferral for the two positive conditions, and found no significant differences between them for both dialectical thinkers ($\chi^2(1) = 1.24, p = .266$) and nondialectical thinkers ($\chi^2(1) = 1.26, p = .261$). We then combined the two positive conditions. Results showed that compared to nondialectical thinkers, dialectical thinkers were less likely to defer the choice when they held bivalent evaluations of the hotel (53.6% vs. 77.8%, $\chi^2(1) = 4.19, p = .041$); but they were more likely to do so when holding only positive evaluations (47.7% vs. 24.6%, $\chi^2(1) = 7.25, p = .007$; see Table 1). Thus, H₃ was supported.

We conducted the mediation test using the bootstrapping method (Hayes, 2013). Results showed that the indirect effect of psychological discomfort was negative when participants held bivalent evaluations (95% CI = [-1.17, -.17]) but positive (95% CI = [.12, .91]) when they held only positive evaluations. Thus, H₄ was supported (see Fig. 3 for detailed results).

Discussion

Study 3 revealed the impact of dialectical thinking on psychological discomfort in a free choice situation in which consumers could defer the decision. In line with the choice deferral literature (Luce, 1998), we showed that the experience of psychological discomfort in decision making increased consumers' tendency to postpone their decisions. We also explored whether the effect of dialectical thinking on psychological discomfort was influenced by the number of reviews in the positive condition but did not find a significant difference. It is possible that there was no psychological difference to the

participants between six reviews and ten reviews, so the reviews induced similar perceptions that the product information was complete.

Study 4

Study 4 examines the consequences of dialectical thinking on consumers' behavioral intentions of preference reversal (H₅), as well as the sequential mediating roles of psychological discomfort and choice closure in this effect (H₆).

Method

Design and sample. Study 4 adopted a 2 (dialectical thinking: dialectical vs. nondialectical) \times 2 (attitudinal ambivalence: positive vs. bivalent) between-subjects design. We recruited 239 undergraduate students (154 females, $M_{age} = 19.95$) at a large university in China who received monetary compensation for their participation in the experiment.

Procedure, manipulations, and measures. The experiment had two stages, with a week's gap between them. In the first stage, we used the same procedure, manipulations, and measures as in Study 1 (all materials were translated into Chinese), with two exceptions. First, after participants chose to take or decline the hotel deal, we measured choice closure by asking them to what extent they perceived their choices as *unfinished business* and *behind them* (Beike & Wirth-Beaumont, 2005; Gu et al., 2013). Second, at the end of the questionnaire, we informed participants that there would be a follow-up survey in a week's

