Foreign Language Effects on Judgment and Decision Making

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Abstract

I present four studies in which my coauthors and I investigated whether presenting information in a foreign language, as opposed to the native language, influences judgment and decision-making. Research on judgment and decision-making suggests that there are two routes to judgment and choice: an intuitive, emotional route and an analytic, controlled route. Research on bilingualism suggests that the use of a foreign language influences the intuitive route. It attenuates emotions and dampens the activation of moral and sociocultural norms. Merging these lines of research, my coauthors and I predicted that foreign language would influence judgment and decision-making. We found that it influences moral judgment through a deactivation of moral norms, and that it affects the perception of risk and benefit through an attenuation of negative feelings. I discuss the theoretical and practical significance of the present findings, and point out limitations and possible future developments of this research area.

Contents

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Chapter 1

Introduction

The use of a foreign language has become a commonplace activity for millions of people in our globalized society. People, for example, share their lives with romantic partners who do not speak their native language, and work in international companies that implement common language policies. As a result, people frequently engage in verbal and written communications, such as discussions, reports, or emails, in a foreign language. This essay explores whether processing printed information in a foreign language, as opposed to a native language, influences judgment and decision-making in the domains of moral reasoning and risk perception. By foreign language, as I will use the term, I denote a language that is learned and used "outside the environment where the majority of the speakers use it as a native language" (Pavlenko, 2012, p. 407).

The fashion photographer Helmut Newton, born and raised in Berlin, Germany, once had the opportunity to meet the former German chancellor for dinner. But Helmut Newton confused the dates and showed up a day later. In his handwritten apology letter he stated, "I am too upset to write in German. I can only think in English at this moment and I don't expect to ever be forgiven." Helmut Newton's comment illustrates that the use of a foreign language may trigger psychological distance. This could be because the use of a foreign language attenuates emotion (for reviews see, Pavlenko, 2012; Caldwell-Harris, 2014, 2015). Helmut Newton presumably felt embarrassed and angry with himself. By writing (thinking) in a foreign language he attenuated the negativity of those feelings. It could also be that relevant sociocultural norms, such as keeping promises and coming to appointments, are less salient when thinking in a foreign language (see e.g., Gawinkowska,

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Paradowski, & Bilewicz, 2013). By thinking in a foreign language, Helmut Newton's norm violation became more bearable. But why should emotion attenuation and/ or a suppression of sociocultural norms influence judgment and decision-making?

Theories of judgment and decision-making advocate dual-process models (e.g., Evans, 1989, 2007; Kahneman & Frederick, 2002; Stanovich,1999, 2004, 2009; Sloman, 1996). According to these models judgments and decisions are the result of two types of psychological processes: one which is intuitive, parallel, automatic, and unconscious and another which is controlled, serial, slow, and conscious. Importantly, intuition has been shown to impact judgment and decision-making through gut-feelings and norms (Kahneman, 2011). To the extent, therefore, that foreign language attenuates emotions and norms it might impact judgments and choices. In the present essay I provide empirical support for this hypothesis. I will show that the use of a foreign language influences moral judgment by reducing access to relevant sociocultural and moral norms. I will also show that it influences risk and benefit perception through affect.

In the remainder of Chapter 1, I will review research on bilingualism concerning emotion and norm activation. I will also review theories of judgment and decision-making in the domains of moral judgment and risk and benefit perception. The purpose of Chapter 1 is to give an overview of the theoretical basis of the present research. Chapters 2, 3, and 5 are reproductions of research articles that I published during my doctoral studies (Geipel, Hadjichristidis, & Surian, 2015; Geipel, Hadjichristidis, & Surian, 2015; Hadjichristidis, Geipel, & Savadori, 2015) while Chapter 3 is a reproduction of a research article that is currently under review. Chapter 6 is a general discussion in which I summarize the results and arguments in this essay. In Chapter 6, I also allude to practical implications of the present findings.

Research on foreign language processing

More than 100 years ago, Freud noticed that the use of foreign language might trigger emotional distance. He discussed the case of a multilingual patient, Anna O., who lost her mother tongue for eighteen months and spoke only in her foreign languages (Freud, 1893). Later in the 1990s, applied psycholinguistics investigated the relationship between bilingualism and emotion by conducting one of the largest online surveys to date (Dewaele, 2008; Pavlenko, 2005). Based on 1579 respondents, these researchers found that emotional sentences, such as "I love you", were perceived as more emotional when printed in the native language rather than in a foreign language. Similar results were found for taboo and swear words. In the context of consumer research, Puntoni and colleagues (Puntoni, de Langhe, & van Osselaer, 2009) studied the emotional intensity of marketing slogans, such as "Parents who use drugs have kids who use drugs." Participants perceived the slogans as more emotional when these were printed in their native language.

