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**Choosing is losing: Emotional attenuation in foreign language decision-making**

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## Abstract

**Introduction:** Recent research suggests that people who make decisions in a foreign language (FL) tend to be less emotionally affected and hence more utilitarian than in their native language (NL) (e.g. Costa, Vives, & Corey, 2017). One of the possible explanations for this effect involves the concept of emotional attenuation. Hence, the current study employed five personal dilemmas with varying levels of emotionality, under the hypothesis that the FL effect would disappear in highly emotional dilemmas, as these might evoke a maximal and therefore similar emotional response in the FL and NL. Furthermore, we included both second (L2) and third (L3) language conditions. **Method:** 557 native speakers of Dutch with English and French as their L2 or L3 were considered for the analysis. From each participant, proficiency measures in different languages were gathered. All participants were randomly assigned to one of five dilemmas either in Dutch, French or English, for which they were offered a choice between a utilitarian and a deontological response. **Results:** Our results showed the FL effect was present and strongest in the least emotional dilemmas and absent in the most emotional ones. The effect was however not more or less prominent in the less proficient third language. **Discussion:** The current results support the hypothesis that FL processing leads to emotional attenuation (up to a certain level) and brings about less deontological reasoning. However, we also propose a role of response agreement.

*Keywords:* decision-making, moral judgment, bilingualism, foreign language effect, response agreement

## Introduction

If you were asked to sacrifice one person in order to rescue five, would you? This is one of the most frequently recurring questions in moral judgment. There are two possible reactions to such a dilemma, and neither of them is either wrong or right. Notwithstanding, if you sacrifice one person to save others, you are making a utilitarian decision, reasoning in a more rational way and, as such, maximising well-being for the majority of a population. If you do not, your response is deontological in nature, and you are operating under the principle that causing harm is morally wrong, regardless of the consequences. One would expect that no matter where you are or what you are doing; this type of choice will depend on intrinsic traits and moral values, and nothing else. However, previous studies have shown that individuals are more inclined to be utilitarian (i.e. opting for the greater good, and hereby renouncing the rights of the individual) when a dilemma is formulated in their foreign language (FL) as opposed to their native one (NL); a phenomenon which is referred to as the ‘moral foreign language effect’ (e.g. Cipoletti, McFarlane, Weissglass, 2016; Costa et al., 2014).

One possible explanation for this effect was uttered by Keysar, Hayakawa, and An (2012) and Costa, Foucart, Arnon, Aparici, and Apesteguia (2014). They reasoned that making cognitive (non-moral) decisions in an FL could result in a decrease in heuristic bias (usually defined as flaws in judgment as a consequence of fast and non-deliberative thinking) for problems concerning risk taking and loss aversion, due to the emotional attenuation that is experienced during FL processing. In other words, because FL words yield less emotional activation, participants who deal with these problems in their FL will tend to look at the situation at hand in a more rational manner. This rationale builds upon

previous research that has indeed demonstrated emotions are processed less intensively in an FL (Caldwell-Harris & Ayçiçeği-Dinn, 2009; Dewaele, 2008; Harris, 2004; Harris, Ayçiçeği, & Gleason, 2003). For instance, the emotional intensity of taboo words, swear words, and childhood reprimands is higher in the native or first (L1) as opposed to the second (L2) language (Dewaele, 2004; Harris, 2004). This difference in emotional resonance can be seen as a function of FL age of acquisition (AoA) and FL proficiency; earlier acquisition (Dewaele, 2004; Harris, 2004; Harris, Gleason, & Ayçiçeği, 2006) and higher proficiency (Harris et al., 2006; Sianipar, Middelburg, & Dijkstra, 2015; Sutton, Altarriba, Gianico, & Basnight-Brown, 2007) are associated with more native-like emotional processing. An L1 is generally learnt in a highly emotional context (i.e. in the context of attachment to caregivers), whereas an L2 is often acquired in a formal (less emotional) setting. Hence, early age of acquisition functions as a proxy for a more emotional learning context. As for proficiency, higher levels may be a marker of more exposure to emotional contexts of learning (Harris et al., 2006). As such, in decision-making, attenuation of emotions in an FL would reduce intuitive reasoning and consequently lead to a reduction in heuristic biases.

The involvement of emotional attenuation was further corroborated when Costa et al. (2014) examined the FL effect, this time for different moral conundrums. They included both the *Footbridge* and the *Switch* dilemma and found that FL processing led to an increase in utilitarianism only in the *Footbridge*. Here, people are asked whether they are willing to push a big man onto a railway track where a trolley is headed to kill five people, hereby stopping the trolley but killing the big man. Participants were more likely to push the big man in the FL than in the NL condition. Although the *Switch* dilemma presents a

similar problem (people are asked to flip a switch to redirect the trolley onto another track where it will kill one person instead of five), an FL effect did not appear. This could well be due to different levels of emotionality. As Greene, Sommerville, Nystrom, Darley, and Cohen (2001) indicated, ethical dilemmas vary systematically in the extent to which they engage emotional processing. Making a distinction between personal (*Footbridge*) and impersonal (*Switch*) quandaries, they argued that emotional engagement is greater in the personal condition. In other words, the distinction and susceptibility to FL manipulations relies on the fact that some dilemmas are more emotionally salient than others.

