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## RESEARCH REPORT

# Reading Dilemmas in a Foreign Language Reduces Both Deontological and Utilitarian Response Tendencies

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Moral dilemmas entail deciding whether to cause harm to maximize overall outcomes, such as killing 1 person to save 5. Past work has demonstrated that people are more willing to accept causing such outcome-maximizing harm when they read dilemmas in a foreign language they speak rather than their native language. Presumably this effect is due to foreign dilemmas inducing reduced emotional impact, rather than increased cognitive processing, but previous work cannot distinguish between these possibilities because it treats them as diametric opposites. In the current work, we applied process dissociation to independently estimate harm-rejection and outcome-maximization response tendencies underlying dilemma responses. These findings reveal that reading dilemmas in a foreign language reduces both harm-rejection and outcome-maximization inclinations. This pattern clarifies past work by suggesting that reading dilemmas in a foreign language reduces concern for all potential victims—both the fewer to be harmed and the majority to be saved.

*Keywords:* moral judgments, foreign language effect, process dissociation

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Would you torture someone to stop a bomb from killing innocent people? Your response might depend on whether you learn of this scenario in your native tongue or a foreign language. The torture dilemma is an example of a class of moral conundrums where directly causing harm maximizes overall outcomes. Such dilemmas were developed to contrast two philosophical positions (Foot, 1967): Rejecting harm (despite failing to maximize outcomes) is consistent with deontological philosophy, in which the morality of actions hinges on their intrinsic nature. Conversely, accepting harm to maximize outcomes is consistent with utilitarian philosophy, in which the morality of actions hinges upon their outcomes (Greene, 2014). Philosophy aside, researchers have focused on the psychological mechanisms driving dilemma responses. According to the dual-process model, dilemma judgments arise from the interplay between (a) affective reactions to harm that motivate harm rejection and (b) cognitive evaluations of outcomes that motivate harm acceptance to maximize outcomes (Greene, Sommerville, Nystrom, Darley, & Cohen, 2001).

One common finding involves the foreign language effect: People are typically more willing to accept harm to maximize outcomes—consistent with utilitarianism—when encountering dilemmas written or spoken in a foreign tongue (Costa et al., 2014a; Cippolletti, McFarlane, & Weissglass, 2016; Geipel, Hadjichristidis, & Surian, 2015a, 2015b, 2016; Keysar, Hayakawa, & An, 2012). From a dual-process perspective, this pattern could reflect either reduced affective reactions to harm (i.e., reduced deontological inclinations) or increased cognitive evaluations of outcomes (i.e., increased utilitarian inclinations) for dilemmas presented in a foreign language. Past findings reveal only changes in the overt pattern of responding, without clarifying which process explains this pattern. In other words, we know that people respond differently in a foreign language, but we still do not know why this happens. Past research remains ambiguous because researchers assessed only conventional relative dilemma judgments that treat deontological and utilitarian judgments as diametric opposites. Conversely, we used process dissociation (PD) to independently assess deontological and utilitarian response inclinations to clarify the foreign language effect so that we can observe changes in deontological and utilitarian inclinations separately.

Process dissociation was developed by Jacoby (1991) before it was applied to dilemma decision making (Conway & Gawronski, 2013). Process dissociation entails assessing conventional incongruent dilemmas in which causing harm maximizes outcomes. For example, consider the torture dilemma from earlier—torturing one person will save many lives. Such dilemmas are incongruent because causing harm violates deontology but upholds utilitarianism. However, process dissociation also entails assessing congruent dilemmas in which causing harm does not maximize outcomes. For example, in the

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congruent torture dilemma, torture still stops a bomb—but instead of a deadly explosive, it’s a messy but harmless paint bomb. Such dilemmas are congruent because rejecting harm upholds both deontology and utilitarianism—although people may still accept harm for nonmoral reasons, such as sadism, vengeance, or self-interest. Moreover, people may approve the intentions behind an action (desire to save someone) despite the outcomes being negative—hence, one could respond that such action was morally appropriate.

Note that all congruent dilemmas were designed such that causing harm failed to maximize outcomes—thus, choosing to act (cause harm) decreases net utility, even though it may result in personal advantage or fulfil other nonmoral motives.