Laboratory experiments further supported these self-report findings. For example, Bond and Lai (1986) found that native Chinese speakers discussed longer about embarrassing topics in a foreign language (English) as compared to their native language. Bond and Lai explained their findings by suggesting that foreign language acts as a distancing mechanism. Harris and colleagues (Harris, Ayçiçegi, & Gleason, 2003) presented (auditorially) childhood reprimands, such as "Shame on you" and "Don't do that", either in the participants' native language (Turkish) or in a foreign language (English). They found that childhood reprimands elicited stronger skin conductance reactions when they were presented in the native language as opposed to a foreign language.

In a different study, Caldwell-Harris and Aycicegi-Dinn (2009) presented participants with false-statements either in the participants' native language (Turkish) or a foreign language (English). Participants who received these statements in their native language showed greater skin-conductance responses for false-statements with moral content as compared to statements with neutral content. However, this content related emotional difference was not found in the foreign language condition (see Caldwell-Harris, 2015). Foreign language blunted the physiological reactivity to both moral and non-moral statements.

Although there is a wealth of studies demonstrating an emotional advantage of the native language, several have failed to find such a difference. One such study is Conrad and colleagues' research (Conrad, Recio, & Jacobs, 2011) with native German and native Spanish speakers. While the participants performed a visual lexical decision task either in the native or a foreign language, the researchers measured the participants' event related potential (ERP) waves. They found that the ERP waves were similar in both language conditions. This suggests that emotional words are processed similarly in both the native and the foreign language.

In line with this finding, Opitz and Degner (2012) showed amplified ERP waves for emotional words when these were presented in either the native language (German or French) or a foreign language (French or German). However, while the ERP waves did not differ in amplitude, they differed in onset; their onset was delayed when the emotional words were presented in the foreign language. This suggests that emotional words are less automatically processed in the foreign than in the native language.

One explanation for these mixed findings is that the greater emotional reactions related to the native language might depend on a complex interplay of

factors such as age of acquisition, proficiency, and context of use of the foreign language (e.g., Caldwell-Harris, 2015; Caldwell-Harris, Staroselsky, Smashnaya, & Vasilyeva, 2012; Dewaele, 2010; Puntoni et al., 2009). In other words, using and experiencing a foreign language in everyday life through social interactions can reduce the emotional differences between the native and a foreign language. For this reason, in the present experiments we interviewed participants who have learned the foreign language in a classroom context. We excluded ones who have learned it through immersion in a culture.

A further source for the inconsistent findings is that the use of a foreign language might have opposite influence on positive and negative emotion words (Caldwell-Harris, 2015; Pavlenko, 2012). Specifically, it might attenuate the negativity of negative words, but increase (or leave unaffected) the positivity of positive words. Support for this claim comes from neuroscience research. Wu and Thierry (2012) found that positive or neutral words in the foreign language automatically trigger their native language translations. However, this was not the case for negative words. These authors claimed that negative words trigger inhibitory mechanisms that block access to their native language equivalents. As Wu and Thierry eloquently put it, foreign language protects our hearts.

In line with this research, Sheikh and Titone (2015), using eye-tracking methods, demonstrated that positive words are read more quickly as compared to neutral words in both the native language *and* the foreign language. However, this emotional processing advantage was absent for negative words in the foreign language. These authors suggested that the emotional processing advantage for positive words in both the native and a foreign language could be because positive words have more opportunities in adult interaction to be emotionally grounded. In

contrast, negative words might have fewer opportunities for emotional grounding because a foreign language is typically learned at a later point in life. Critically, a foreign language is experienced through adult interactions that have been shown to exhibit a positivity bias (see the Polyanna Principle by Matlin & Stang, 1978; see also Dodds et al., 2015).

Yet another explanation of these incompatible findings comes from research on the use of swear words in a foreign language. Gawinkowska et al. (2013) asked native Polish speakers to translate passages of texts either from their native language into their foreign language or vice versa. These authors found that translating foreign language swearwords into the native language resulted into *weaker* swearword translations, whereas translating native language swear words into the foreign language resulted in *stronger* translations than in the original version. Importantly, this effect was confined to politically incorrect, insulting words directed against social groups. It was not observed for other swearwords. The authors concluded that foreign language does not facilitate the use of swearwords because it attenuates their emotionality, but rather because it inhibits the activation of relevant social norms. In a foreign language people are less inhibited from using 'taboo' swearwords.