Taking the findings of Costa and colleagues into account, Geipel, Hadjichristidis, and Surian (2015a) hypothesised that if the FL effect is driven by emotional attenuation, raising the level of emotionality should increase the FL effect. They presented their participants with the *Crying Baby* dilemma, in which one must decide whether to smother one's own child in order to save oneself and several others from being found and killed by enemy soldiers. However, the FL effect appeared to be completely absent for this very personal dilemma, whereas it was visible in a more impersonal dilemma (*Lost Wallet*), where participants were asked whether it was appropriate to keep money found in a lost wallet. Consequently, Geipel et al. dismissed the emotional attenuation effect to opt for a more sociological perspective. They explained that social and moral rules prohibit a person from pushing another or keeping a lost wallet, but not from flipping switches (cf. Cushman, 2013). Mental accessibility to these social and moral norms, which are learnt and experienced through interactions involving the NL, would then be reduced by use of an FL (Geipel, Hadjichristidis, & Surian, 2015b), leading to more rational judgment only in dilemmas for which these norms play a crucial part. Still, the fact that Costa et al. (2014)

failed to find an FL effect in their impersonal condition (*Switch*) can also easily be explained by the occurrence of a ceiling effect, as the number of utilitarian responses in the NL was already as high as 81% (in FL this was 80%). This makes it hard to obtain an FL effect, even if emotions are less strong in a non-native language.

An additional explanation for the moral FL effect was more recently provided by Hayakawa, Tannenbaum, Costa, Corey, and Keysar (2017), who compared blunted deontology and heightened utilitarianism as possible explanations for the effect. The former entails a reduction of deontological responses in FL decision-making due to emotional attenuation, whereas the latter implies an increase in utilitarian responses due to increased deliberative thinking. Hayakawa et al. employed a process-dissociation technique, in which they presented each participant with 20 dilemmas that could provide independent measures of deontological and utilitarian responding (see also Conway & Gawronski, 2013), looking at dilemma congruency. Traditional dilemmas, such as *Footbridge*, are incongruent as deontological and utilitarian concerns are in conflict with one another. These dilemmas can be made congruent by adapting part of the story; for instance, asking whether it is appropriate to sacrifice one life to prevent five people from being mildly injured. In this case, neither deontological nor utilitarian concerns could endorse sacrificing the one. Presenting the participants with a combination of these two types of dilemmas, the authors were able to calculate a utilitarianism and a deontology parameter (see Hayakawa et al., 2017). They consistently found lower deontology scores for participants in the FL condition compared to those in the NL condition (see also Muda, Niszczoła, Białek, & Conway, 2017) and no increases in utilitarian scores, suggesting that the FL effect relies on blunted deontology rather than heightened utilitarianism, which led the authors to conclude that

stunted emotions are at the basis of the effect. McFarlane and Perez (2020), however, noted that the explanation of stunted emotions or blunted deontology should be treated with caution. They argue that it is common practice within the field to use proxies or partial measures for emotions, that there is a lack of a predictive and generalisable theory of emotion and specific emotion-theory, and that the obscurity of a baseline level of neutrality with respect to participant emotion is problematic. Therefore, they argue that although the reduced emotionality account of the moral FL effect may well be the strongest explanation at this moment, a certain agnosticism is the most warranted epistemic position for the time being.

It is further interesting that the general (monolingual) decision-making literature assumes that cognitive rather than emotional demands are the primary determinant of intuitive or rational processing (e.g. Tversky & Kahneman, 1981). According to this viewpoint, it is possible that a less proficient L3 requires a much stronger cognitive effort (see for instance Cop, Drieghe, & Duyck, 2015), hereby depleting resources for rational thinking. We thus propose that the relationship between the FL effect and cognitive effort can be portrayed as an inverted U curve, similar to the Yerkes-Dodson law for the relationship between arousal and performance (Yerkes & Dodson, 1908). This account supposes that reasoning in L2 boosts rather than hinders rational thinking, because the more proficient L2 may increase cognitive effort without depleting cognitive resources. Rational processes may then be in charge of decision-making and the result will be more utilitarian responses. However, when cognitive effort exceeds a certain threshold, which may be the case when a less proficient L3 is employed, intuitive processes may take over once more and responses may become more deontological.



