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Evaluating the Influence of Metaphor in News on Foreign-Policy Support

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Metaphors are often used for presenting government policy to the general public in news, but the degree to which metaphors affect evaluation of such policies is not well understood. We conducted three between-subjects experiments ($N_{\text{experiment–1}}$ = 331; $N_{\text{experiment–2}}$ = 301; $N_{\text{experiment–3}}$ = 608), in which participants read news items about foreign policies. News items contained either (a) novel metaphors, (b) conventional metaphors, or (c) literal controls. Results demonstrated that novel metaphors increased cognitive text perceptions, which led participants to evaluate proposed policies more favorably in a longer passage (Experiment 1) but not in a shorter passage with a larger percentage of metaphors (Experiments 2 and 3). By contrast, Experiments 2 and 3 showed a sequential indirect effect of novel metaphors (vs. controls) through perceived novelty and affective text perceptions on policy support. These results demonstrate that novel metaphors are helpful to readers processing texts about new topics as they draw attention to the language with their novelty, but remain familiar enough to generate positive affect.

Keywords: political communication, metaphor, cognitive text perception, affective text perception, foreign policy

Metaphors are cross-domain mappings (Lakoff & Johnson, 1980) that play a role in reasoning and decision making (Keefer & Landau, 2016). For instance, talking about illness in terms of a war carries elements from the source domain of WAR onto the target domain of ILLNESS (Boylstein, Rittman, & Hinojosa,

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2007), impacting decisions made by patients (Semino, Demjén, & Demmen, 2018).[2] Metaphors often imply specific positions regarding the topics being discussed. For instance, the ILLNESS IS WAR metaphor frames the disease in such a way that an illness is seen as a battle to be fought. Such metaphorical frames suggest certain mappings, and thereby serve as a frame of a specific topic (Burgers, Konijn, & Steen, 2016). Furthermore, metaphorical frames can have different effects, depending on the context in which they are used. For instance, use of the ILLNESS IS WAR metaphor has been linked to a more positive perception of patients (Bowers, Nosek, & Moyer, 2022), but has also been linked to an increase in fatalistic beliefs (Hauser & Schwarz, 2019) and patient depression (Boylstein et al., 2007). In some cases, the ILLNESS IS WAR metaphor has even been actively resisted (Wackers, Plug, & Steen, 2020).

Previous research has examined whether and how metaphors impact persuasion (Robins & Mayer, 2000). Various meta-analyses have demonstrated that compared with literal formulations, metaphors increase persuasion although effects are statistically small and heterogeneous (Brugman, Burgers, & Vis, 2019; Sopory & Dillard, 2002; Van Stee, 2018). This heterogeneity indicates that effects may differ among metaphors across contexts and populations. In some cases, metaphors were found to be persuasive (Brown, Keefer, Sacco, & Bermond, 2019; Legein et al., 2018), while in other cases, metaphors did not impact persuasion (Burgers, Konijn, Steen, & Iepsma,2015), or even reduced the persuasiveness of a text (Hart, 2021; Hauser & Schwarz, 2019).

In the current article, we propose that effects of metaphor on persuasion may depend on (1) aspects of the metaphor itself, (2) underlying processes that may be activated (or not), and (3) contextual aspects (see also Brugman et al., 2019). This perspective to move away from direct effects and focus more on indirect effects has been explicated in the differential susceptibility to media effects model (DSMM; Valkenburg & Peter, 2013). According to the logic of the DSMM, we should not ask *whether* metaphors are persuasive, but rather *when, how,* and *for whom* metaphors may be persuasive (or not). In this article, we focus on novelty of the metaphor because it has received prior attention in the communication-scientific literature (Boeynaems, Burgers, Konijn, & Steen, 2017; Jansen, van Nistelrooij, Olislagers, van Sambeek, & de Stadler, 2010). In the following sections, we examine *when* and *how* novelty may impact a metaphor's persuasiveness and present empirical data from three experiments to test our hypotheses.

Effects of Conventional and Novel Metaphors on Policy Support

Novelty is an important message feature to distinguish different metaphor types. Comprehension of conventional metaphors such as "trapped in war" typically occurs via conceptual mappings (i.e., as part of a conceptual metaphor such as WAR IS A CONTAINER) rather than via ad hoc comparisons. After all, processing preexisting mappings between a source domain and a target domain is faster and less cognitively intensive (Ahrens, 2010) than mentally constructing a new ad hoc comparison between the two domains. By contrast, novel metaphorical expressions, such as "entangled in war" are not conventionalized. Novel metaphors may occur as a result of novel source-target domain pairings (Ahrens et al., 2007) or as a result of new lexemes being mapped between already existing source and target domain pairings (Ahrens, 2010).

[2] Following conventions in conceptual metaphor theory (Lakoff & Johnson, 1980), source and target domains are written in small capitals.

In this study, it is this latter type of novel metaphor whereby a new lexeme (e.g., "entangled") is used based on a conceptual metaphor (e.g., WAR IS A CONTAINER) and contrasted with a conventionally mapped lexeme (e.g., "trapped") for the same conceptual metaphor.

In the literature, different mechanisms have been proposed to explain the persuasiveness of novel and conventional metaphors. Conventional metaphors have been hypothesized as mainly influencing cognitive text perceptions through increasing perceived argument quality (Hartman, 2012) and decreasing perceived message complexity (Burgers et al., 2015). By contrast, novel metaphors can impact affective text perceptions such as message attractiveness (Jansen et al., 2010) and pleasure (Hoeken, Swanepoel, Saal, & Jansen, 2009). Effects of conventional and novel metaphors on people's viewpoints via either cognitive or affective text perceptions were further tested by Boeynaems and associates (2017), who did not find direct effects, but found indirect effects for novel metaphors positively influencing cognitive and affective text perceptions. Novel metaphors via metaphor aptness also influenced cognitive text perceptions, but negatively.

Novel metaphors are hypothesized to be persuasive through an experiential processing route (Meyers-Levy & Malaviya, 1999). They are typically seen as small riddles that recipients need to solve to understand the message (Dehay & Landwehr, 2019; Hoeken et al., 2009). Solving this riddle may provide a pleasurable experience, which may then be projected onto the message content (Hoeken et al., 2009). In other words, a positive attitude toward the message may, in turn, result in a positive attitude toward the persuasive topic. Advertising research in particular demonstrates that novel metaphors can indeed boost persuasiveness through increasing affective perceptions of advertisements (e.g., Meijers, Remmelswaal, & Wonneberger, 2019; Myers & Jung, 2019). However, this does not apply to all novel metaphors, because in some cases, novel metaphors in advertising had no effect on message attractiveness (Jansen et al., 2010) or were outperformed by literal messages (Van Stee, Noar, Harrington, & Grant, 2018). Nevertheless, as most studies have found that novel metaphors lead to more positive affect (e.g., Meijers et al., 2019; Myers & Jung, 2019), we expect to replicate the effects of novel metaphors on affective text perceptions in the current study, leading to the first hypothesis:

H1: Novel metaphors increase affective text perception, compared with (a) conventional metaphors and (b) nonmetaphorical expressions.