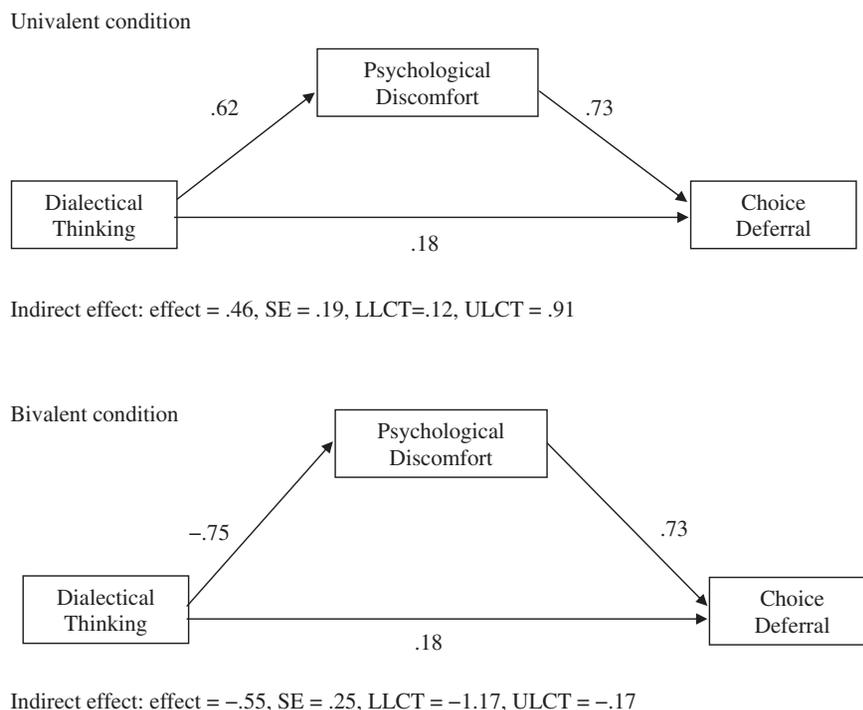


Fig. 3. The mediating role of psychological discomfort in the effect of dialectical thinking on choice deferral (Study 3).

time and that they needed to provide an email address to which we could send the survey link.

A week later, participants were asked to revisit their decision on the hotel, and were given a recall task. After two rounds of reminder emails for the follow-up survey, we collected 122 responses. The response rate was 51.05%.

Results and discussion

Manipulation checks on ambivalence and priming task difficulty. A 2×2 ANOVA on the ambivalence index indicated that participants who read bivalent reviews developed greater ambivalence toward the hotel than those who read only positive reviews ($M_{\text{bivalent}} = 3.73$, $M_{\text{positive}} = 3.08$, $F(1, 235) = 42.35$, $p < .001$), which suggested the success of our manipulation. No other significant effects were found.

A one-way ANOVA on priming task difficulty showed that participants perceived the dialectical and nondialectical reasoning exercises to be equally difficult ($M_{\text{nondialectical}} = 3.69$, $M_{\text{dialectical}} = 3.70$, $F(1, 237) = .001$, $p = .977$). Hence, we did not control for this variable in the subsequent analyses (results with task difficulty included as a covariate are shown in Appendix F).

Psychological discomfort. A 2×2 ANOVA on psychological discomfort revealed an interaction between dialectical thinking and ambivalence ($F(1, 235) = 13.67$, $p < .001$). As predicted, dialectical thinkers experienced a lower level of discomfort than nondialectical thinkers did when holding bivalent evaluations of the hotel ($M_{\text{dialectical}} = 2.28$, $M_{\text{nondialectical}} = 2.87$, $F(1, 235) = 7.64$, $p = .006$, Cohen's $d = -.59$), and this pattern was reversed when participants held only positive evaluations ($M_{\text{dialectical}} = 2.94$, $M_{\text{nondialectical}} = 2.42$, $F(1, 235) = 6.07$, $p = .014$, Cohen's $d = .53$). The analyses on the simple effect of ambivalence showed that bivalent evaluations led to more discomfort for nondialectical ($F(1, 235) = 4.57$, $p = .034$) but less discomfort for dialectical thinkers ($F(1, 235) = 9.54$, $p = .002$).

Choice closure and preference reversal. A 2×2 ANOVA on choice closure revealed a main effect of ambivalence. In general, participants experienced a higher sense of choice closure when they held bivalent rather than positive evaluations of the hotel ($M_{\text{bivalent}} = 4.65$, $M_{\text{positive}} = 4.32$, $F(1, 235) = 4.64$, $p = .032$). More important, we found a significant dialectical thinking \times ambivalence interaction ($F(1, 235) = 12.54$, $p < .001$). Compared to nondialectical thinkers, dialectical thinkers felt greater closure about their choices when they made choices based on bivalent evaluations ($M_{\text{dialectical}} = 4.98$, $M_{\text{nondialectical}} = 4.33$, $F(1, 235) = 8.91$, $p = .003$, Cohen's $d = .66$), and this effect was reversed when they made choices based on only positive evaluations ($M_{\text{dialectical}} = 4.09$, $M_{\text{nondialectical}} = 4.54$, $F(1, 235) = 4.10$, $p = .044$, Cohen's $d = -.45$).