The aim of the current study was to investigate the role of emotion in decision-making further by manipulating the level of emotionality of the dilemmas. We selected three dilemmas that are considered to be personal (Greene et al., 2001) and with increasing levels of emotionality (confirmed by independent raters); namely *Footbridge*, *A Father's Choice*, and *Sophie's Choice* (see Materials). In *A Father's Choice*, a father has to make the decision on taking the death of his son into his own hands; in *Sophie's Choice*, a mother needs to decide between the lives of her two children. These two scenarios can be considered much more emotional, since the decision involves the protagonist's child(ren). However, in order to make the dilemmas comparable in terms of lives that can be spared, we included an adapted version of the *Footbridge*, in which only two people will die if the deontological option is chosen. This corresponds with the two deaths that will occur in *A Father's Choice* and *Sophie's Choice* (see Table 1 for an overview of possible outcomes). Additionally, we created an adapted version of *Sophie's Choice*, as the original one does not require the protagonist to take the action of killing themselves. In our new version, the mother will have to perform the deadly experiment herself. We also eliminated the 24-hour deadline, as the other dilemmas require instant decision. Consistent with the affective hypothesis (i.e. blunted deontology), we predict that the FL effect should be clearly visible in the *Classical Footbridge*, but to a smaller extent in *A Father's Choice*, and that it should vanish altogether in *Classical Sophie's Choice*. For the *Adapted Footbridge*, we expect a decrease in utilitarian responses, as there are fewer lives to be saved, but still an effect of FL. Similarly for *Adapted Sophie's Choice*, we believe fewer people will opt for the utilitarian option relative to the classical case, as this involves conducting the experiment

yourself. The dilemma might be considered even more emotional, thus we do not expect an FL effect.

Apart from employing these five dilemma conditions, we have also opted to include different FL conditions in the form of a second language (L2) and third language (L3) context. Since higher language proficiency is associated with more native-like emotional processing (Harris et al., 2006; Sianipar et al., 2015), the less proficient L3 should evoke even more emotional attenuation, as has been shown by Dewaele (2004), who found that participants gradually perceive swear and taboo words as less emotional in their third, fourth, and fifth language. This decrease in emotionality should, in turn, lead to attenuation of deontological considerations when making moral decisions, according to the emotional explanation of blunted deontology in FL decision-making. Moreover, we have also looked into gender-related moral judgment differences. In previous research by Fumagalli et al. (2010), men gave more utilitarian answers to personal moral dilemmas than women did, suggesting that the cognitive-emotional processes involved in evaluating personal moral dilemmas differ in men and in women, possibly reflecting differences in the underlying neural mechanisms (Fumagalli et al., 2010).

Finally, Geipel et al. (2015b) found that participants reported less confidence in their moral evaluations of private actions that are considered wrong (e.g. cheating on an exam) in the FL condition. The authors explained the outcome as a result of a reduction in ‘gut feeling’ about actions that generally elicit an aversive reaction. Still, other research has shown that deliberative thinking leads to greater confidence in judgment (Mata, Ferreira, & Sherman, 2013). Hence, we also included a confidence scale in the present study. If emotional attenuation is key to the FL effect and Geipel et al.’s theory about the lack of

‘gut feeling’ is correct, then participants in the FL conditions should be less confident about the choice they make.

Table 1. *Possible outcomes in terms of losses.*

	Losses	
	Deontological choice	Utilitarian choice
Classical Footbridge	5 strangers	1 stranger
Adapted Footbridge	2 strangers	1 stranger
A Father's Choice	1 relative + 1 stranger	1 relative
Sophie's Choice	2 relatives	1 relative
Adapted Sophie's Choice	2 relatives	1 relative

## Method

### *Participants*

Six hundred-twenty-four adults, recruited through several digital and non-digital platforms (e.g. classes, Facebook), volunteered to participate in our study. Although the dilemmas employed in this study can be considered quite grim, we were at the time not required to consult an ethical review board as we were working with healthy adult volunteers. Participants were required to be native speakers of Dutch, and have French and English as an L2 or L3. Age of acquisition (AoA) had to be reported for both these languages and participants also had to accredit themselves a proficiency score for each of the four language skills (listening, speaking, reading, and writing) on a scale ranging from 1 (= bad) to 7 (= native) (similar to studies such as Verreyt, Woumans, Vandelanotte, Szmalec, & Duyck, 2016). Participants also reported which of these languages they considered to be their L2 and L3. Their responses corresponded with their self-reported proficiency scores, as proficiency rates were significantly higher for L2. In order to assess

comprehension of the dilemma, participants answered a dilemma-specific content question (i.e. “How many people will die if you do nothing?”). Forty-seven participants were unable to answer the question correctly and they were excluded from the analysis. Another 20 participants were excluded for either not completing the background questionnaire ( $N = 4$ ), failing to respond to the dilemma or creating a third possible answer ( $N = 3$ ), indicating another language as Dutch as their native language ( $N = 10$ ), cooperating with another participant ( $N = 2$ ), or translating the entire scenario into their native language ( $N = 1$ ). Allocation of the remaining 557 participants to the different conditions is displayed in Table 2, including all group information.