By plugging responses to both dilemma types into a processing tree (see Figure 1), researchers can algebraically derive two parameters that independently track utilitarian response inclinations (consistently maximizing outcomes) and deontological inclinations (consistently rejecting causing harm) using the following formulas. *U* describes the case in which utilitarianism drive judgments, and *D* describes the case in which deontology drives judgments. Therefore,  $1 - U$  describes the case in which utilitarianism does not drive judgments, and  $1 - D$  describes the case in which deontology does not drive judgments. Hence, the probability of judging harm as unacceptable on congruent dilemmas is represented by the case in which either utilitarianism drives the response, or deontology drives the response if utilitarianism does not. This can be solved for algebraically:

$$p(\text{unacceptable}|\text{congruent}) = U + [(1 - U) \times D] \quad (1)$$

Conversely, the probability of judging harm as acceptable on congruent dilemmas can be solved for algebraically as well by considering the cases in which neither utilitarianism nor deontology drives judgments:

$$p(\text{acceptable}|\text{congruent}) = (1 - U) \times (1 - D) \quad (2)$$

Furthermore, we can solve for the probability of rejecting harm on incongruent dilemmas, which reflects deontological but not utilitarian tendencies:

$$p(\text{unacceptable}|\text{incongruent}) = (1 - U) \times D \quad (3)$$

Finally, the probability of accepting harm on incongruent dilemmas reflects either utilitarian tendencies or the absence of both utilitarian and deontological tendencies:

$$p(\text{acceptable}|\text{incongruent}) = U + [(1 - U) \times (1 - D)] \quad (4)$$

Therefore, by calculating the probability of accepting and rejecting harm on congruent and incongruent dilemmas, we can combine formula to solve to estimate utilitarian and deontological response tendencies using formulas 5 and 6. In formula 5, subtracting the probability of rejecting harm on incongruent dilemmas from the probability of rejecting harm on congruent dilemmas indicates the tendency to always maximize outcomes, regardless of whether doing so entails causing harm—that is, utilitarian response inclinations (*U*).

$$U = p(\text{unacceptable}|\text{congruent}) - p(\text{unacceptable}|\text{incongruent}) \quad (5)$$

Having obtained *U*, we can divide the probability of rejecting harm on incongruent dilemmas by the inverse of *U* to estimate the tendency to always reject causing harm, regardless of whether doing so maximizes outcomes or not—that is, the deontology parameter.

$$D = p(\text{unacceptable}|\text{incongruent}) / (1 - U) \quad (6)$$

Following these formulae provides independent estimates of utilitarian and deontological response tendencies for each participant.