Conventional metaphors typically work via a different processing mechanism. A conventional metaphor can serve to make a complex, abstract issue more comprehensible. For instance, when referring to the storage capacity of an e-reader, a literal description mentioning the number of gigabytes is, in many cases, more complex than a conventional metaphor, indicating that the e-reader can store a library of books (Burgers et al., 2015). Furthermore, for people with relatively little knowledge of the topic at hand, a conventional metaphor can serve as a clarification and even increase perceptions of argument quality (Hartman, 2012). Thus, conventional metaphors can decrease the complexity of a message and allow for greater clarity. This leads to the second hypothesis:

H2: Conventional metaphors increase cognitive text perception, compared with (a) novel metaphors and (b) nonmetaphorical expressions.

Effects of conventional and novel metaphors on policy support (defined in this article as related to policy agreement and policy evaluation) via either cognitive or affective text perception were first tested by Boeynaems and colleagues (2017). Contrary to expectations, they found no direct effects of metaphors on cognitive or affective text perception, or on persuasion. They did find indirect effects, demonstrating that novel metaphors increased perceived novelty, which, in turn, positively impacted affective and cognitive text perceptions. Furthermore, they also found that novel metaphors decreased perceived aptness, which in turn, reduced cognitive text perceptions (Boeynaems et al., 2017). Boeynaems and associates(2017) postulated that the lack of direct effects may have been due to the stimulus manipulation being too subtle: Metaphors only consisted of 1.7% of the total number of words, and metaphor variation was only presented in the beginning and ending of the texts.

Findings from the work by Boeynaems and colleagues (2017) suggest that even though they did not find effects of metaphors on persuasion, such effects may be found when metaphors are more prominently present in the text. Following previous literature, we propose that affective text perception may be the processing mechanism responsible for effects of novel metaphors and that cognitive text perception may be the processing mechanism underlying effects of conventional metaphors. Thus, we propose the following:

H3: Novel metaphors (vs. conventional metaphors and literal controls) increase affective text perceptions, which, in turn, increase policy support.

H4: Conventional metaphors (vs. novel metaphors and literal controls) increase cognitive text perceptions, which, in turn, increase policy support.

We tested our hypotheses in three experiments in which participants were asked to read an op-ed piece about a specific political policy that was framed with either novel metaphors, conventional metaphors, or nonmetaphorical expressions. Subsequently, participants were asked whether they agreed with the position advocated in the op-ed. In Experiment 1, the op-ed was relatively long (with 310 words), while in Experiments 2 and 3, the op-ed was much shorter (with 159 words), which allowed us to see if stimulus length and associated ratio of metaphorical expressions to the total number of words impacted affective and cognitive text perceptions and/or policy support.

Experiment 1

Method[3]

Design and Materials

A fictional *New York Times* op-ed was created, arguing for the United Nations (U.N.) intervening in a conflict between two fictitious countries (Ganin and Zamibia). In a between-subjects design, participants were randomly assigned to read the editorial in one of three experimental conditions, including either (a) conventional metaphors, (b) novel metaphors, or (c) nonmetaphorical expressions. Target expressions were mainly used to highlight the conflict and tension between the two countries, and the possible consequences if action was taken. For each target expression, the novel and conventional metaphors were taken from the same conceptual metaphors (i.e., the same source and target pairings) and matched with a literal control condition. Target expressions were determined to be metaphorical or literal following the metaphor identification procedure Vrije Universiteit (MIPVU; Steen et al., 2010) and, if metaphorical, were determined to be associated with a given source domain following current source domain verification procedures (Ahrens & Jiang, 2020). During the process of stimulus creation, we searched within Google News, as a rough guideline, to estimate the relative frequency of the expressions in news texts (Boeynaems et al., 2017; Pierce & Chiappe, 2008; Thibodeau & Durgin, 2011) to assist the writer in checking her intution about the potential degree of novelty of the metaphors created.[4] We also ran pretests (discussed below) to ensure that this estimate of difference in degree of novelty was verified with behavioral data before running both main studies. In this passage, metaphorical phrases comprised 6.9% of the total 310 words and occurred in five of 12 sentences. For example, one of the target sentences referred the WAR IS A TRAP metaphor, in which, depending on experimental condition, participants read that an "entire region would be *trapped* (conventional metaphor), *entangled* (novel metaphor) or *involved* (literal) in war." Digital Appendix A (https://osf.io/gh4q9/) contains the full stimulus text and an overview of manipulated target sentences.

Pretest

Before running Experiment 1, we conducted a small pretest (N = 60), in which we tested whether participants perceived the phrases with novel metaphors as being more novel than the phrases with conventional metaphors and whether all three conditions were equally apt (Pierce & Chiappe, 2008). Based on the results of the pretest, we optimized the materials. We conducted a small pretest (N = 60) to test whether participants perceived phrases with novel metaphors as more novel than phrases with conventional

[3] All three experiments in this study were conducted in accordance with the Human Subjects Ethics Sub-committee (HSESC) (or its Delegate) of The Hong Kong Polytechnic University (HSESC Reference Number: HSEARS20200224003).

[4] We limited the search to Google News as the stimulus material was a fictitious option article in a newspaper. In addition, we restricted the search to exact phrases that were not proper nouns by using quotation marks around each phrase and excluding capitalized expressions.

metaphors and whether the novel and conventional metaphor phrases were equally acceptable. A complete description of the pretest can be found in Digital Appendix B (https://osf.io/gh4q9/).

Participants

We *a priori* determined that we wanted to have at least 100 participants per condition. To reach this goal, a total of 458 participants on Amazon's Mechanical Turk (http://www.mturk.com) were recruited. They were rewarded with U.S. $1.50 in exchange for participation. We used Mechanical Turk's inclusion function to ensure that the participants were located in the United States, had a HIT approval rate greater than 95%,[5] and had never participated in any of our similar studies. We *a priori* determined to screen the participants to (1) ensure that they were native speakers of English and (2) ensure that they were U.S. citizens or permanent residents, (3) determine whether they had spent a reasonable amount of time on the survey (less than 30 minutes), and (4) determine whether they could provide all the three keywords correctly from the stimulus materials with only minor typos allowed.[6] After using the above criteria, we screened out 127 unqualified results; hence 331 responses remained: Conventional metaphor condition (n = 111), novel metaphor condition (n = 107), and literal control condition (n = 113).

Among the 331 participants, 205 were male (61.9%), 123 were female (37.2%), and three selected "other" as their gender identity (0.9%). Their average age was 37.08 years (SD = 10.79, range = 20–65 years). Most participants reported their political affiliation as Democrats (157 participants, 47.4%), followed by Republicans (96 participants, 29.0%) and Independents (76 participants, 23%). Two participants (0.7%) had different political affiliations (Libertarian, and the other without any political affiliation).

Procedure and Measures

Participants independently selected our survey on Amazon Mechanical Turk. After providing informed consent and reading the instructions, participants read the stimulus text in one of the three conditions on the online survey platform SurveyMonkey (https://www.surveymonkey.com/).