Table 2. *Demographic data.*

	Classical Footbridge			Adapted Footbridge			A Father's Choice			Classical Sophie's Choice			Adapted Sophie's Choice		
	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
<i>N</i>	39	34	36	37	45	36	35	39	34	39	42	31	41	35	34
Age	20.7 (5.8)	20.6 (5.6)	22.0 (9.6)	38.8 (15.5)	35.8 (13.8)	42.6 (11.6)	20.8 (7.0)	23.0 (11.0)	21.5 (9.5)	22.5 (9.9)	22.8 (10.3)	19.2 (4.4)	33.6 (12.2)	33.5 (10.4)	34.4 (11.4)
Gender (M/F)	30/9	22/12	26/10	17/20	27/18	21/15	31/4	26/13	26/8	25/14	32/10	24/7	26/15	20/15	19/15
<b>L2</b>															
AoA	10.8 (2.6)	10.0 (3.9)	9.9 (3.9)	11.8 (3.7)	9.6 (3.7)	10.4 (3.7)	10.5 (3.7)	11.1 (2.7)	10.6 (2.7)	10.4 (3.1)	10.4 (3.1)	11.0 (3.3)	10.4 (3.4)	10.8 (2.7)	11.0 (3.1)
Comprehension	5.9 (0.8)	6.0 (1.1)	5.9 (0.9)	5.6 (0.7)	5.7 (0.7)	5.7 (0.8)	6.2 (1.0)	5.9 (1.2)	5.9 (0.9)	5.9 (0.9)	5.7 (1.1)	6.0 (0.7)	5.8 (0.7)	5.8 (0.6)	5.6 (0.7)
Speaking	5.4 (0.9)	5.4 (1.1)	5.3 (1.0)	5.1 (0.9)	5.0 (1.0)	5.4 (0.9)	5.6 (0.9)	5.3 (1.4)	5.3 (1.0)	5.2 (1.1)	5.1 (1.2)	5.1 (1.0)	5.6 (0.8)	5.5 (0.7)	5.3 (0.8)
Reading	5.9 (0.8)	5.7 (1.1)	5.9 (0.9)	5.5 (0.8)	5.5 (0.9)	5.6 (0.9)	6.0 (1.0)	5.6 (1.2)	5.8 (0.8)	5.7 (1.2)	5.8 (1.1)	5.9 (0.7)	5.7 (0.7)	5.9 (0.6)	5.7 (0.8)
Writing	5.2 (0.7)	5.2 (1.2)	5.3 (0.8)	5.1 (0.9)	4.9 (1.0)	5.3 (0.8)	5.2 (1.1)	5.1 (1.4)	5.3 (0.8)	5.1 (1.1)	5.1 (1.1)	5.0 (1.0)	5.3 (0.8)	5.4 (0.7)	5.2 (1.1)
<b>L3</b>															
AoA	10.3 (2.0)	9.8 (2.6)	9.8 (2.7)	10.2 (3.1)	10.1 (1.8)	10.3 (2.9)	10.1 (1.9)	10.6 (1.5)	10.6 (1.3)	10.3 (1.5)	10.4 (2.0)	9.6 (2.2)	10.1 (1.7)	9.6 (2.3)	10.6 (2.0)
Comprehension	4.3 (1.4)	4.5 (1.5)	4.8 (1.0)	4.5 (1.1)	4.5 (0.9)	5.0 (0.9)	4.5 (1.2)	4.1 (1.7)	4.4 (1.2)	4.3 (1.4)	4.2 (1.6)	4.5 (0.9)	4.4 (1.1)	4.3 (1.2)	4.5 (0.9)
Speaking	3.8 (1.2)	3.8 (1.3)	3.9 (1.4)	4.2 (1.2)	4.0 (0.9)	4.4 (1.0)	3.9 (1.3)	3.5 (1.6)	3.7 (1.4)	3.5 (1.6)	3.7 (1.3)	3.6 (1.2)	3.7 (0.9)	3.7 (1.0)	4.1 (0.9)
Reading	4.6 (1.2)	4.5 (1.2)	4.7 (1.3)	4.6 (1.1)	4.5 (0.9)	4.2 (1.1)	4.3 (1.5)	4.3 (1.6)	4.4 (1.2)	4.2 (1.6)	4.4 (1.2)	4.5 (1.0)	4.3 (1.3)	4.5 (0.9)	4.6 (0.9)
Writing	3.7 (1.2)	4.1 (1.2)	3.9 (1.5)	4.0 (1.1)	3.7 (0.9)	4.6 (0.9)	3.8 (1.4)	3.6 (1.4)	3.7 (1.2)	3.5 (1.6)	3.7 (1.3)	3.6 (1.3)	3.6 (1.0)	3.6 (1.1)	3.7 (0.9)

### *Materials and procedure*

All participants were given one of five dilemmas (see Appendix) either in Dutch, English, or French, and the instruction to choose one of two available actions; a utilitarian and a deontological one. Participants were randomly assigned to a condition. In total, 191 participants completed the L1 (Dutch) condition, 195 the L2 condition (for 176 this was English, for 19 this was French), and 171 the L3 condition (for 22 this was English, for 149 this was French). The dilemma was accompanied by a black-and-white drawing, partially depicting the scenario, as a visual aid. After choosing either the utilitarian or the deontological response, participants also had to respond to a content question (i.e. “How many people will die if you do nothing?”) and were asked to indicate on a scale ranging from 0 (= absolutely not confident) to 5 (= absolutely confident) whether they felt confident that the action they chose was the right one. The translations in Dutch and French were created to be as true to the original English text as possible, also with respect to grammar and sentence structure. We selected the three original dilemmas that are considered to be personal but also differ in level of emotionality and added two adapted versions. To ascertain that the stories indeed had a different emotional tone, we collected additional emotionality ratings for the original dilemmas. Ninety-one independent raters, who did not participate in the actual study, confirmed our manipulation. These raters read the three dilemmas in either their L1 ( $N = 37$ ), L2 ( $N = 29$ ), or L3 ( $N = 25$ ). First, they were asked to give each dilemma an emotional score ranging from 1 (= not emotional at all) to 7 (= very emotional). Analyses of variance showed a significant difference between emotionality ratings ( $F_{2, 88} = 4552, p < .001, \eta^2 = .994$ ). *Sophie’s Choice* was rated as the most emotional ( $M = 6.7, SD = 0.6$ ), followed by *A Father’s Choice* ( $M = 6.3, SD = 1.0$ ) and