Gawinkowska and colleagues' proposal is in line with Bond and Lai's (1986) research. It could be that the use of a foreign language lightens the sociocultural "baggage" that is associated with the native language. This would explain why people discuss relatively longer about embarrassing topics in a foreign as compared to their native language. It would also explain why swearing in a foreign language is perceived as less wrong, especially for ethnic groups for which the use of swear words is strongly stigmatized, such as for Asians (Dewaele, 2010). Furthermore, it could explain why psychotherapy patients preferred to use a foreign language to avoid

anxiety-provoking topics (Freud, 1893). Finally, it could also explain why Helmut Newton preferred to write his apology letter in English.

In sum, empirical evidence suggests that the use of a foreign language might attenuate emotions and in particular negative emotions. Research also shows that foreign language might attenuate moral and sociocultural norms. In the next two sections, I discuss theories of judgment and decision-making and explain how emotions and norms can influence these activities. In the section directly below I focus on moral judgment while in the following section on risk and benefit perception. Parts of these theories and supporting empirical evidence are covered in the papers presented in Chapters 2 to 5. My purpose here is to offer the reader with a more extensive overview.

Intuition and reasoning in moral judgment

How do people judge the ethicality of their own and others' behaviours? This question has divided psychologists for a long time. Historically, there were two prevalent views. One assumed that moral judgment is the result of controlled, conscious processing (e.g., Piaget, 1965; Kohlberg, 1969) while another that it is the result of intuitive, unconscious processing (e.g., Freud, 1955). In the last decades, research suggests that moral judgment is the result of *both* intuitive and controlled processing, but intuition sometimes dominates.

The social intuitionist model (e.g., Haidt, 2001) suggests that moral judgment is based predominantly on intuitions. These intuitions are triggered automatically by good or bad actions that are evaluated in relation to, for example, sociocultural and moral norms. In the aftermath, people can engage in controlled and conscious moral reasoning and may even change their initial intuitive moral response. Support for this model comes from studies, which show that participants judge harmless but offensive

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actions (consensual and safe incest between siblings) as morally wrong. When the participants are asked to justify their moral evaluations, most are unable to provide justifications (e.g., Haidt, Koller, & Dias, 1993; Haidt, & Bjorklund, 2008), a condition known as *moral dumbfounding* (Haidt, Bjorklund, Murphy, 2000). This is interpreted as evidence that moral judgments are driven by intuition rather than by reason. If they were driven by reason then participants should be able to justify them.

In contrast to Haidt's social intuitionist model, dual process models of moral reasoning (e.g., Cushman, 2013; Greene, Morelli et al., 2008; Greene, Sommerville et al., 2001) suggest that moral judgment is the result of intuitive *and* controlled processing. Intuitive processing supports deontological type judgments, whereas controlled processing supports consequentialist type judgments. Deontological type judgments are defined as "judgments that focus on the rights and duties of others and are difficult to justify in consequentialist terms, such as killing one life in order to save a greater number of lives" (see Greene, 2014, p.7). Consequentialist type judgments are defined as "engaging in cost-benefit reasoning and are more difficult to justify in deontological terms" (see Greene, 2014, p. 8). A typical consequentialist type judgment in the vein of Greene's dual process model would be killing one person in order to save five others.

The dual process model of moral judgment was inspired by research on the trolley dilemmas. In the *trolley* problem participants are asked to imagine a runaway trolley that is about to kill five workers that are standing on the track. There is the possibility to hit a switch that will divert the trolley onto a different track where it will kill one worker but the five will be saved. Participants are asked whether it would be morally acceptable for them to hit the switch. In the *footbridge* problem the situation is similar but here the only way to save the five workers is to push a person off a

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bridge and into the path of the runaway trolley. This would kill the person but save the five workers. Participants are asked whether it would be okay for them to push the person. In the trolley problem most people *accept* the proposed action—hitting a switch—thus making a consequentialist type judgment. In the footbridge problem most people *refuse* the proposed action—pushing a person—thus making a deontological type judgment. Why do people respond differently?

In an attempt to explain the underlying mechanisms of people's choices in these dilemmas, Greene and colleagues conducted a study using functional measurement resonance imaging (fMRI; Greene et al., 2001). Participants responded to a series of moral dilemmas, of the same type as the footbridge and the trolley problems, while the authors measured the participants' neuronal activity. The results showed that footbridge type dilemmas increase neuronal activity in areas that are typically associated with social and emotional processing. In contrast, trolley type dilemmas increase neuronal activity in areas that are typically associated with working memory. These findings support the idea that deontological type judgments are most likely driven by intuitive processing, whereas consequentialist type judgment by controlled processing (but see McGuire, Langdon, Coltheart, & Mackenzie, 2009). This idea was further supported in a series of studies examining patients with brain lesions in emotional centres of the brain (e.g., Ciaramelli & di Pellegrino, 2011; Ciaramelli, Muccioli, Làdavas, & di Pellegrino, 2007; Moretto, Làdavas, Mattioli, & di Pellegrino, 2010; Thomas, Croft, & Tranel, 2011; Koenigs et al., 2007). These patients, in comparison to controls, demonstrated increased consequentialist type choices in response to footbridge type dilemmas.