Once participants indicated that they read the materials, they were asked to provide three keywords from the text. This question served as a reading check to determine whether participants had indeed read the text. Next, we measured four main variables on 7-point Likert scales (1 = *strongly disagree*, 7 = *strongly agree*). The first question, which was on *policy agreement*, was as follows: The United Nations should send in multinational troops to Ganin and Zamibia. Next, we measured *cognitive text perception*, using Sundar's (1999) seven-item text quality scale, asking participants if they found the text to be (1) accurate, (2) believable, (3) comprehensive, (4) clear, (5) coherent, (6) concise, and (7) well-written (Cronbach's α = .80). *Affective text perception* was tapped using a five-item scale for text liking (Sundar, 1999). Participants were asked to indicate whether they found the text (1) enjoyable, (2) interesting, (3) boring (reverse coded), (4) lively, and (5) pleasing (Cronbach's α = .74). We measured *policy evaluation* through a four-item scale adapted from the work by Boeynaems and colleagues (2017) by asking

[5] A HIT approval rate means the proportion of completed tasks that are approved by requesters.
[6] Both pre-tests screened for (1)–(3). The two main studies screened for (1)–(4).

participants whether they thought that the proposed policy of U.N. intervention in Ganin and Zamibia was (1) favorable for the United States, (2) unnecessary for the United States (reverse coded), (3) negative for the United States (reverse coded), and (4) a good idea for the United States (Cronbach's α = .81).

Next, we asked questions on *perceived novelty* (1= *very conventional*, 7 = *very novel*, based on Boeynaems et al., 2017) and *perceived aptness* (1 = *very inappropriate*, 7 = *very appropriate*, based on Pierce & Chiappe, 2008). Participants rated novelty and aptness for each of the five target expressions, and we planned to collapse these ratings into one scale (Cronbach's $\alpha_{novelty}$ = .62; Cronbach's $\alpha_{aptness}$ = .74). However, in this experiment, the Cronbach's α of perceived novelty was too low to take the items together into one scale, so we did not include this variable in our analyses for Experiment 1.[7]

In addition, four reading comprehension questions, labeled as *knowledge* (0 = *no answers correct*, 1 = *all answers correct*) in later analyses, were used to check how well participants understood the passage. The following questions were used: (1) the article mentions militants attacking civilians (False); (2) the article notes that Ganin and Zamibia share a border (True); (3) the article mentions that the mining sites are running out of minerals (False); and (4) the article notes that satellites are critically needed to simulate war games (False).

Demographic questions regarding participants' gender, age, language and citizenship background, and political affiliations were asked at the end of the survey. Next, participants were thanked for participation, informed that the article they had read and the countries mentioned in the article were fictional, and received a completion code to collect their reward on Mechanical Turk.

Results

Control Analyses

Before testing our hypotheses, we first ran three checks. First, we found that, overall, time spent did not differ across the experimental conditions, $F(2, 328) = 1.084$, $p = .340$, $\eta^2_p = .007$. Second, aptness did not differ across experimental conditions, $F(2, 328) = 2.340$, $p = .098$, $\eta^2_p = .014$. Third, we found no effect of the experimental condition on knowledge, $F(2, 328) = .140$, $p = .869$, $\eta^2_p = .001$. Average scores

[7] We did run single-factor (type of experimental condition: Conventional metaphor, novel metaphor, literal control) between-subjects multivariate analysis of variance (MANOVA) with the novelty scores of each of the five target sentences as dependent variables. Although a significant multivariate effect of metaphor type was shown, Pillai's trace = .188, $F(10, 650) = 6.757$, $p < .001$, $\eta^2_p = .094$, metaphors were perceived as more novel than the literal controls in only three of five sentences. Also, novel metaphors were perceived as more novel than conventional metaphors in only two of five sentences. This is different from what we found in the pretest, where all five novel stimuli were more novel than either all the conventional or literal control stimuli. In the pretest, we presented these stimuli in isolation, which meant that participants only saw the metaphorical phrases, but in the main study, participants saw the metaphors in context. Thus, it could be the context that made the metaphors slightly easier to comprehend.

and standard deviations of measured variables across the three conditions are presented in Table 1. Data, scripts, and output are available on OSF at https://osf.io/gh4q9/.

Table 1. Means (and Standard Deviations) of Dependent Variables Across Experimental Conditions in Experiment 1.

	Experimental Condition		
	Conventional Metaphor (n = 111)	Novel Metaphor (n = 107)	Literal Condition (n = 103)
Participation time	7.54 (4.10)	6.91 (3.39)	6.81 (4.47)
Perceived aptness	4.86 (1.06)	5.11 (0.98)	4.85 (0.98)
Knowledge	0.80 (0.24)	0.79 (0.26)	0.80 (0.24)
Affective text perception	4.56 (1.10)	4.70 (1.11)	4.44 (1.04)
Cognitive text perception	5.45 (0.78)[a,b]	5.63 (0.75)[a]	5.28 (0.85)[b]
Policy agreement	5.65 (1.11)	5.36 (1.40)	5.27 (1.28)
Policy evaluation	5.09 (1.09)	4.91 (1.24)	4.75 (1.13)

Note. [a,b]Means of variables with different superscripts are significantly different according to pairwise comparisons with a certainty of at least $p < .01$ Standard deviations are given in parentheses. All variables except for participation time and knowledge were measured on 7-point scales, with 7 indicating higher aptness, cognitive text perception, and affective text perception, more policy agreement, and a more positive policy evaluation. Participation time was measured in minutes. Knowledge was measured from 0 to 1, with 1 being the maximum score.

Hypothesis Testing

Next, we tested our hypotheses. *H1* predicted that novel metaphors would increase affective text perception compared with conventional metaphors and literal expressions, while *H2* hypothesized that conventional metaphors (vs. novel metaphors and literal expressions) would increase cognitive text perception. To test both hypotheses, we ran a single-factor (type of experimental condition: Conventional metaphor, novel metaphor, literal control) between-subjects MANOVA with affective and cognitive text perception as dependent variables. This analysis revealed a significant main effect of experimental condition on text perception, Pillai's trace = .032, $F(4, 656) = 2.67$, $p = .031$, $\eta^2_p = .016$. Subsequent univariate analyses revealed no effect of metaphors on affective text perceptions ($F(2, 328) = 1.61$, $p = .20$, $\eta^2_p = .010$), indicating that *H1* was not supported. However, we did find a main effect of condition on cognitive text perceptions, $F(2, 328) = 5.43$, $p = .005$, $\eta^2_p = .032$. Pairwise comparisons with Bonferroni corrections demonstrated that, in contrast to *H2*, cognitive text perception was higher for the text with novel metaphors compared with cognitive text perception for the literal control text ($p = .003$). All other comparisons were nonsignificant (novel vs. conventional metaphors: $p = .248$; conventional metaphor vs. literal control: $p = .358$). Given that *H1* and *H2* were not supported by the data, we could not further test *H3* and *H4*, which assumed an indirect effect of novel metaphors on policy support through affective text perceptions (*H3*) and an indirect effect of conventional metaphors on policy support through cognitive text perception (*H4*).

Exploratory Analyses

We followed up our hypothesis testing with various exploratory analyses. First, we ran a single-factor (type of experimental condition: Conventional metaphor, novel metaphor, literal control) between-subjects MANOVA with policy evaluation and policy agreement as dependent variables. This analysis revealed no direct effects of metaphor on policy support, Pillai's trace = .021, $F(4, 656) = 1.74$, $p = .14$, $\eta_p^2 = .010$. Subsequently, we conducted correlation analyses (see Digital Appendix C for the correlation table, https://osf.io/gh4q9/).

The correlation analyses demonstrated that cognitive text perception was correlated to both policy agreement and policy evaluation. This allowed us to test whether our unexpected effect of novel metaphor on cognitive text perception was related to policy support. We conducted two indirect effects analyses using the process macro for SPSS v3.3 (Hayes, 2018; 5,000 bootstrap samples, model 4). We explored the indirect effects of conventional and novel metaphors on policy agreement (Figure 1) and policy evaluation (Figure 2) through cognitive text perception. As indicated in Figure 1, we found an indirect effect of novel metaphor (vs. literal control) via cognitive text perception on policy agreement: $b = 0.20$, $SE = 0.07$, 95% CI [0.07, 0.36]. However, no indirect effect was found for conventional metaphor (vs. literal control) on policy agreement via cognitive text perception: $b = 0.09$, $SE = 0.07$, 95% CI [−0.02, 0.23].