*Footbridge* ( $M = 4.6$ ,  $SD = 1.6$ ). Planned comparisons showed that the difference was significant between all dilemmas (all  $ps < .001$ ). There was no effect of the language (L1, L2, or L3) in which the raters read the dilemmas (*Footbridge*:  $F_{2, 88} = 0.52$ ,  $p = .598$ ; *Father's Choice*:  $F_{2, 88} = 0.24$ ,  $p = .784$ ; *Sophie's Choice*:  $F_{2, 88} = 1.04$ ,  $p = .359$ ). Important to note is that these raters were only presented with the scenario and were not asked to respond to it, hence no moral foreign language effect was expected in their responses. The fact that there were no differences between languages for emotional ratings suggests that our raters were not emotionally 'impaired' by the use of another language (see also Iacozza, Costa, & Duñabeitia, 2017; Winkel, 2013).

## Results

### *Demographics*

Demographic comparisons completed by running multiple ANOVAs determined there were no differences between groups of participants randomly assigned to one of five dilemma conditions with regard to L2 and L3 AoA and proficiency (all  $ps > .1$ ). Language skills were represented by a composite proficiency score, created by averaging the self-reported ratings for the four skills. There was, however, an accidental difference for age ( $F_{4, 549} = 72.59$ ,  $p < .001$ ,  $\eta^2 = .352$ ) and gender, entirely driven by *Adapted Footbridge* and *Adapted Sophie's Choice*, where participants were older and the male/female ratio more evenly distributed. Values are reported in Table 2. No differences were found between participants over the three language conditions, nor over language condition per dilemma. Regarding the comparison of L2 vs. L3, paired samples exposed a significant difference in skill proficiency (L2:  $M = 5.5$ ,  $SD = 0.8$ ; L3:  $M = 4.1$ ,  $SD = 1.1$ ) across all

participants ( $t_{556} = 28.33, p < .001$ ). When splitting the data for language condition and dilemma, the test remained significant ( $p < .001$ ). This indicates that proficiency was much better for L2 than for L3, which is necessary for our investigation. Performing the same analyses for L2 AoA ( $M = 10.6, SD = 3.3$ ) vs. L3 AoA ( $M = 10.2, SD = 2.2$ ) showed that L3 AoA was slightly earlier than L2 AoA ( $t_{549} = 2.38, p = .018$ ). However, when split for language and dilemma condition, the difference was only significant in the L1 Dutch condition of the *Adapted Footbridge* ( $t_{35} = 2.82, p = .008$ ). Here, participants reported earlier acquisition for L3 ( $M = 10.2, SD = 3.2$ ) than for L2 ( $M = 11.8, SD = 3.7$ ).

### *L1 versus FL*

As our assumption was that FL processing leads to a decrease in deontological responses (i.e. blunted deontology), analyses were performed on the percentages of deontological answers (Table 3). Overall, across the five dilemmas, participants were more likely to respond in a deontological manner (61%). As expected, L1 showed the highest percentage of deontological choices (65%) compared to FL (59%), which was a score created by combining the proportions of L2 and L3. Using a binomial test with the proportions of choices in L1 as a baseline to determine the FL effect, we found that decisions were significantly less deontological in FL (with a decrease of 6%;  $B(366, 0.65), p = .013$ ).

Further analyses were performed on the number of deontological responses per dilemma. For *Classical Footbridge*, *Footbridge* being considered the least emotional dilemma, we discovered a significant difference of 16% between L1 (77%) and FL (61%) ( $B(70, 0.77), p = .003$ ). In the adapted version of *Footbridge*, the difference of 7% between L1 (97%) and FL (90%) was also significant ( $B(81, 0.97), p = .003$ ). For *A Father's*



*Choice*, we uncovered a 10% difference between L1 (63%) and FL (53%), which was not significant at the .05 level ( $B(73, 0.63), p = .059$ ). Regarding the highly emotional *Sophie's Choice* dilemmas, we found no difference (1%) between L1 (49%) and FL (48%) ( $B(73, 0.49), p = .475$ ) for *Classical Sophie's Choice*. In *Adapted Sophie's Choice*, the difference of 4% between L1 (44%) and FL (40%) was also not significant ( $B(69, 0.44), p = .245$ ).

Because of the gender ratio imbalance, we ran an additional analysis using the Cochran-Mantel-Haenszel method to test for an association between choice and language condition (native or foreign), taking gender into account as a covariate. This showed no significant effects of gender.