However, recent studies have challenged this dual process conceptualisation proposed by Greene and colleagues (e.g., Greene et al., 2008). Specifically, they have

contested the idea that consequentialist judgments are necessarily the products of controlled processing. For example, Duke and Bègue (2015) demonstrated that alcohol intoxication is positively associated with consequentialist type judgments. This is surprising because alcohol intoxication is known to increase emotional reactivity (Euser & Franken, 2012; Giancola, Josephs, Parrott, & Duke, 2010; Ray, Mun, Buckman, Udo, & Bates, 2012; Sayette et al., 2012) and to deplete cognitive resources (Giancola, 2000), and therefore the ability to reason. The dual process model of moral judgment would thus predict that alcohol intoxication should promote deontological responses—the opposite of what these authors found! Duke and Bègue (2015) proposed that impaired social cognition (e.g. reduced empathy) might provide an alternative route to consequentialist type judgment.

This claim is in line with research conducted by Patil and Silani (2014) on the relationship between reduced empathic traits and moral judgment. Patil and Silani (2014) found a positive relation between alexithymia, a trait associated with reduced empathic concern, and consequentialist judgments in footbridge type dilemmas. In a similar vein, Kahane and colleagues (e.g., Kahane, Everett, Earp, Farias, & Savulescu, 2015) found that sub-clinical psychopathy was associated with increased consequentialist type judgments in ethical transgressions in a business context. This association was further supported by Patil (2015). Importantly, Patil (2015) found that the association between psychopathy and consequentialist moral judgment was mediated by a reduced aversion to perform harmful actions. Taken together, these findings suggest that consequentialist type judgments might result from increased controlled processing but also from impaired intuitive processing. In the present essay, I will claim that foreign language use influences moral judgment through the latter route.

Combining the bilingual research that I described and moral judgment research, my co-authors and I predicted that processing moral scenarios in a foreign language as compared to the native language would influence moral judgment. Specifically, we expected that the use of a foreign language might impair intuitive processing by reducing the activation of social and moral norms. We also expected that the use of a foreign language would deplete cognitive resources, because processing information in a foreign language is more difficult and less automatic than processing one's native language (see Volk, Köhler, & Pudelnko, 2014). Specifically, in line with Duke and Bègue's (2015) findings with alcohol-intoxicated participants, we expected that the use of foreign language would increase consequentialist type judgments in the footbridge dilemma. We also expected that it would promote leniency towards harmless and harmful violations of moral rules.

In Chapter 2, we investigated whether the use of a foreign language, as compared to the native language, would influence the moral evaluation of the trolley and footbridge dilemmas. In Chapter 3, we examined whether the use of a foreign language influences moral judgments about moral transgressions that are harmless but offensive (e.g., eating one's dead dog). In Chapter 4, we examined the effect of foreign language once again on offensive but harmless actions but here also on morally good actions. To get a glimpse of the underpinning processes, we also asked participants to justify their moral evaluations, and checked whether the justifications were of the deontological or the consequentialist type.

Intuition and reasoning in risk judgment

How risky are nuclear power plants? To answer this question, many of us use our immediate intuitive reaction. Nuclear power plants often trigger negative associations, such as Chernobyl, Fukushima, or the image of death and devastation,

and so we judge them as risky. This is called risk as *feelings*. Other people may weigh the pros and cons of nuclear power plants and think about it in a more analytic way. This is called risk as *analysis*. The distinction between risk as feelings and risk as analysis, in essence, describes a dual process model of risk and benefit perception (see, e.g., Slovic, Finucane, Peters, & MacGregor, 2004). Risk as feelings is underpinned by intuitive processing and specifically emotions, whereas risk as analysis is underpinned by controlled processing.