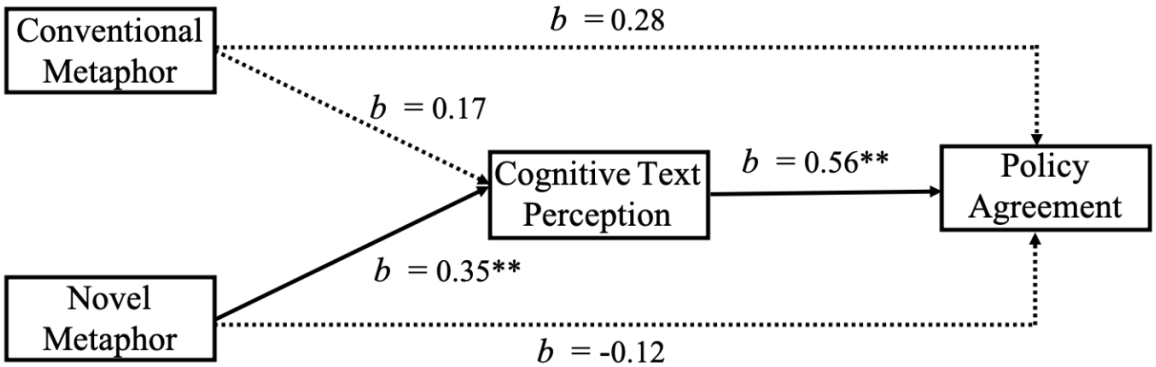

Figure 1. Indirect effects of novel metaphor on policy agreement, through cognitive text quality.

Note. The literal control condition served as a baseline. Solid lines indicate a significant relation; dotted lines indicate a nonsignificant relation. *Significant at $p < .05$, **significant at $p < .01$.

Figure 2 shows the relative indirect effect of novel metaphor (vs. literal control) on policy evaluation via cognitive text perception: $b = 0.16$, $SE = 0.06$, 95% CI [0.06, 0.29]. Again, no indirect effect of conventional metaphor (vs. literal control) on policy evaluation via cognitive text perception was found, $b = 0.07$, $SE = .05$, 95% CI [−0.02, 0.19].

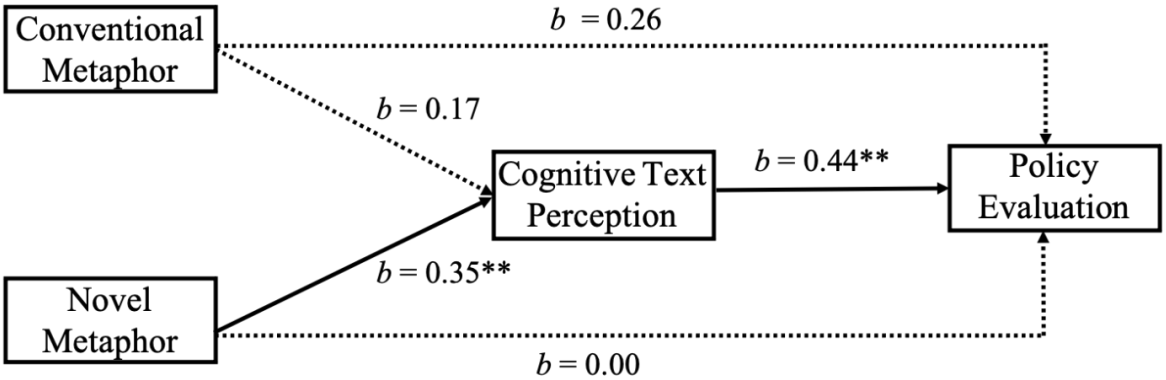

Figure 2. Indirect effects of novel metaphor on policy evaluation, through cognitive text quality.

Note. The literal control condition served as a baseline. Solid lines indicate a significant relation; dotted lines indicate a nonsignificant relation. *Significant at $p < .05$, **significant at $p < .01$.

The indirect effects analyses suggested that novel metaphors increased cognitive text perception, which in turn, made people agree more with the policy and evaluate the policy more favorably.

Interim Discussion

None of our hypotheses was supported in Experiment 1. In contrast to *H1*, we found no significant effect of novel metaphors on affective text perceptions. Given that previous studies that found effects of novel metaphors on affective text perception were in the advertising field (e.g., Meijers et al., 2019; Myers & Jung, 2019), there may be unique conditions to these novel advertising metaphors, including the fact that they primarily use (and test) cross-modal metaphors (i.e., metaphors that encompass visual and textual information), as compared with only textual information in the current study. *H2* predicted that conventional metaphors would boost cognitive text perceptions. However, results demonstrated that, contrary to expectations, novel metaphors increased cognitive text perception. Thus, these novel metaphors may be functioning to make a complex issue more comprehensible without adding additional processing load. We also found no direct effect of metaphor on policy support. However, the indirect-effect analyses showed that novel metaphors (vs. nonmetaphorical expressions) impacted policy support through cognitive text perception. That is, compared with nonmetaphorical expressions, novel metaphors increased cognitive text perception, which, in turn, increased policy support.

Note that the indirect effects we found were statistically small. In addition, while the percentage of metaphorical words in the stimulus text was 6.9% in Experiment 1 (as compared with only 1.7% in Boeynaems et al., 2017), we did not find a direct effect of novel metaphors on affective text perception as predicted. Therefore, to further unravel the effects of novelty of metaphors in policy support and to further examine the findings from Experiment 1, we conducted a second experiment, with an increase in the percentage of metaphors used in the text.

Experiment 2

Method

Materials and Pretest

In Experiment 2, we shortened the passage and changed the first two metaphorical manipulations to ensure text continuity. The metaphorical phrases comprised 13.4% of the total of 159 words and were found in five of seven sentences in the passage. We again conducted a small pretest (N = 75) to test whether participants perceived phrases with novel metaphors as more novel than phrases with conventional metaphors and whether the novel and conventional metaphor phrases were equally acceptable (see Digital Appendix B for details). Digital Appendix D (https://osf.io/gh4g9/) contains the full stimulus text and an overview of manipulated target sentences.

Procedure and Measures

Experiment 2 followed similar procedures and measures to Experiment 1, including the questions on policy agreement, cognitive text perception (Cronbach's α = .82), affective text perception (Cronbach's α = .69), policy evaluation (Cronbach's α = .72), perceived novelty (Cronbach's α = .83), and perceived aptness (Cronbach's α = .78). In contrast with Experiment 1, in Experiment 2, the novelty scale reached acceptable alpha levels.

Since the information in the text might have been relatively unfamiliar to participants and given the shorter length of the article, which made it more difficult to provide context and explanation, we added a question regarding perceived plausibility (Cho, Shen, & Wilson, 2014; Hall, 2003). Plausibility refers to the possibility of behaviors and events in a narrative that could actually happen in real life (Hall, 2003). One study demonstrated that perceived plausibility was a stronger predictor of emotionality, which in turn, can affect persuasion (Cho et al., 2014). Therefore, we tested whether perceived plausibility varied across conditions and whether it affected policy support. Three items on perceived plausibility were included: (1) if major Internet servers around the world are connected with aging underwater cables; (2) rare minerals are needed to manufacture and repair the aging underwater cables; and (3) without the underwater cables, the global Internet system may be critically damaged for years to come (Cronbach's α = .80).