#### *L1 versus L2 and L3*

Looking at the percentage of deontological responses across dilemmas, we observed a 5%-difference between L1 (65%) and L2 (60%), which was not significant at the .05 level ( $B(195, 0.65), p = .083$ ). Between L1 and L3 (58%), the 8%-difference was significant ( $B(171, 0.65), p = .045$ ). Looking at specific dilemmas (see Table 3), we found a strong 18%-difference between L1 and L2 ( $B(34, 0.77), p = .014$ ), and a 13%-difference between L1 and L3 ( $B(36, 0.77), p = .052$ ) in *Classical Footbridge*. In *Adapted Footbridge*, the 1%-difference between L1 and L2 was not significant ( $B(45, 0.97), p = .393$ ), but there was a considerable 14%-difference between L1 and L3 ( $B(36, 0.97), p = .001$ ). In *A Father's Choice*, there was no significant difference (7%) between L1 and L2 ( $B(39, 0.63), p = .244$ ), and a 13%-difference which was not significant between L1 and L3 ( $B(34, 0.63), p = .083$ ). In *Classical Sophie's Choice*, L1 did not differ from L2 (1%;  $B(42, 0.49), p = .509$ ) or from L3 (4%;  $B(31, 0.49), p = .403$ ). In *Adapted Sophie's Choice*, there was a

difference of 13% between L1 and L2 which turned out not to be significant ( $B(35, 0.44)$ ,  $p = .091$ ), and again no difference between L1 and L3 (3%;  $B(34, 0.44)$ ,  $p = .424$ ).

### *L2 versus L3*

In order to see whether replies in L3 differed from L2, the same analyses were performed, but with L2 proportions of choices as baseline. There was a significant difference in *Adapted Footbridge* (13%;  $B(36, 0.96)$ ,  $p = .003$ ) and in *Adapted Sophie's Choice* (16%;  $B(34, 0.31)$ ,  $p = .036$ ). No other differences were found (all  $ps > .296$ ).

In addition, we ran point-biserial correlations between FL proficiency/FL AoA and choice (0 = deontological, 1 = utilitarian). As the proficiency and AoA variables were all negatively skewed, we performed bootstrapping with 1k bootstrap replicates. We split up the FL data for L2 and L3 and found no correlations. Of course, the variance for these variables was limited. After splitting up for dilemma, we did uncover a negative correlation between L2 AoA and choice in the L1 condition of the *Classical Footbridge* dilemma ( $r = -.364$ ,  $p = .023$ , Bootstrap 95% CI [-.667, .058]) and between L3 AoA and choice in the L2 condition of *A Father's Choice* ( $r = -.335$ ,  $p = .037$ , Bootstrap 95% CI [-.412, .396]), where earlier AoA was associated with more deontological responses.

Table 3. *Percentage of deontological responses split for dilemma and language.*

	L1	L2	L3
<i>Footbridge</i>	77	59	64
<i>Adapted Footbridge</i>	97	96	83
<i>A Father's Choice</i>	63	56	50
<i>Sophie's Choice</i>	49	50	45
<i>Adapted Sophie's Choice</i>	44	31	47

### *Confidence*

When asked how confident they were about their choice, participants tended to respond with more certainty when making a deontological decision ( $M = 3.57, SD = 1.60$ ) than a utilitarian one ( $M = 2.71, SD = 1.58$ ) ( $F_{1, 556} = 7.78, p = .005, \eta^2 p^2 = .015$ ). There was also an effect of dilemma ( $F_{4, 556} = 6.55, p < .001, \eta^2 p^2 = .047$ ), which was entirely driven by the *Adapted Footbridge* dilemma, in which participants were more confident of their choice ( $M = 4.57, SD = 1.27$ ) than in any other dilemma (all  $ps > .001$ ). There was no effect of language condition, nor an interaction between choice and one of these two conditions. All other interactions were also non-significant.

### **Discussion**

A fairly new line of research has suggested that the use of a foreign language (FL) relative to the native language (NL) may lead to a more deliberative way of thinking, impeding considerations of deontological rules (Hayakawa et al., 2017; Muda et al., 2017). The current study set out to investigate the role of emotional attenuation and the effect of language proficiency more thoroughly. It should, however, be noted that language proficiency was obtained through self-report measures and not via language tests. We employed five personal dilemmas with varying levels of emotionality, supposing that the FL effect would decrease as the levels of affect increased. By employing a second language as well as a third language condition, we were also able to verify an implicit assumption of the affective hypothesis, namely that an FL yields less emotion, resulting in more utilitarian choices when the FL is less proficient (see also Harris et al., 2006; Sianipar et al., 2015;

Sutton et al., 2007). Alternatively, we reasoned that higher cognitive demands for the less proficient language (e.g. Cop et al., 2015) could also have the opposite effect, if lower proficiency depletes the necessary resources for utilitarian decisions completely. Finally, we asked participants how confident they were about their decision; hypothesising responses might differ for NL and FL.