Robert Zajonc (e.g., Zajonc, 1980) was among the first to recognize the importance of affect in judgment and decision-making. He noted that almost all perceptions involve feelings. For example, he noted that: "We do not just see "a house": We see a handsome home, an ugly house, or a pretentious house." These feelings in turn guide our judgments and decisions. Zajonc (e.g., Zajonc, 1980) demonstrated that repeated exposure to an object generates positive attitudes towards that object, which is known as "the mere exposure effect." For example, he presented participants with Chinese ideographs and varied the frequency of exposure. At a later point of the experiment, participants' attitudes towards these Chinese ideographs were measured. The more frequently an ideograph was presented, the more positive the attitudes towards it. This effect was found to be reliable across several types of stimuli such as audio or visual (see Bornstein, 1989).

In the 1990s, Antonio Damasio and colleagues (e.g., Damasio, 1994; Damasio, Grabowski, Frank, Galaburda, & Damasio, 2005) generated a more broad interest in the role of feelings in judgment and decision-making. Damasio studied patients with damage to the ventral and medial portions of the frontal lobes, regions that are associated with impaired skills to express emotion and experience feelings. They argued that reasoning and decision-making at large depends on sensory images. Those

images have come to be associated with good or bad feelings through lifelong learning, which in turn can predict outcomes of future situations (Damasio, 1994). This is called the *somatic marker hypothesis*. Damasio argued that somatic markers determine the decision-making process. Crucially, if the somatic markers are absent, such as in the case of the brain lesion patients that Damasio studied, the decision-making process is impaired. Damasio's work had a huge impact in the scientific community as it dispelled the long held view that emotions hinder reasoning.

Paul Slovic and colleagues (e.g., Slovic, MacGregor, Malmfors, & Purchase, 1999; Slovic, Finucane, Peters, & MacGregor, 2002, 2004) extended Damasio's somatic marker hypothesis and developed the *affect heuristic*. They argued that judgments and decisions are guided predominantly by mental representations that are associated with positive or negative affect. When making a judgment or decision, people consult the "affective pool" of a stimulus. In other words, they use the affective pool, or affective valence, as a proxy for making a judgment or decision. This is especially true in the case of complex decisions. Note that this is similar to the assumptions made by the Social Intuition Model (Haidt, 2001), which proposes that people use their immediate "gut feeling" to make a moral judgment.

Fischhoff and colleagues (e.g., Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978) provided the first empirical evidence for the affect heuristic in the context of risk perception. They demonstrated a negative relationship between risk and benefit judgments for hazards such as smoking, pesticides, or vaccination. Individuals judged, for example, smoking as high in risk and low in benefit, whereas vaccination as low in risk and high in benefit. This inverse relationship has been interpreted as evidence that individuals base their risk and benefit judgments on a hazard's affective pool. If the affective pool is negative it signals *danger*, so the

hazard is judged as high in risk and low in benefit. If it is positive then it signals *safety*, so the hazard is judged as low in risk and high in benefit. Such judgments are likely to be biased because in the real world the risk and benefit of hazards are typically associated (if at all) positively.

The affect heuristic was further supported in a study by Alhakami and Slovic (1994; see also Finucane, Alhakami, Slovic, & Johnson, 2000) who found that the affective evaluation of hazards, such as pesticides, was the major predictor of the risk and benefit correlation. These studies suggest that individuals base their risk and benefit judgments not only on analytic thinking, but also on their feelings on how they feel about the hazard. Finucane and colleagues call this "the dance of affect and reasoning" (Finucane, Peters, & Slovic, 2003), which in essence is a dual process proposal of risk and benefit judgment.

Combining this research with evidence from bilingual studies, in Chapter 5 my colleagues and I investigated whether presenting hazards in a foreign language versus the native language influences risk and benefit perception. Recall that bilingual studies suggest that a foreign language is less emotional than the native language, and that the emotional gap is particularly pronounced for negative emotions (e.g., Wu & Thierry, 2012; Sheikh & Titone, 2015). This suggests that the affective pool of a stimulus would be more positive in a foreign than in the native language. Based on the affect heuristic, we predicted that presenting hazards in a foreign language, as opposed to the native language, would increase their perceived benefit and decrease their perceived risk. Crucially, we also predicted that this effect would be mediated by affect. Chapter 5 provides empirical evidence for these predictions.

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Chapter 2

The foreign language effect on moral judgment: The role of emotions and norms

This chapter is based on the following original article:

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Abstract

We investigated whether and why the use of a foreign language influences moral judgment. We studied the trolley and footbridge dilemmas, which propose an action that involves killing one individual to save five. In line with prior work, the use of a foreign language increased the endorsement of such consequentialist actions for the footbridge dilemma, but not for the trolley dilemma. But contrary to recent theorizing, this effect was not driven by an attenuation of emotions. An attenuation of emotions was found in *both* dilemmas, and it did not mediate the foreign language effect on moral judgment. An examination of additional scenarios revealed that foreign language influenced moral judgment when the proposed action involved a social or moral norm violation. We propose that foreign language influences moral judgment by reducing access to normative knowledge.