Moreover, in the reading comprehension items, the last question in Experiment 1, (4) The article notes that satellites are critically needed to simulate war games (False), was replaced by (4) The article notes that the underwater cables connect Western African countries (False) in Experiment 2. This was because the satellite-related information was absent in Experiment 2, because the article had been shortened.

Participants

Following similar collection and screening criteria as in Experiment 1, surveys were collected from 457 participants on Mechanical Turk across three conditions, with 174 classified as invalid after applying the

same data screening criteria in Experiment 1, resulting in 301 qualified responses left for further examination: Conditions containing conventional metaphors (n = 103), novel metaphors (n = 96), and literal controls (n = 102).

Of the 301 valid responses, 193 were from male participants (64.1%), 106 were from female participants (35.2%), and two selected "other" as their gender identity (0.7%). Their average age was 36.40 years (SD = 10.65, range = 19–70 years). All participants had grown up speaking English. They were all U.S. citizens or permanent residents. Most participants identified as Democrats (121 participants, 40.2%), followed by Republicans (107 participants, 35.5%) and Independents (69 participants, 22.9%). Four participants (1.3%) had other political affiliations.

Results

Control Analyses

We again ran a number of checks before testing our hypothesis (see Table 2 for means and standard deviations). As in Experiment 1, we found no differences among conditions on time spent filling out the survey ($F(2, 298) = 0.03$, $p = .97$), perceived aptness of the target expressions ($F(2, 298) = 1.29$, $p = .28$), and knowledge ($F(2, 298) = 2.14$, $p = .12$). We also found no differences in experimental condition for perceived plausibility ($F(2, 298) = 0.44$, $p = .65$).

Table 2. Means (and Standard Deviations) of Dependent Variables Across Experimental Conditions in Experiment 2.

	Experimental Condition		
	Conventional Metaphor (n = 103)	Novel Metaphor (n = 96)	Literal Condition (n = 102)
Participation time	7.95 (4.60)	8.00 (4.84)	8.11 (4.32)
Perceived aptness	5.21 (1.07)	5.44 (0.86)	5.30 (1.06)
Knowledge	0.75 (0.24)	0.70 (0.27)	0.77 (0.25)
Perceived plausibility	4.96 (1.31)	5.05 (1.39)	5.13 (1.18)
Perceived novelty	4.06 (1.36)[a]	4.52 (1.21)[b]	3.79 (1.26)[a]
Affective text perception	4.71 (1.05)	4.85 (0.94)	4.72 (1.09)
Cognitive text perception	5.43 (0.85)	5.66 (0.71)	5.53 (0.78)
Policy agreement	5.47 (1.27)	5.59 (1.11)	5.61 (1.18)
Policy evaluation	4.65 (1.09)	4.65 (1.08)	4.86 (1.21)

Note. [a,b] Means of variables with different superscripts are significantly different according to pairwise comparisons with a certainty of at least $p < .01$.
Standard deviations are given in parentheses.
All variables except for participation time and knowledge were measured on a 7-point scale, with 7 indicating higher perceived aptness, plausibility, novelty, cognitive text perception, and affective text perception, more policy agreement, and a more positive policy evaluation. Participation time was measured in minutes. Knowledge was measured from 0 to 1, with 1 being the maximum score.

In contrast, and in line with our expectations, we did find an effect of metaphor on perceived novelty, $F(2, 298) = 8.08$, $p < .001$, $\eta^2_p = .051$. Post hoc tests with Bonferroni corrections revealed that the novel metaphors were rated more novel than the conventional metaphors ($p = .038$) and the literal controls ($p < .001$). The conventional metaphor and literal control conditions did not differ on perceived novelty ($p = .395$).

Hypothesis Testing

We tested our hypotheses in a similar manner to Experiment 1. In contrast to Experiment 1, we found no multivariate effect of metaphor type on affective and cognitive text perceptions, Pillai's trace = .015, $F(4, 596) = 1.15$, $p = .33$. Similarly, we found no significant multivariate main effect of metaphor on policy support, Pillai's trace = .010, $F(4, 596) = 0.75$, $p = .56$. This means that none of our hypotheses were confirmed.

Exploratory Analyses

As in Experiment 1, we conducted various exploratory analyses. We first ran correlation analyses (see Digital Appendix E, https://osf.io/gh4q9/). Subsequently, we conducted indirect effects analyses. Previous research demonstrated that perceived novelty could impact affective and cognitive text perceptions (Boeynaems et al., 2017). Thus, we conducted sequential indirect effects analyses using Hayes (2018) macro for SPSS, v. 3.3 (5,000 bootstrap samples; model 6), involving perceived novelty, text perceptions, and policy support. We found significant indirect effects of novel metaphor (vs. nonmetaphorical messages): Novel metaphors increased perceived novelty, which, in turn, increased affective text perceptions, which led to an increase of policy agreement ($b = 0.05$, $SE = 0.02$, 95% CI [0.01, 0.10], see Figure 3) and policy evaluation ($b = 0.06$, $SE = 0.02$, 95% CI [0.02, 0.11], see Figure 4).

In contrast, we found no indirect effect of conventional metaphors (vs. nonmetaphorical messages) in this indirect effect path ($b = 0.02$, $SE = 0.02$, 95% CI [−0.01, 0.05]) or policy evaluation ($b = 0.02$, $SE = 0.02$, 95% CI [−0.01, 0.06]). This means that, compared with nonmetaphorical expressions, novel metaphors increased perceived novelty, which, in turn, impacted affective text perception, which subsequently boosted policy support. However, we found no indirect effects involving cognitive text perceptions. Thus, these analyses partly replicate and extend results of Boeynaems et al. (2017). We find that, through perceived novelty, novel metaphors increased affective text responses, but not cognitive text responses. This contrasts with the findings from Boeynaems et al.'s (2017) work, in which, through perceived novelty, novel metaphors increased both affective and cognitive text responses.

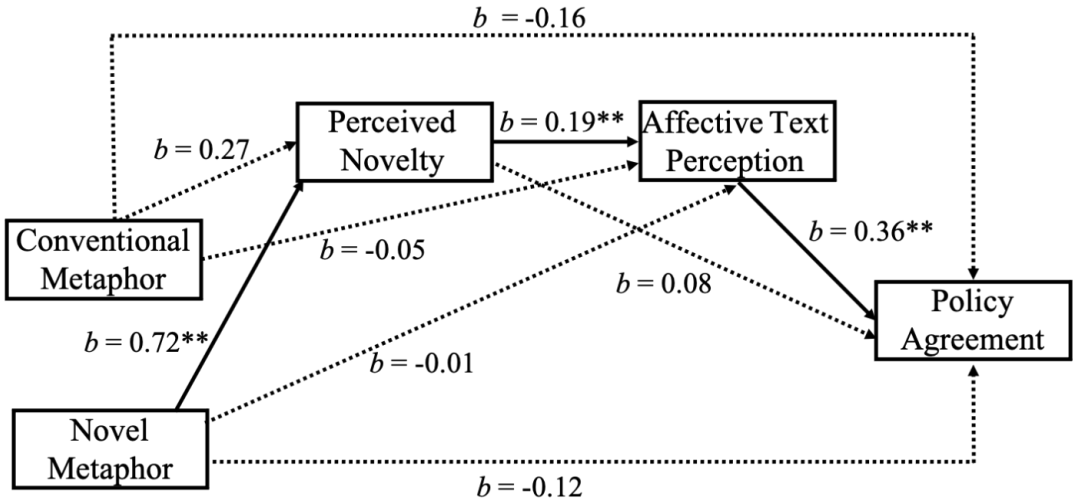

Figure 3. Indirect effects of novel metaphor on policy agreement, through perceived novelty.
Note. The literal control condition served as a baseline. Solid lines indicate a significant relation; dotted lines indicate a nonsignificant relation. *Significant at $p < .05$, **significant at $p < .01$.