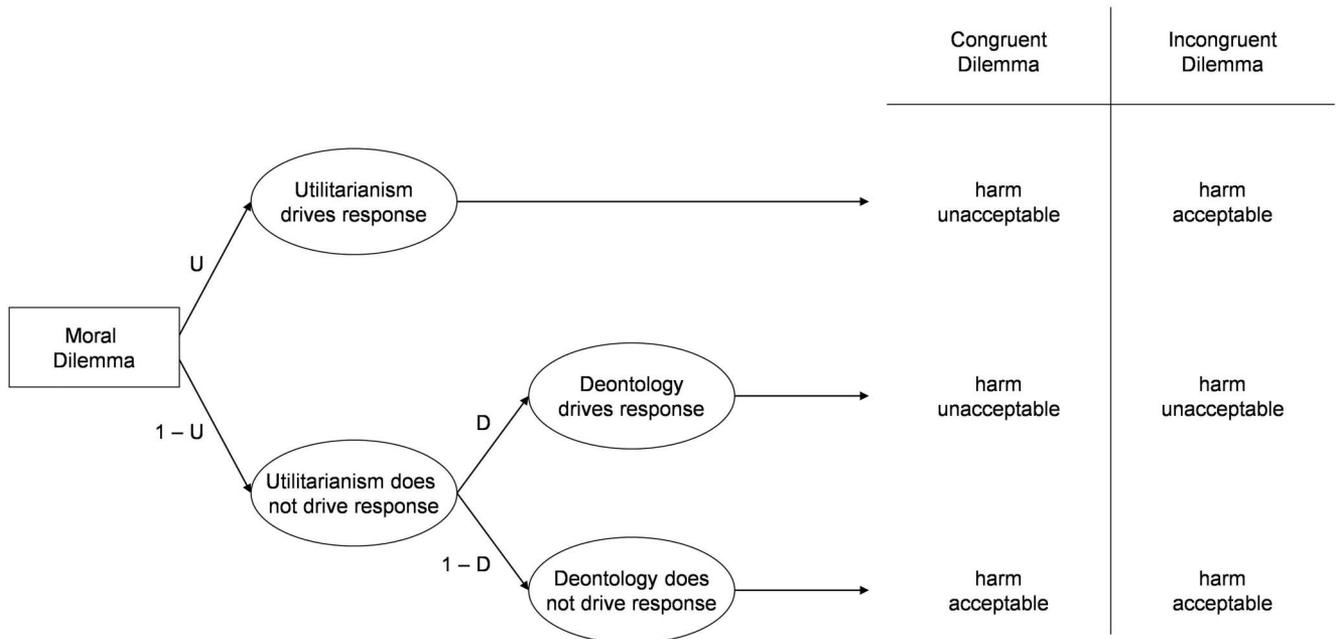


Figure 1. Processing tree illustrating the components leading harm acceptance and harm rejection judgments for both congruent and incongruent moral dilemmas. *U* = utilitarianism drive judgments; *D* = deontology drives judgments;  $1 - U$  = utilitarianism does not drive judgments;  $1 - D$  = deontology does not drive judgments.

Note that the PD dilemma battery also provides a measure of conventional dilemma judgments in which higher scores suggest more utilitarian responses and lower scores reflect more deontological responses (i.e., the number of times people accept causing outcome-maximizing harm on incongruent dilemmas only).

The deontology and utilitarian parameters are typically uncorrelated, despite both correlating highly with relative dilemma judgments (see meta-analysis by Friesdorf, Conway, & Gawronski, 2015). Conway and Gawronski's (2013) findings suggest that the deontology parameter tracks affective reactions to harm, whereas the utilitarian parameter tracks cognitive evaluations of outcomes (see also Lee & Gino, 2015; Park, Kappes, Rho, & Van Bavel, 2015). Process dissociation can also detect findings invisible to conventional analysis—for example, moral identity correlated positively with both parameters, which canceled out for relative judgments (Conway & Gawronski, 2013).

In the current study, participants completed the Conway and Gawronski PD dilemma battery in either a foreign language or their native tongue. This design can clarify whether the foreign language effect primarily reflects reduced affective reactions to harm (i.e., reduced deontology parameter) or increased cognitive evaluations of outcomes (i.e., increased utilitarian parameter).

## Experiment

### Participants

According to G\*power (Faul, Erdfelder, Lang, & Buchner, 2007), we needed 100 participants to obtain 95% power for a  $2 \times 2$  ANOVA repeated-measures design with one factor between subjects and one within subjects, assuming an effect size of  $\eta_p^2 = 0.15$  (based on the average effect size obtained by Costa et al., 2014a and Geipel et al., 2015a), when  $\alpha = .05$  and correction among repeated measures = 0.1. Because we recruited students during their classes, we could not collect the exact required number of participants. Also, having in mind that we will have to exclude participants with insufficient foreign language comprehension skills, altogether we recruited 167 students—all native Polish speakers—from the Maria Curie-Skłodowska University in Lublin, Poland. For our findings to be interpretable, we needed to assure that individuals in the foreign language group understood the dilemmas, which they subsequently judged. To assure this, following Costa, Foucart, Arnon, Aparici, and Apesteguia (2014b), we asked participants how well they understood the dilemmas and excluded those whose self-reported comprehension was lower than 50% (i.e., they scored 5 or less on a scale of 1–10). The final sample consisted of 140 participants ( $M_{\text{age}} = 20.9$ ,  $SD = 1.51$ ; 91 women), with 83 who read dilemmas in their native language (Polish) and 57 who read dilemmas in a foreign language (English).

The procedure was reviewed and approved by the Kozminski University Ethics Committee.

### Materials and Procedure

We conducted the experiment in groups during class, with participants randomly assigned to read the Conway and Gawronski (2013) moral dilemma battery presented in either Polish (their native language) or English (a foreign language they spoke). The battery consists of 20 moral dilemmas: 10 incongruent dilemmas (in which

deontology and utilitarianism cue different responses) and 10 congruent dilemmas (in which deontology and utilitarianism cue the same, negative response). We translated materials from English to Polish, then backtranslated them, before they were reviewed by an independent bilingual judge to ensure close conceptual match across languages. We compared our version with an alternative translation, kindly provided to us by another team of researchers led by Ewa Szumowska, and reconciled the differences. We informed participants that there were no correct answers and arranged the dilemmas in the same fixed random order as the original study. Finally, participants completed some comprehension questions (e.g., they estimated how well they understood the dilemmas presented on a scale of 1–10), reported the amount of points obtained on the secondary school-leaving examination in English and were debriefed.