We then examined participants' choice outcomes. For the initial choice, only a main effect of attitudinal ambivalence was found, showing that positive evaluations led to a greater likelihood of purchase than ambivalent evaluations (63.9% vs. 38.3%, $\chi^2(1) = 15.59$, $p < .001$). Results for the second-chance

choice demonstrated the same pattern (67.9% vs. 39.4%, $\chi^2(1) = 9.84$, $p < .001$). Dialectical thinking had no effect on either choice ($ps > .10$).

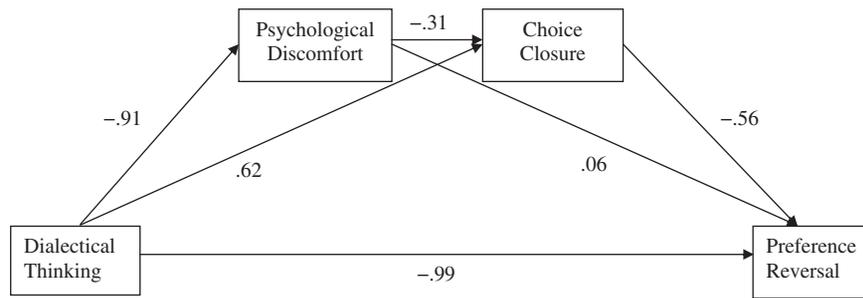
Next, we calculated a preference reversal index for each participant (1 = if they chose differently, 0 = if they did not). As shown in Table 1, after making a choice based on bivalent evaluations of the hotel, dialectical thinkers were less likely to choose differently than nondialectical thinkers were ($M_{\text{dialectical}} = 21.2\%$, $M_{\text{nondialectical}} = 51.5\%$; $\chi^2(1) = 6.55$, $p = .010$). When the choice was based on only positive evaluations, there were no differences in preference reversal ($M_{\text{dialectical}} = 18.5\%$, $M_{\text{nondialectical}} = 20.7\%$, $\chi^2(1) = .42$, $p = .838$). Thus, we found support for H_{5a} but not for H_{5b} , which is discussed below.

Mediating process. First, we used the full sample ($n = 239$) to test the dialectical thinking \rightarrow psychological discomfort \rightarrow choice closure mediating process, with attitudinal ambivalence as the moderator on psychological discomfort. Results indicated that the mediating role of psychological discomfort was significantly positive when participants held bivalent evaluations of the hotel (95% CI = [.04, .32]) and it was negative when they held only positive evaluations (95% CI = [-.28, -.04]). These findings confirmed the mediating effect of psychological discomfort on choice closure for both dialectical and nondialectical thinkers.

H_6 proposed a sequential mediating process in which psychological discomfort and subsequent choice closure mediated the effect of dialectical thinking on preference reversal. As preference reversal was found for participants holding bivalent evaluations only, we tested the proposed sequential mediating process ($n = 66$) for this condition using the bootstrapping approach (Hayes, 2013). Results suggested that the dialectical thinking \rightarrow psychological discomfort \rightarrow choice closure \rightarrow preference reversal mediation was significant (95% CI = [-.66, -.02]). Thus, H_6 was supported when consumers made a choice based on bivalent evaluations. As for the other mediating processes (see Fig. 4), they were both negative; however, their 95% confidence interval included zero (for dialectical thinking \rightarrow psychological discomfort \rightarrow preference reversal mediation, 95% CI = [-.79, .54]; for the dialectical thinking \rightarrow choice closure \rightarrow preference reversal mediation, 95% CI = [-1.43, .01]). Therefore, while in the predicted direction, the other mediating processes were relatively weaker than the sequential mediating process we proposed.

Discussion

Study 4 showed the consequences of psychological discomfort on consumers' preference reversal when they had the chance to choose again. The results suggested that dialectical thinkers were less likely to change their minds than nondialectical thinkers when making a choice based on bivalent evaluations of the focal product. This was because dialectical thinking led to lower psychological discomfort and, thus, a higher sense of choice closure, which in turn reduced the likelihood of preference reversal.