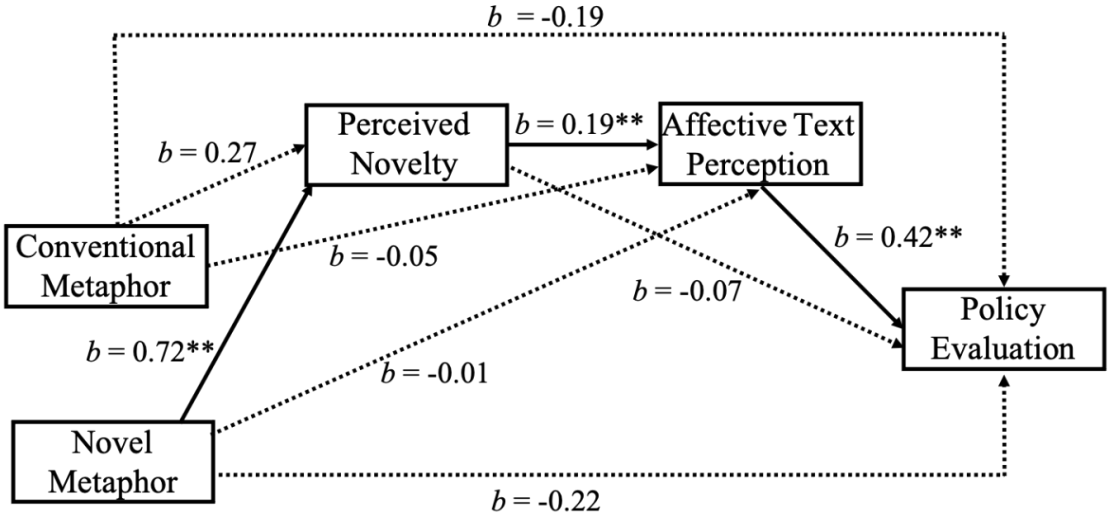

Figure 4. Indirect effects of novel metaphor on policy evaluation, through perceived novelty and then via affective text perception.
Note. The literal control condition served as a baseline. Solid lines indicate a significant relation; dotted lines indicate a nonsignificant relation. *Significant at $p < .05$, **significant at $p < .01$.

Furthermore, our study demonstrates that unlike the study by Boeynaems et al. (2017), the indirect effect through affective text responses also further impacted policy support. These findings demonstrate the importance of including indirect effects to further explicate effects of metaphors on foreign policy issues.

Experiment 3

Method

Experiment 3 is a replication study of Experiment 2. We preregistered this study at https://osf.io/gh4q9/ before running the experiment.[8]

Procedure and Measures

Experiment 3 followed identical procedures and measures to Experiment 2, including the questions on policy agreement, cognitive text perception (Cronbach's α = .84), affective text perception (Cronbach's α = .66), policy evaluation (Cronbach's α = .70), perceived novelty (Cronbach's α = .77), perceived aptness (Cronbach's α = .81), and perceived plausibility (Cronbach's α = .76).

Participants

As discussed in the preregistration report, we needed at least 609 participants in total for the three conditions (i.e., at least 203 participants per condition) according to the sample size guidelines for reaching 0.8 power in mediation analysis (Fritz & MacKinnon, 2007). Surveys were collected from 975 participants on Mechanical Turk across three conditions, with 367 classified as invalid after applying the same data screening criteria in the first two experiments. The valid responses in each condition in the 608 qualified responses are the following: Conventional metaphor condition (n = 203), novel metaphor condition (n = 202), and literal control condition (n = 203).

With regard to the demographic details, 256 participants were male (42.1%), 347 were female (57.1%), and five identified their gender identities as "other" (0.8%). Their average age was 33.61 years (SD = 10.32, range = 18–72 years). All participants had grown up speaking English, either as their only language or as one of the languages they grew up speaking. They were all U.S. citizens or permanent residents. Most participants saw themselves as Democrats (284 participants, 46.7%), followed by Independents (160 participants, 26.3%) and Republicans (138 participants, 22.7%). Twenty-six participants (4.3%) had other political affiliations.

[8] We preregistered and ran one additional study before this one. However, a high rate of random answers was given to our keyword questions, so we did not analyze the data further. To tackle the issue of low-quality responses, we changed the survey platform from SurveyMonkey to Qualtrics (https://www.qualtrics.com/) to be able to automatically screen for participants using a VPN/VPS, and raised the HIT approval rate from greater than 95% in the first two experiments to a rate greater than 99% in this study to improve the quality of responses.

Results

Control Analyses

No differences were found across conditions on time spent filling out the survey ($F(2, 605) = 1.81$, $p = .17$), perceived aptness ($F(2, 605) = 1.64$, $p = .20$), and knowledge ($F(2, 605) = 1.57$, $p = .21$). Similar to Experiment 2, we found an effect of metaphor on perceived novelty, $F(2, 605) = 9.12$, $p = .000$, $\eta^2_p = .029$. Post hoc tests with Bonferroni corrections again revealed that the novel metaphor condition was rated as more novel than the conventional metaphor condition ($p = .001$) and the literal control condition ($p = .001$). The conventional metaphor and the literal control conditions did not differ on perceived novelty ($p = 1.00$; see Table 3 for descriptive statistics).

In contrast to Experiment 2, we found an effect of condition on perceived plausibility, $F(2, 605) = 4.84$, $p = .008$, $\eta^2_p = .016$. Respondents who read the literal condition considered it less plausible than participants who read the text with conventional ($p = .009$) or novel metaphors ($p = .072$). There was no difference between the conventional condition and the novel condition ($p = 1.00$).

Table 3. Means (and Standard Deviations) of Dependent Variables Across Experimental Conditions in Experiment 3.

	Experimental Condition		
	Conventional Metaphor (n = 203)	Novel Metaphor (n = 202)	Literal Condition (n = 203)
Participation time	461.58 (223.36)[9]	490.57 (246.91)	512.83 (334.01)
Perceived aptness	5.26 (1.13)	5.14 (1.00)	5.32 (0.96)
Knowledge	0.75 (0.27)	0.75 (0.26)	0.72 (0.27)
Perceived plausibility	5.15 (1.21)[a]	5.06 (1.29)[a,b]	4.78 (1.29)[b]
Perceived novelty	3.96 (1.32)[a]	4.42 (1.05)[b]	3.96 (1.34)[a]
Affective text perception	4.55 (0.87)[a,b]	4.42 (1.00)[a]	4.65 (1.02)[b]
Cognitive text perception	5.53 (0.76)	5.36 (0.93)	5.48 (0.76)
Policy agreement	5.38 (1.18)[a]	4.89 (1.39)[b]	5.36 (1.20)[a]
Policy evaluation	4.51 (1.04)	4.28 (1.07)	4.49 (1.04)

Note. [a,b] Means of variables with different superscripts are significantly different according to pairwise comparisons with a certainty of at least $p < .05$. Standard deviations are given in parentheses. All variables except for participation time and knowledge were measured on a 7-point scale, with 7 indicating higher perceived aptness, plausibility, novelty, cognitive text perception, and affective text perception, more policy agreement, and a more positive policy evaluation. Participation time was measured in minutes. Knowledge was measured from 0 to 1, with 1 being the maximum score.