## Results

We began by analyzing conventional relative dilemma scores before conducting a process dissociation analysis. In light of recent methodological advances in psychological science (Cumming, 2013), we tested effects using both the traditional null hypothesis significance testing procedure as well as Bayes factors. Note that in the Bayesian analysis,  $B < .33$  suggests substantial evidence against between-groups differences, whereas  $B > 3.00$  suggests substantial evidence supporting between-groups differences. Values between .33 and 3.00 are seen as inconclusive (Dienes, 2014).

### Conventional Analysis

We conducted a between-subjects ANOVA to compare conventional relative dilemma responses across language conditions, controlling for the gender of participants because women typically score higher than men on the deontology parameter but equally on the utilitarian parameter (Friesdorf et al., 2015). Recall that this analysis assesses whether participants accepted causing outcome-maximizing harm (consistent with utilitarianism and inconsistent with deontology) across the 10 incongruent dilemmas. Thus, higher scores reflect more utilitarian/less deontological responding. Unlike past research, this analysis revealed no significant difference between the foreign ( $M = 60.9$ ,  $SD = 20.7$ ) versus native language ( $M = 62.2$ ,  $SD = 15.5$ ) condition,  $F(1, 137) = 1.386$ ,  $p = .241$ ,  $\eta_p^2 = .010$ ,  $B = 0.35$  (see Figure 2).<sup>1</sup> However, on congruent dilemmas in which people consider harms that do not maximize outcomes, participants were more willing to accept such harm in their foreign ( $M = 38.6$ ,  $SD = 21.4$ ) versus native

<sup>1</sup> This null finding is somewhat surprising in the face of several replications of the foreign language effect (e.g., Corey et al., 2017). One possible explanation for the difference might be the procedure itself: In the current work, participants completed 20 dilemmas (10 incongruent and 10 congruent), whereas other studies typically presented either a single or a few dilemmas. It may be that considering multiple dilemmas sequentially led more participants to choose the utilitarian option than otherwise, thereby making it difficult to detect the classic foreign language effect. In line with this explanation, other work using large dilemma batteries (39 dilemmas) also failed to obtain the classic foreign language effect (Chan, Gu, Ng, & Tse, 2016). Alternatively, one can suggest that the foreign language affects only high-conflict dilemmas (such as having to kill a man with own hands to save five) but not when such sacrifice can be made indirectly, for example, by hitting a switch. PD battery consists of both types of the dilemmas; hence, the effect of language can be suppressed.

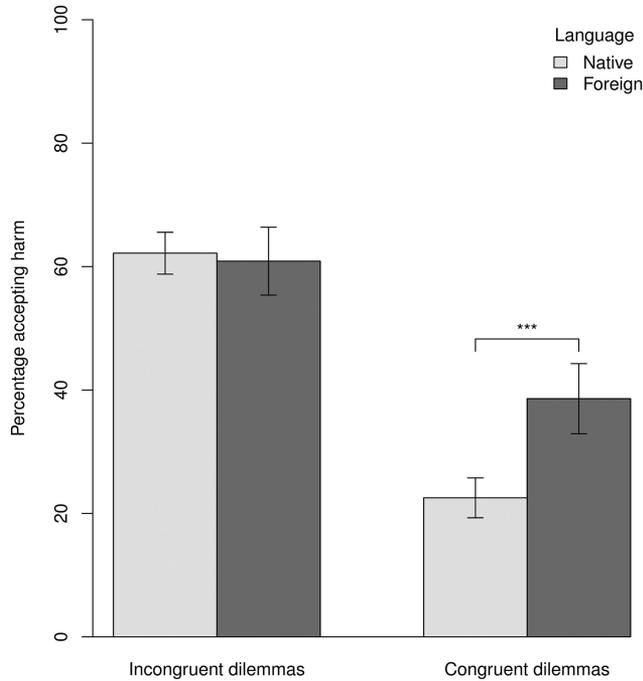


Figure 2. Percentage of participants accepting harm that maximizes outcomes (incongruent dilemmas) and harm that does not maximize outcomes (congruent dilemmas) in native or foreign language dilemmas. \*\*\* $p < .001$ . Error bars reflect 95% confidence intervals.

language ( $M = 22.5$ ,  $SD = 14.8$ ),  $F(1, 137) = 21.889$ ,  $p < .001$ ,  $\eta_p^2 = .138$ ,  $B = 2,660.61$ .