### *Native versus foreign language*

The results of our study mirrored those of previous research demonstrating an FL effect in the original *Footbridge* dilemma (e.g. Cicolletti et al., 2016; Corey et al., 2017; Costa et al., 2014; Geipel et al., 2015a). Here, deontological responses decreased by 16% in the FL. Furthermore, we observed a similar pattern in an adapted version of *Footbridge*, in which the losses when choosing the deontological option were minimised from five to two. Although deontological responses were in general much higher in the adapted version than in the original formulation (97% versus 77% for L1), the FL effect was still strongly present with a difference of 7%. In the more emotional *A Father's Choice*, the FL effect was not found to be significant. For both versions of the increasingly emotional *Sophie's Choice*, no differences were found between languages.

The fact that we found a significant FL effect only in the *Footbridge* was in unison with what we hypothesised. It appears that the more emotional a decision gets, the less emotional attenuation will play a role. This becomes very obvious for the most emotional dilemmas, i.e. both versions of *Sophie's Choice*, where there was no distinction at all between the two language conditions. Taking these results together with the previous finding that an FL does not yield fewer deontological responses in impersonal dilemmas (Costa et al., 2014), it is possible that the FL effect follows a U-shape pattern when

emotionality of the problem increases. Another plausible explanation for these findings, which has not been previously explored, is that the FL effect only occurs in dilemmas with high response agreement. To demonstrate, in the personal dilemma *Footbridge* around 80% chooses the deontological response when it is formulated in the NL, and an effect of FL is often reported (Cipolletti et al., 2016; Corey et al., 2017; Costa et al., 2014; Geipel et al., 2015a). Similarly, in the impersonal (i.e. not emotional) dilemma *Lost Wallet* around 84% opts for the deontological response, and again, an FL effect is reported (Geipel et al., 2015a). Conversely, in *Crying Baby*, a highly personal and emotional dilemma, only 40% settles on the deontological response, and no FL effect is found (Geipel et al., 2015a). Our own data seems to consolidate this hypothesis, as we found a clear FL effect in *Adapted Footbridge* (97% agreed upon the deontological response) and a marginal one in *A Father's Choice* (63%), but no effect in *Sophie's choice* (only 49%). A notable exception is the *Switch* dilemma (see Costa et al., 2014); yet, agreement here lies with the utilitarian response (81%) and not the deontological one, whereas use of an FL is believed to stunt deontology (Hayakawa et al., 2017). Since the percentage of deontological responses was already at floor level in the NL, finding an FL effect would nigh be impossible.

Although this hypothesis is formulated independently from the emotionality account, it is certainly conceivable that the two are related. For instance, highly emotional dilemmas, such as *Crying Baby* and *Sophie's Choice*, may automatically cause more variance in responses. Hence, this raises the question whether 'agreement dilemmas' in some way differ from other dilemmas (i.e. content-wise, so that more people opt for a certain response) and if this is either related or unrelated to emotionality; or whether the observed effects are attributable to statistical artefacts, where a lack of variance in response

leaves more room for attenuation of deontology as a result of using an FL. Further research into the effect of ‘agreement dilemmas’ versus others is needed to further corroborate this possibility.

#### *Distinguishing second from third language*

Analysing the data separately for second (L2) and third (L3) language, the FL effect in *Classical Footbridge* was visible for both relative to L1, whereas it was only observed for L3 in *Adapted Footbridge*. For all other dilemmas, splitting up the data did not reveal any significant differences. These results are not in line with the hypothesis that L3 use imposes such high cognitive demands that relying upon deliberative reasoning becomes adamant, but rather substantiate the supposition that the FL effect relies on emotional attenuation, as emotional processing is distinct for languages with varying levels of proficiency (Dewaele, 2004; Harris et al., 2006). It seems that in this version of the *Footbridge*, where consensus over the deontological option was extremely high, only L3 diminished deontological concerns enough to make participants choose the utilitarian option. This once more fortifies our belief that the FL effect is caused by an interaction between emotional attenuation and response variance.

Looking at these results, a correlation between FL proficiency and type of choice could be expected, with higher proficiency leading to more deontological responses. We did not find such association in our data. Still, it must be noted that proficiency variance within both the L2 and L3 condition was limited, which makes it difficult to observe any correlations. We did, however, uncover a negative correlation between age of L2 acquisition and choice in the L1 condition of the *Footbridge* and between age of L3 acquisition choice in the L2 condition of *A Father’s Choice*, suggesting that an earlier L2

AoA decreases deontology in the NL. This result was rather unexpected in light of previous findings (Dewaele, 2004; Harris, 2004; Harris, Gleason, & Ayçicegi, 2006). However, it may indicate that learning an FL (especially at an early age) shapes judgment in general and raises the question of whether monolinguals in their NL would make fewer utilitarian decisions than bilinguals in their NL. Future research may provide clarity on this issue.

#### *Gender-related differences*

Contrary to what was found in earlier research by Fumagalli et al. (2010), we were not able to detect gender-driven differences in the current study. Hence, we were not able to confirm the hypothesis that the cognitive-emotional processes involved in evaluating personal moral dilemmas differ in men and in women, possibly reflecting differences in their underlying neural mechanisms (Fumagalli et al., 2010). There was, however, an accidental difference for age and gender, entirely driven by *Adapted Footbridge* and *Adapted Sophie's Choice*, where participants were older and the male/female ratio more evenly distributed.