[9] Qualtrics recorded seconds instead of minutes as in SurveyMonkey.

Hypothesis Testing

We tested our hypotheses in a similar manner to Experiments 1 and 2. We found only a marginally significant multivariate effect of metaphor type on affective and cognitive text perceptions, Pillai's trace = .014, $F(4, 1210) = 2.21$, $p = .066$, $\eta^2_p = .007$. Subsequent univariate analyses revealed no effect of metaphors on cognitive text perceptions ($F(2, 605) = 2.24$, $p = .107$, $\eta^2_p = .007$), and marginally significant effect on affective text perceptions ($F(2, 605) = 2.97$, $p = .052$, $\eta^2_p = .010$). Pairwise comparisons with Bonferroni corrections showed that affective text perception was slightly lower for the text with novel metaphors compared with affective text perception for the literal control text ($p = .045$). Conventional metaphors did not differ from novel metaphors ($p = .557$) or literal controls ($p = .800$).

In contrast to Experiment 2, we found a significant multivariate main effect of metaphor on policy support Pillai's trace = .032, $F(4, 1210) = 4.90$, $p < .001$. Subsequent univariate analysis of variance (ANOVA) demonstrated that metaphors had a significant effect on policy agreement ($F(2, 605) = 9.85$, $p < .001$, $\eta^2_p = .032$) but not on policy evaluation ($F(2, 605) = 2.84$, $p = .059$, $\eta^2_p = .009$). Posthoc tests with Bonferroni corrections demonstrated that policy agreement was lower for participants who saw the condition with novel metaphors compared with policy agreement for the texts with conventional metaphors ($p < .001$) and literal statements ($p = .001$). We found no differences between the conventional metaphor condition and the literal condition ($p = 1.000$).

Next, we tested *H3*. Our analysis reveals a negative indirect effect of novel metaphors ($b = -0.11$, $SE = 0.05$, 95% CI [−0.20, −0.02]), but not of conventional metaphors ($b = -0.05$, $SE = 0.04$, 95% CI [−0.14, 0.04]) on policy agreement through affective text perceptions (see Figure 5). This means that novel metaphors reduced affective text perception, which, in turn, decreased policy agreement. Because we found no effect of metaphor on cognitive text perceptions, we could not further test *H4*, which predicted an indirect effect of conventional metaphor on policy support through cognitive text perception.

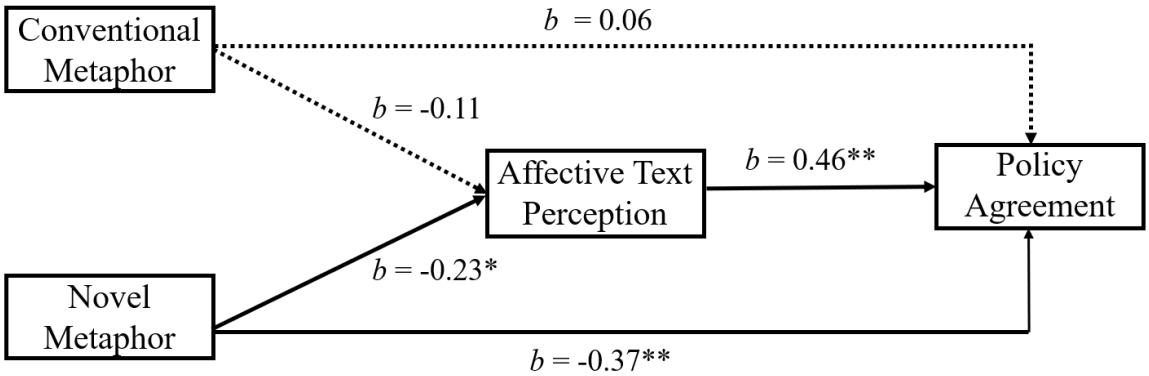

Figure 5. Indirect effects of novel metaphor on policy agreement, through affective text quality.
Note. The literal control condition served as a baseline. Solid lines indicate a significant relation; dotted lines indicate a nonsignificant relation. *Significant at $p < .05$, **significant at $p < .01$.

Exploratory Analyses

We conducted correlation analyses (see Digital Appendix F), which demonstrated that perceived novelty and affective text perception were correlated with policy evaluation and policy agreement. We then ran two exploratory analyses to see whether the indirect effects of novel metaphors on policy support through perceived novelty and affective text perception that we found in Experiment 2 were replicated. Figures 6 and 7 demonstrate that these indirect effects of novel metaphors on both policy agreement (b = 0.05, SE = 0.01, 95% CI [0.02, 0.08]) and policy evaluation (b = 0.04, SE = 0.01, 95% CI [0.02, 0.07]) were replicated.

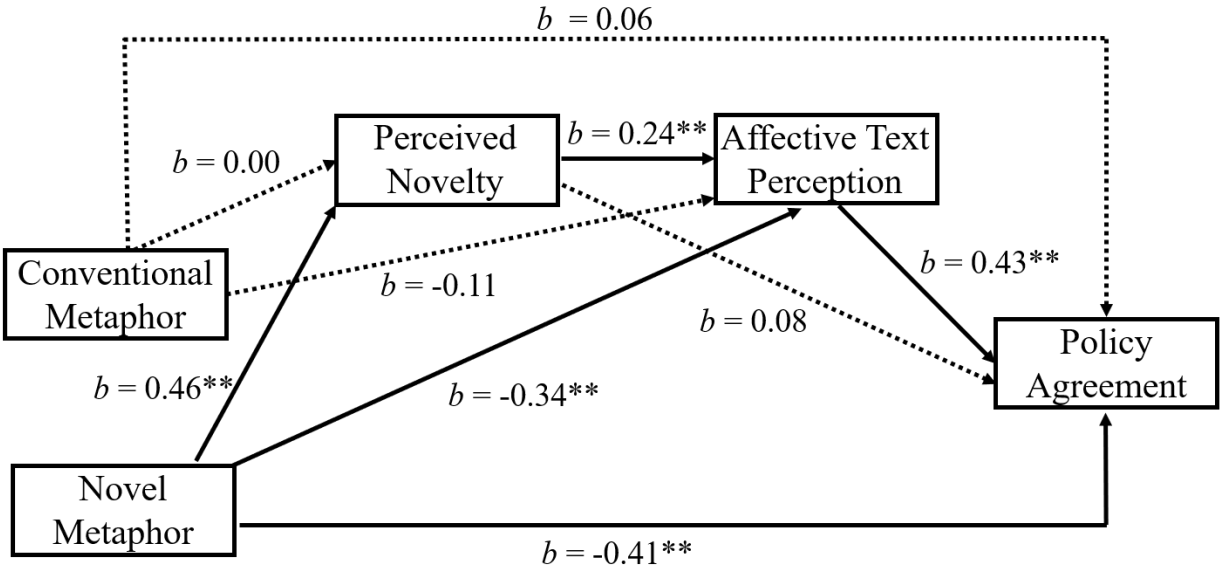

Figure 6. Indirect effects of novel metaphor on policy agreement, through perceived novelty.
Note. The literal control condition served as a baseline. Solid lines indicate a significant relation; dotted lines indicate a nonsignificant relation. *Significant at p < .05, **significant at p < .01.