### Process Dissociation Analysis

We followed the procedures outlined by Conway and Gawronski (2013) to compute and standardize the utilitarian and deontological process dissociation parameters. We entered these parameters into a 2 (parameter: utilitarian vs. deontological)  $\times$  2 (language: native vs. foreign) repeated-measures, mixed-model ANOVA in which the parameter was treated within subjects and the language between subjects. As in a conventional analysis, gender was inserted in the process dissociation analysis. With Bayesian modeling, the first step is to select the most plausible model among possible models, which was the model including only the main effect of language,  $F(1, 137) = 25.113$ ,  $p < .001$ ,  $\eta_p^2 = .155$ ,  $B = 4907.43$ , but no interaction (overall model  $B = 22.94$ ). Post hoc analyses (see Figure 3) indicated that the utilitarian parameter was significantly lower in the foreign ( $M = -0.419$ ,  $SD = 1.054$ ) than native language condition ( $M = 0.361$ ,  $SD = 0.832$ ),  $F(1, 137) = 22.276$ ,  $p < .001$ ,  $\eta_p^2 = .140$ ,  $B = 2829.48$ . Likewise, the deontological parameter was also significantly lower in the foreign ( $M = -0.355$ ,  $SD = 1.041$ ) than native language condition ( $M = 0.239$ ,  $SD = 0.942$ ),  $F(1, 137) = 7828$ ,  $p = .006$ ,  $\eta_p^2 = .054$ ,  $B = 6.15$ .

Similar to previous findings, standardized PD parameters correlated only weakly with each other,  $r(138) = .230$ ,  $p = .006$ ,  $B = 4.22$ .

Finally, we replicated the gender by parameter interaction reported by Friesdorf et al. (2015),  $F(1, 138) = 18.561$ ,  $p < .001$ ,

$\eta_p^2 = .119$ ; interaction model  $B = 20.89$ . Women ( $M = 0.325$ ,  $SD = 0.959$ ) scored higher than men ( $M = -0.611$ ,  $SD = 0.849$ ) on the deontology parameter,  $F(1, 138) = 32.781$ ,  $p < .001$ ;  $\eta_p^2 = .192$ ;  $B > 100,000$ , whereas women ( $M = 0.115$ ,  $SD = 0.983$ ) and men ( $M = -0.091$ ,  $SD = 1.034$ ) did not significantly differ on the utilitarian parameter,  $F(1, 138) = 1.350$ ,  $p = .247$ ,  $\eta_p^2 = .010$ ;  $B = 0.36$ .

Given that past research using conventional relative dilemmas found increased endorsement of outcome-maximizing harm (consistent with utilitarianism) in a foreign versus native language and we found a null effect, we examined how robust our findings are. Specifically we wanted to check whether our findings were not driven solely by the exclusion criterion that we have used and to confirm that the dilemmas were indeed well understood by the participants. Reassuringly, the utilitarian and deontological parameters remain significantly smaller in the foreign language condition if we either relax our exclusion criterion (i.e., if we include participants, regardless of their level of comprehension of the dilemmas) or make it stricter (i.e., if we include only participants with a score of 9 or 10). Our core findings are also similar if we prescreen participants based not on their comprehension of the dilemmas but on their self-reported proficiency in the foreign language (more specifically, if we exclude participants with a general proficiency or reading skills score of 5 or less (on a scale of 1–10)). Moreover, the key pattern appears for both participants with a high objective proficiency in English (who scored at least 50% on the higher-tier school-leaving examination in English), and the remainder of participants in the foreign language condi-