Indirect effect 1: dialectical thinking → psychological discomfort → preference reversal.
Effect = $-.06$, SE = $.32$, LLCI = $-.79$, ULCI = $.54$.

Indirect effect 2: dialectical thinking → psychological discomfort → choice closure → preference reversal.
Effect = $-.15$, SE = $.15$, LLCI = $-.66$, ULCI = $-.02$.

Indirect effect 3: dialectical thinking → choice closure → preference reversal.
Effect = $-.34$, SE = $.33$, LLCI = -1.43 , ULCI = $.01$.

Fig. 4. The sequential mediating roles of psychological discomfort and choice closure in the effect of dialectical thinking on preference reversal (Study 4).

In contrast, dialectical thinking heightened psychological discomfort and thus decreased choice closure when consumers made a choice based on only positive evaluations of the focal product. However, dialectical and nondialectical thinkers did not differ significantly in their likelihood of preference reversal when they had the chance to choose again. A possible explanation for this null effect was that in the positive condition, without new information that contradicted their original choices, lower closure would not lead to preference reversal.

General discussion

Across four studies, we show the effect of dialectical thinking on consumers' psychological discomfort in decision making under different levels of ambivalence toward a focal product. Compared to nondialectical thinkers, dialectical thinkers experience less psychological discomfort when they hold bivalent evaluations of the focal product but more discomfort when they hold only positive evaluations. These results are robust when we prime dialectical thinking in Western (Study 1) and East Asian samples (Studies 2–4). We also investigate the underlying process by showing that uncertainty about choice correctness mediates this interactive effect.

We note that Studies 1 and 2 show only directional support for the simple effect of dialectical thinking on psychological discomfort under different levels of attitudinal ambivalence. To clarify this effect further, we performed a meta-analysis using all the estimates in the four studies (Tuk, Zhang, & Sweldens, 2015). Following Cumming's (2014) recommendations, we used the comprehensive program of Borenstein, Hedges, Higgins, and Rothstein (2009) to calculate the size and 95% confidence interval for the effect of dialectical thinking on psychological discomfort in the bivalent and positive conditions separately. Results showed that in the bivalent condition, the averaged corrected standardized mean difference for the effect of

dialectical thinking was Cohen's $d = -.58$, 95% CI = $[-.81, -.35]$, $Z = -4.88$, $p < .001$. In the positive condition, the averaged corrected standardized mean difference for this effect was Cohen's $d = .51$, 95% CI = $[.30, .72]$, $Z = 4.70$, $p < .001$. These results confirmed the proposed effects. For the effect of ambivalence on discomfort, we also found support for both dialectical (Cohen's $d = -.55$, 95% CI = $[-.77, -.32]$, $Z = -4.80$, $p < .001$) and nondialectical thinkers (Cohen's $d = .72$, 95% CI = $[.50, .96]$, $Z = 6.15$, $p < .001$), but in opposite directions (the forest plots are shown in Appendix G).

Furthermore, we explore the downstream effects of psychological discomfort on choice deferral in a free choice context and on preference reversal in a forced choice context. We show that dialectical thinking decreases choice deferral when consumers hold bivalent evaluations of the focal product, but increases choice deferral when they hold only positive evaluations. These effects are mediated by psychological discomfort (Study 3). In addition, dialectical thinking decreases the likelihood of preference reversal when consumers are forced to make a choice based on bivalent evaluations and are provided with another chance to choose again. This effect is sequentially mediated by psychological discomfort and choice closure (Study 4).

Theoretical and managerial implications

To date, there is limited research examining the effect of dialectical thinking on consumers' affective and behavioral responses as a function of varying levels of ambivalence. The closest work is by Wang et al. (2016), who examine the moderating role of dialectical thinking on consumers' affective reactions to positive only, mixed, and negative only product information. Our research differs from, and thus extends, their work in the following ways.