Keywords: moral judgment; foreign language; bilingualism; emotion; social and moral norms.

The foreign language effect on moral judgment: The role of emotions and norms

The capacity to deliver moral judgments is a core aspect of social competence in humans. Philosophical and psychological investigations of moral cognition have often focused on complex dilemmas that create a tension between a deontological mode of responding, which stresses adherence to moral rules (e.g., "do not kill or harm innocent people"), and a consequentialist mode, which aims at maximizing the anticipated outcome (e.g., "do the greatest good for the greater number of individuals"). Research has shown that some moral scenarios tend to promote consequentialist judgments, while other scenarios, typically those that involve personal force and the instrumental use of a person [1, 2], tend to promote deontological judgments. For example, in the well-known trolley problems [3, 4], most people judge that it is acceptable to save five persons by hitting a switch that would produce one collateral victim (standard trolley problem), but deem it unacceptable to save five persons by pushing a person off a bridge (footbridge problem) [5, 6]. Why do people accept to save the lives of five by hitting a switch but not by pushing a person?[1]

Two main kinds of explanations have been proposed. One emphasizes the causal structure of actions and their contexts and posits the effect of tacit knowledge of abstract moral principles [8–10]. The other perspective emphasizes the selective activation of different processing routes to moral judgment [2, 11, 12]. In this perspective, responses result either from one route that is characterized by automatic emotional processes or an alternative route that consists of controlled cognitive processes. Emotional, "heart" thinking prompts a deontological response, whereas deliberate, "head" thinking privileges a consequentialist response. Deontological responses will dominate when moral dilemmas trigger a strong emotional response (e.g., footbridge problem), whereas consequentialist responses will surface when dilemmas are low in emotional salience (e.g., trolley problem).

Consistent with this view, priming the emotional system has been shown to privilege deontological responses, whereas priming the analytic system has been shown to preferentially support consequentialist choices [13,14]. Furthermore, cognitive load has been shown to selectively interfere with consequentialist responses, suggesting that such answers are products of controlled cognitive processes [15]. Additional evidence for this dual-process model of morality comes from neuropsychological studies, which show that brain-damaged patients with emotional deficits are more likely to give consequentialist responses to highly emotional dilemmas than controls [16, 17, 18].

Dual-process models of moral judgment may also guide research on language effects. In a recent study, Costa and colleagues reported that foreign language promotes consequentialist responses [19, 20]. These authors presented participants with the standard trolley and footbridge dilemmas either in a participants' native language or in a foreign language. They recruited participants from several cultures and examined an impressive number of native—foreign language combinations. Foreign language systematically increased the rate of consequentialist responses for the footbridge dilemma but had no influence on the responses to the standard trolley dilemma. Following dual-process models of morality, these authors argued that foreign language influences moral choice by triggering cognitive and emotional distance, that is, by prompting cold, "head" thinking. Its effects are felt in the footbridge dilemma as this presumably triggers the "hot", emotional system, but not in the trolley dilemma, which is presumably underpinned by the "cool", controlled system. The authors supported their claim that foreign language attenuates emotions by referring to experimental evidence from bilingual studies [21, 22].

Here we address whether and why presenting moral dilemmas in a foreign language rather than the native language influences moral judgment. By foreign language we mean a non-native language that has been learned in a classroom context, that is, outside the

environment where it is commonly used by native language speakers [23]. Our aim is twofold. First, we attempted to consolidate the findings of previous studies [19], which reported an increase of consequentialist responses in the footbridge dilemma, but not in the trolley dilemma. To this end, we presented these two dilemmas to native Italian speakers who learned either German or English as a foreign language (Study 1), and to native Chinese speakers who learned English as a foreign language (Study 2). Second, we aimed to investigate the claim that the foreign language effect on moral judgment is driven by reduced emotionality. For this purpose, alongside moral judgments we also gathered emotion ratings (Study 2). As a further test, we examined moral evaluations of additional high-emotion and low-emotion dilemmas (Study 3). If the effect is driven by reduced emotionality, then it should be more pronounced in the high-emotion dilemmas.

Study 1

In Study 1, we tested the foreign language effect on moral judgment using the footbridge and trolley dilemmas. We recruited students enrolled at foreign language courses at the University of Trento, because we wanted to ensure a good understanding of the materials. One group received the dilemmas in their native language, Italian, whereas two other groups in a foreign language, either English or German. We tested two foreign languages to assess the generality of the foreign language effect.