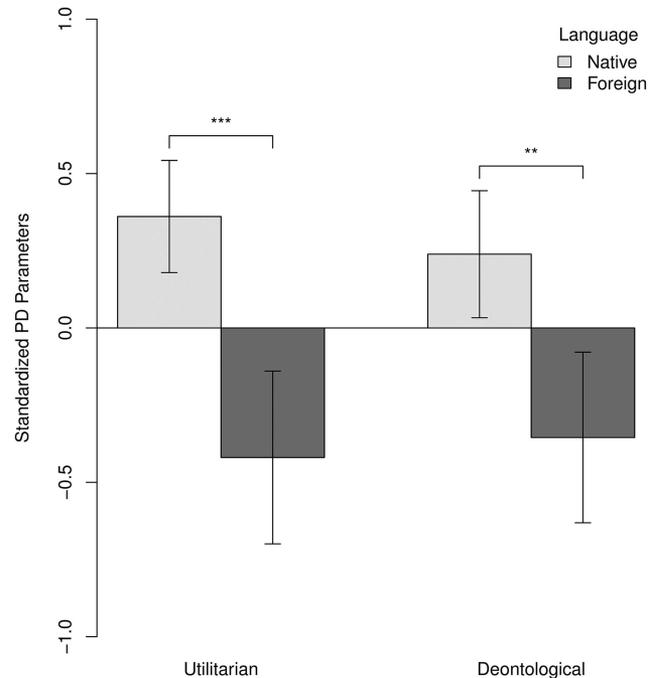


Figure 3. Participants scored higher on both the utilitarian (reflecting outcome-maximization tendencies) and deontology PD parameters (reflecting harm-rejection tendencies) when reading dilemmas written in their native versus a foreign language. \*\* $p < .01$ . \*\*\* $p < .001$ . Error bars reflect 95% confidence intervals.

tion. We also tested the possibility that the different sensitivity of acceptance rates in incongruent and congruent dilemmas were due to a coincidental increased processing difficulty of the latter (that the dilemmas happened to be written in a more complex language and thus were less comprehensible for foreign language users). However, the readability (e.g., the Flesch-Kincaid Reading Ease score) of congruent and incongruent dilemmas was not significantly different. The results of all of the robustness checks are available in the Supplemental Online Materials (in which we also compared the dilemmas' harm acceptance rates).

## Discussion

The current work used process dissociation to clarify ambiguous previous findings regarding the foreign language effect in dilemma research. Unlike past work (e.g., Costa et al., 2014a), we did not find that participants were more willing to accept causing outcome-maximizing harm (consistent with utilitarianism) when reading dilemmas in a foreign language. Instead, participants reading foreign language dilemmas were more willing to accept harm on congruent dilemmas in which harm fails to maximize outcomes. Moreover, process dissociation revealed that both the deontological and utilitarian parameters were significantly lower when participants read foreign rather than native language dilemmas. These findings suggest that participants reading foreign language dilemmas evinced both (a) reduced inclinations to avoid harming one person and (b) reduced inclinations to maximize overall outcomes. In other words, people reading foreign language dilemmas appeared less concerned with harm to either the person to be sacrificed or the people to be saved.

Previous work on this topic suggested that reading foreign language dilemmas either reduced affective reactions to harm or increased cognitive evaluations of outcomes. Indeed, most previous theorists have argued that the foreign language effect reflects mitigated emotional reactions (Keysar et al., 2012; Costa et al., 2014a), consistent with earlier studies showing reduced emotional reactivity in less language-proficient participants (Caldwell-Harris, 2015). Our findings are clearly in line with the first possibility but directly contradict the second. Moreover, they suggest that reduced emotional reactivity may reduce concern not only for the person to be sacrificed but also the group to be saved—a pattern impossible to detect using conventional methods.

Other theorists have argued that foreign languages exempt people from self- or socially imposed norms (Gawinkowska, Paradowski, & Bilewicz, 2013; Geipel et al., 2015a, 2015b). Insofar as both deontology and utilitarianism imply moral norms, our results are consistent with this possibility. If so, then people reading dilemmas in a foreign language may view them as largely non-moral in content. Accordingly, participants reported reduced confidence levels when making dilemma decisions in a foreign versus native language (Geipel et al., 2015a). Note that these explanations are compatible: Failure to encode the dilemmas as moral in content may result in reduced emotional reactions to harm and vice versa. Future work should clarify whether they work in tandem.

One of the limitations of our study is that we used only one pair of noncounterbalanced languages: Polish was always the native language and English the foreign one. Thus, we must exercise caution when generalizing from these findings. It remains possible that the effects described here reflect the peculiarities of Polish or

English rather than the general phenomenon of reading dilemmas in a foreign language. However, the results of the previous studies in which different pairs of languages were used suggest that the foreign language effect is robust across numerous languages (e.g., Keysar et al., 2012; Costa et al., 2014a, 2014b). Future work should determine whether we are correct to hypothesize that PD analyses would obtain similar reductions in both parameters across other languages.

In summary, our findings suggest that reading dilemmas in a foreign language reduces concern for the well-being of all potential victims by reducing both deontological and utilitarian inclinations. Therefore, when considering real-life moral dilemmas, such as whether the German military should shoot down hijacked aircraft to prevent a larger disaster (Whitlock, 2006), perhaps decision makers should stick to their native tongue.

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