First, Wang et al. (2016) focus on a judgment context, whereas we examine the effect of dialectical thinking in a choice context. According to Hogarth (1981), judgment is noncommittal, but choice entails commitment to one side of the bivalent evaluations. The different contexts may well explain the differences between our study and Wang et al.'s (2016). Wang et al. (2016) find that nondialectical thinkers experience more discomfort when they are confronted only with positive evaluations than when they are confronted with bivalent evaluations, and that dialectical thinkers do not experience this result. We replicate the results for nondialectical thinkers but show that positive evaluations result in more discomfort than bivalent evaluations for dialectical thinkers (see our meta-analyses results). The mediation test reveals that the presence of only positive evaluations leads dialectical thinkers to perceive the available information as incomplete, thus increasing their uncertainty about the correctness of their choice. The perceived incompleteness of the information may have a smaller effect on uncertainty about a judgment than uncertainty about a choice, as consumers can “sit on the fence” when making judgments. This explanation accords with previous research showing that ambivalence-induced discomfort is more likely to occur in the choice context than in the judgment context (van Harreveld et al., 2009).

Second, Wang et al. (2016) show that felt ambivalence (i.e., contradictory feelings toward the focal product) mediates the effect of information valence on psychological discomfort. In contrast, we show that consumers' uncertainty about whether they will make the correct choice mediates the effect of dialectical thinking on decision-associated discomfort. Prior research has examined this mediating process when consumers hold bivalent evaluations of the focal product (van Harreveld et al., 2009). Our research extends this process to the positive condition. Moreover, we suggest that in this condition uncertainty about choice correctness is influenced by perceived incompleteness of the available product information.

Third, Wang et al. (2016) investigate the effect of dialectical thinking and information valence on psychological discomfort only. We extend their work by showing the consequences of psychological discomfort on consumers' behavioral intentions, specifically choice deferral and preference reversal. Furthermore, prior research largely examined the implication of decision-associated negative emotion on one-time forced choices (Luce et al., 1999; Nowlis et al., 2002). We expand the implications of this negative emotion to situations in which consumers can choose again after making an initial choice.

Last, our research enables comparisons between consumers' reactions to product information of the same valence in distinct markets (e.g., China and the United States), which arguably has greater practical relevance than understanding consumer reactions to product information of different valences (Wang et al., 2016). Practical considerations also lead us to focus on the comparison between mixed and positive only information, omitting the negative only information. Firms increasingly consider word of mouth communication to be a new element of the marketing mix, and use it strategically to promote products (Dellarocas, 2006; Mayzlin, 2006). Our finding that positive only evaluations are not always beneficial to firms has novel

implications on managing consumers' word of mouth communication in different markets.

All in all, the present research deepens our understanding of the effect of dialectical thinking on consumers' affective reactions to different levels of attitudinal ambivalence, in terms of its context, process, downstream effects, and managerial implications.

Directions for future research

We acknowledge several limitations in our research that provide opportunities for future research. First, the dependent variables in our research pertain to behavioral intentions, without actual purchases. Future research could examine whether the effects observed in this research will translate into actual behaviors. Second, for ambivalent conditions, previous research documents the impact of decision-associated negative emotion in the contexts of both free and forced choices (Dhar, 1997a; Luce, 1998; Luce et al., 1999; Nowlis et al., 2002). Our research confirms the effect of dialectical thinking on choice deferral in the free choice setting. However, when the choice is forced, we find that psychological discomfort has no effect on consumers' decision to take or forgo the focal product. This result might be due to the similar levels of importance of the positive and negative attributes in the reviews, as well as the particular scenarios in this research in which the target product was on sale for a limited time. Future research could vary the importance of product attributes and relax the time frame to explore the impact of dialectical thinking on choice outcomes further.

Last, our finding that dialectical thinking increases psychological discomfort when consumers make a choice based on only positive evaluations of the focal product is new to the literature. Exploring the factors that amplify or mitigate this effect is a promising avenue for future research. In this study, we find that the amount of product information does not moderate the results, and future research could explore other potential moderators, such as the source and content of the product information.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <http://dx.doi.org/10.1016/j.jcps.2016.10.001>.

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