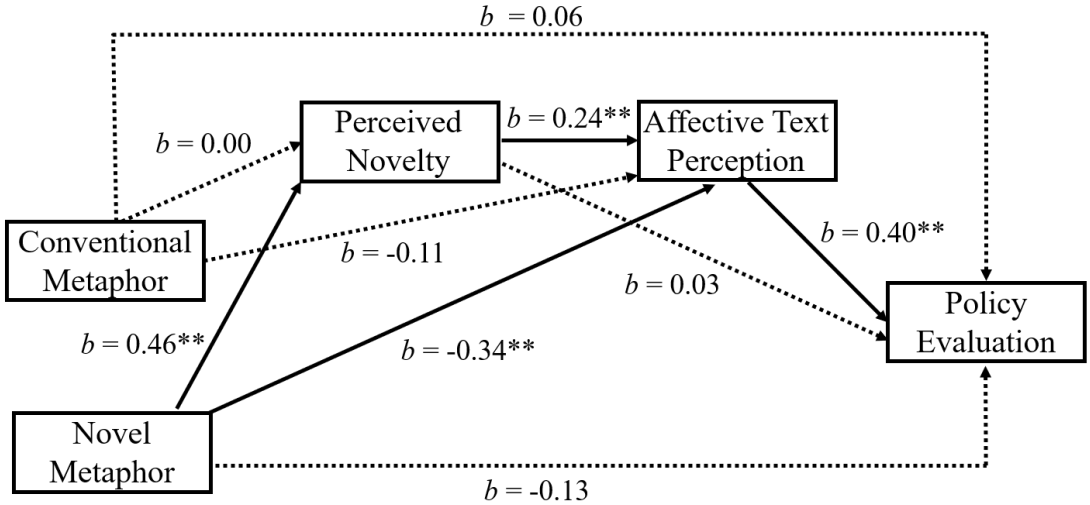

Figure 7. Indirect effects of novel metaphor on policy evaluation, through perceived novelty and then via affective text perception.

Note. The literal control condition served as a baseline. Solid lines indicate a significant relation; dotted lines indicate a nonsignificant relation. *Significant at $p < .05$, **significant at $p < .01$.

Discussion and Conclusion

We conducted three experiments to examine (1) the direct effects of conventional metaphors on cognitive text perceptions and of novel metaphors on affective text perceptions; and (2) whether and how cognitive and affective text perceptions, in turn, impact policy support. The two hypotheses that novel metaphors would increase affective text perceptions (*H1*) and that conventional metaphors would increase cognitive text perceptions (*H2*) were not supported in the three experiments. Experiment 1 had a longer text with a lower percentage of metaphorical words than Experiments 2 and 3. In Experiment 1, an unexpected effect of novel metaphors was found on cognitive text perception, in that novel metaphors (vs. literal controls) increased cognitive text perception. Cognitive processing has been associated with the interpretation of texts, and past literature has hypothesized that the conventional metaphors decrease the complexity of the messages and help to make an abstract concept more concrete (Burgers et al., 2015; Hartman, 2012). One possible reason for this unanticipated effect is that, even though the novel metaphors were recognized as novel in the pretest, the novel and conventional target expressions did not differ on perceived novelty in the main experiment for three of five cases. This suggests that the novel metaphors may have been near-synonyms of a conventional mapping, and thus, followed the mapping principles (MPs) for the conceptual metaphor (Ahrens, 2010).

This type of novel metaphor (i.e., one following the MPs) may be considered a type of incremental change (Burgers & Ahrens, 2020), and thus does not add excessively to the reader's cognitive processing load. In addition, Experiment 3 showed a marginally significant effect of novel metaphors on affective text perceptions, in that novel metaphors were less appreciated than literal controls (see also Van Stee et al., 2018).

The third and fourth hypotheses predicted indirect effects of novel metaphors on policy support via affective perceptions (*H3*) and indirect effects of conventional metaphors on policy support via cognitive perceptions (*H4*). We could not directly test these hypotheses in Experiments 1 and 2 as we did not find the expected effects of novel metaphors on affective text perceptions (*H1*) and of conventional metaphors on cognitive text perceptions (*H2)*. Experiment 3 also did not support *H3*: Even though we found an indirect effect of novel metaphors on policy agreement through affective text perceptions, the effect was in the opposite direction of our expectations. In addition, we did not find direct effects of metaphors on policy support in Experiments 1 and 2. This is in line with previous research that revealed that the relationship between metaphors and policy support is not straightforward (Boeynaems et al., 2017; Burgers et al., 2015). Experiment 3 again demonstrated a negative effect of novel metaphors on policy agreement.

Subsequently, we ran exploratory analyses to assess relationships between text perceptions and policy support. First, all the three studies showed that cognitive and affective text perceptions correlated with policy support. More importantly, we tested for alternative indirect effects paths. In Experiment 1, we found that novel metaphors increased cognitive text perceptions, which, in turn, boosted policy support. Experiments 2 and 3 revealed a sequential indirect effect, in that novel metaphors increased perceived novelty, which increased affective text perceptions, which, in turn, increased policy support. Thus, we find that both cognitive responses (Experiment 1) and affective responses (Experiments 2 and 3) can impact the persuasiveness of metaphors.

The indirect effects also support predictions of the DSMM (Valkenburg & Peter, 2013), which predicts that various response states (e.g., cognitive, emotional) impact media effects. In addition, our results are also in line with results from a recent meta-analysis on the effectiveness of creativity in the field of marketing communication (Rosengren, Eisend, Koslow, & Dahlen, 2020). This meta-analysis demonstrates that cognitive processing of advertisements is an important predictor of persuasiveness, in line with the indirect effect found in Experiment 1. In addition, Rosengren and associates (2020) also demonstrate that originality (e.g., novelty) can be persuasive through affect transfer. This means that affective responses evoked by the text translate to the perception of the issue under discussion. Thus, positive affective responses to an original (or novel) text could make issue perceptions more in line with the position taken in the text, in line with the indirect effects in Experiments 2 and 3. We recommend that future research tries to replicate these findings for other metaphors in other settings and cultures. The affect-transfer hypothesis entails that when novel metaphors increase positive affective text responses, the persuasiveness of the text increases. By contrast, following this hypothesis, when novel metaphors lead to more negative affective responses, text persuasiveness will decrease. To test the affect-transfer hypothesis for novel metaphors, a main effect of novel metaphors on affective responses needs to be found. In case (novel) metaphors do not impact affective responses (as in Experiment 1), it is not possible to test the affect-transfer hypothesis for (novel) metaphors.

The current study investigated whether and *how* metaphor novelty impacts foreign policy support. We found that novel metaphors reduced policy support (Experiment 3). We also found various indirect effects, suggesting that novel metaphors can affect policy support through cognitive (Experiment 1) and affective text perceptions (Experiments 2 and 3). These results demonstrate that novel metaphors can assist

readers in sensemaking of texts about new topics: They can draw attention to the language with their novelty, but can also backfire when not appreciated.

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