Methods

The study protocol was approved by the Ethics Committee of the University of Trento according to the principles expressed in the Declaration of Helsinki. We obtained participants' informed verbal consent by using a verbal consent protocol. The Ethics Committee of the University of Trento waived the requirement of written consent forms.

Participants. One hundred five students (88 female, 17 male; M_{age} = 22.08 years, age range: 19–46 years) volunteered to participate at the beginning of foreign language classes in

German or English at the University of Trento.[2] Thirty nine participants were randomly assigned to the native language condition (NL; Italian), 37 to the foreign language English condition (FL$_{English}$), and 29 to the foreign language German condition (FL$_{German}$). All participants had an *intermediate* level certificate (B = *independent user*) in the respective foreign language as specified by the *Common European Framework of Reference for Languages: Learning, Teaching, Assessment* (CEFR; [25]). On average, participants in the FL$_{English}$ condition had English education since the age of 10.72, CI [8.62, 13.31], and those in the FL$_{German}$ condition had German education since the age of 13.36, CI [11.74, 14.96]. Participants in the foreign language conditions were asked to self-assess their foreign language proficiency in terms of *conversational fluency*, *reading*, *writing*, and *understanding* on a 5-point scale (1 = *almost none*, 2 = *poor*, 3 = *fair*, 4 = *good*, 5 = *very good*; scale adapted from [26]). Across the four measures, the participants rated their foreign language skills as *fair* (FL$_{English}$: M = 3.33, CI [3.17, 3.50], FL$_{German}$: M = 3.79, CI [3.64, 3.95]).

Materials and Procedure. We presented participants with the trolley and the footbridge dilemmas, together with a non-moral filler dilemma (all items were adapted from [2]; see Appendix A for the full text). Each moral dilemma stated an action (i.e., hitting a switch, pushing a person off a bridge) that would harm an individual but as a consequence save five persons. Participants had to judge the appropriateness of the proposed action by selecting *Yes* (consequentialist response) or *No* (deontological response). The filler item concerned a choice between travelling by bus or train given certain time constraints, and was designed to induce a high rate of endorsements. We expected no language effect for this item. Its purpose was to assess whether participants in the foreign language condition understood the materials–misunderstandings should drive the endorsement rate towards 50%.

The presentation order of the moral dilemmas was counterbalanced. In each condition, participants received a questionnaire entirely written in one language: Italian, English, or

German. In all our studies, the original materials were in English, and were translated to other languages by bilinguals. Two independent judges controlled the translated versions for consistency with the English version. The language versions were also closely matched for word count.

Results

Preliminary analyses revealed no effect of presentation order. Hence, we dropped this factor from subsequent analyses. The main findings are illustrated in Figure 1. As anticipated, the use of a foreign language increased the rate of consequentialist responses in the footbridge dilemma but not in the trolley dilemma. While 12.8% of participants stated that it was appropriate to push the man off the footbridge when the dilemma was presented in the native language, this rate increased to 35.7% when it was presented in German, χ^2 (1, $N = 67$) = 4.92, $p = .027$, $\varphi = .27$, to 43.2% when the dilemma was presented in English, χ^2 (1, $N = 76$) = 8.79, $p = .003$, $\varphi = .34$, and to 40% if we collapse over foreign language condition, χ^2 (1, $N = 104$) = 8.61, $p = .003$, $\varphi = .29$. In the trolley dilemma, 53.8% of participants chose to hit the switch when the dilemma was presented in the native language. Similar rates were observed when the language was German (60.7%), χ^2 (1, $N = 67$) = 0.31, $p = .576$, $\varphi = .07$, and English (72%), χ^2 (1, $N = 76$) = 2.99, $p = .084$, $\varphi = .20$, or the two pooled together (67.7%), χ^2 (1, $N = 104$) = 1.99, $p = .158$, $\varphi = .14$.