#### *A matter of confidence*

Our results also revealed that participants who gave a deontological response were more confident about their decision. This contradicts Mata et al. (2013), who proposed that deliberative thinking increases confidence. Our finding is, however, in line with the suggestion made by Geipel et al. (2015b) that 'gut feeling', or in other words 'intuition', makes people more confident about the choices they make. Yet, in our case, this was not dependent on language condition. In other words, although participants opted less often for the deontological option in the FL conditions than for the utilitarian one, it did not mean

they were more uncertain about their choice than participants in the NL conditions who also gave a utilitarian response.

### *Emotional attenuation, not impairment*

This study adds to the existing evidence that use of an FL stunts emotional processing, but also proposes a role of response agreement in responses to dilemmas. Important to note is that emotional attenuation in moral judgment is only seen in the application of deontological rules. In fact, in the current study an interesting contrast appeared between the explicit assessments of dilemma emotionality (by independent raters) and the implicit impact of emotionality that drove decisions in the dilemmas. In the explicit emotionality ratings, no differences between NL and FL were found. Similarly, other studies also found no differences between the NL and FL for emotionality ratings, but only for behavioural measures of emotional arousal (Iacozza et al., 2017; Winskel, 2013). This indicates that the explicit and deliberate evaluation of emotional content is not impaired during FL processing and that readers of the FL dilemmas are perfectly aware of its ramifications. This has even become clear in a study on crime judgment, where crime accounts described in the FL were systematically evaluated as less severe compared with the same cases described in the NL (Woumans, Van der Cruyssen, & Duyck, 2020).

## **Conclusion**

Building on previous research into the moral foreign language effect, the aim of the current study was to further investigate the role of emotion in decision-making by manipulating the level of emotionality in different moral dilemmas. Our participants were



presented one of five dilemmas with varying degrees of emotionality in one of three different language conditions (first, second, and third language), and asked to choose between a utilitarian and a deontological response. We considered gender-related differences and looked at correlations between participants' confidence levels and their response types.

Our results revealed that decisions in a foreign language indeed tend to be less deontological, and hence more deliberative. Still, for the most emotional dilemmas, the effect was absent. Overall, the effect was not more prominent in the third versus the second language, indicating that the former does not impose such high cognitive demands that it increases deliberative reasoning. Rather, our findings substantiate the supposition that the FL effect relies on emotional attenuation, regardless of lower language proficiency. Furthermore, participants were more confident about their deontological choice than about their utilitarian one.

We believe this study contributes to the field in that it further differentiates the conditions for a foreign language effect to appear, looking both at languages with varying degrees of proficiency and dilemmas with varying levels of emotionality. In future research, especially the role of response agreement in moral dilemmas deserves more attention.

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## Appendix

*Classical Footbridge.* “A runaway trolley is heading down the tracks toward five workmen who will be killed if the trolley proceeds on its present course. You are on a footbridge over the tracks, in between the approaching trolley and the five workmen. Next to you on this footbridge is a stranger who happens to be very large. The only way to save the lives of the five workmen is to push this stranger off the bridge and onto the tracks below where his large body will stop the trolley. The stranger will die if you do this, but the five workmen will be saved. What would you do?” Response options were “I would push the man” and “I would not push the man”.

*A Father’s Choice.* “You are an inmate in a concentration camp. A sadistic guard is about to hang your son who tried to escape and wants you to pull the chair from underneath him. He says that if you don’t he will not only kill your son but some other innocent inmate as well. You don’t have any doubt that he means what he says. What would you do?” Response options were “I would pull the chair” and “I would not pull the chair”.

*Classical Sophie’s Choice.* “It is wartime and you and your two children, ages eight and five, are living in a territory that has been occupied by the enemy. At the enemy’s headquarters is a doctor who performs painful experiments on humans that inevitably lead to death. He intends to perform experiments on one of your children, but he will allow you to choose which of your children will be experimented upon. You have twenty-four hours to bring one of your children to his laboratory. If you refuse to bring one of your children to his laboratory he will find them both and experiment on both of them. What would you do?” Response options were “I would choose a child” and “I would not choose a child”.



*Adapted Footbridge.* “A runaway trolley is heading down the tracks toward two workmen who will be killed if the trolley proceeds on its present course. You are on a footbridge over the tracks, in between the approaching trolley and the two workmen. Next to you on this footbridge is a stranger who happens to be very large. The only way to save the lives of the two workmen is to push this stranger off the bridge and onto the tracks below where his large body will stop the trolley. The stranger will die if you do this, but the two workmen will be saved. What would you do?” Response options were “I would push the man” and “I would not push the man”.

*Adapted Sophie’s Choice.* “It is wartime and you and your two children, ages eight and five, are living in a territory that has been occupied by the enemy. At the enemy’s headquarters is a doctor who performs painful experiments on humans that inevitably lead to death. He wants you to perform an experiment on one of your children and allows you to choose which one. The child will die as a result. If you refuse to choose, the doctor will perform the experiment himself on both your children, and they will both die.” Response options were “I would choose a child” and “I would not choose a child”.