In accord with previous research, within each language condition a higher proportion of participants endorsed the action of the trolley dilemma than of the footbridge dilemma (ps < .005, by binomial tests). Importantly, we observed no language differences for the non-moral filler item: $FL_{English}$: 92.0% vs. NL: 87.2%, χ^2 (1, $N = 76$) = .45, $p = .50$; FL_{German}: 93.1% vs. NL: 87.2%, χ^2 (1, $N = 68$) = 0.63, $p = .43$, $\varphi = 0.10$; FL_{Total}: 92.4% vs. NL: 87.2%, χ^2 (1, $N = 105$) = 0.78, $p = .38$, $\varphi = 0.09$. This suggests that the participants understood the materials.
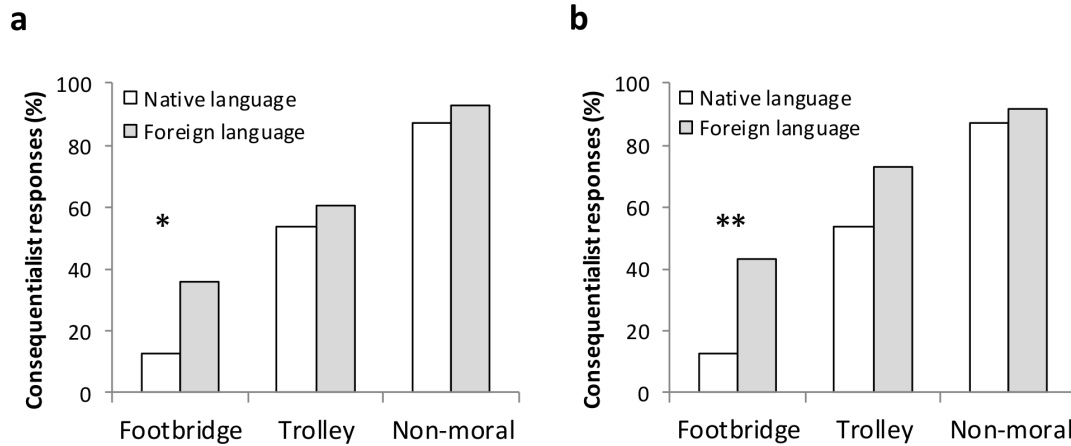
a

b

Figure 1. Percentage of participants who endorsed the consequentialist action in Study 1, by dilemma type and language condition. The native language was Italian. The foreign language was either German (a) or English (b). *p* < .05, **p* < .01.

Correlations between proficiency and moral judgment. We created a proficiency score by aggregating a participant's self-ratings in reading and understanding (each scale ranged from 1 = *almost none*, to 5 = *very good*). We only considered these scales because they are the most pertinent for the current task. The highest possible score is 10, which we also assigned to the participants in the native language condition. In the footbridge dilemma, we found that the lower the language proficiency, the higher the rate of action endorsements: $r(102) = -.22$, $p = .023$. No correlation between proficiency and action endorsements were observed in the trolley dilemma, $r(102) = -.09$, $p = .369$, or the non-moral dilemma, $r(102) = -.07$, $p = .505$.

Discussion

In line with prior research [19, 20], Study 1 showed that foreign language increases the rate of consequentialist responses in the footbridge dilemma but not in the trolley dilemma. This effect was robust across two foreign languages, English and German.

Importantly, the use of a foreign language had no influence on the evaluation of a non-moral dilemma, which suggests that the effect is "real" and not due to misunderstanding.

Study 2

In Study 2, we aimed to generalize the foreign language effect to a sample of native Chinese speakers who learned English as a foreign language. Although China accounts for roughly one fifth of the world's population, relatively few studies have examined how Chinese respond to moral dilemmas. Some cross cultural studies found cultural differences [27], whereas others did not [28]. Relevant to the present study, previous research has shown that the reduction of emotional force in a second language is also observed in late Chinese–English bilinguals [29].

Methods

Participants. We were granted access to courses in Tsinghua University, Wuhan University, and the Shanghai University of Sport, and tested 161 students (72 female, 88 male,1 unknown, M_{age} = 23.41 years, age range: 18–40).[3] Ninety-nine participants were randomly assigned to the foreign language condition (English), and 62 to the native language condition (Chinese). All participants reported to have a Band–4 College English Test certification (CET-4), which is the standard *English as a foreign language* test administered in China. In addition, participants had to self-assess their language proficiency in English in terms of conversational fluency, reading, writing, and understanding on a 5-point scale (1 = *almost none*, 2 = *poor*, 3 = *fair*, 4 = *good*, 5 = *very good*). Averaging across the four measures (Cronbach's α = .86), participants judged their English skills as *fair* (*M* = 3.15, CI [3.01, 3.29]). As a last task, participants assigned to the foreign language condition had to indicate whether they understood the scenarios on a 7-point scale (1 = *not at all*, 4 = *average*, 7 = *very well*; this question was presented in Chinese). We excluded nine participants who rated their

understanding as 3 or less (their exclusion does not influence the main pattern of results). The data we report are from the remaining 152 participants.

Materials and procedure. For the moral judgment task, we used similar materials and procedure as in Study 1. Participants were presented with the footbridge and trolley dilemmas, separated by a non-moral filler item. The presentation order of the moral dilemmas was counterbalanced. Following each dilemma, participants evaluated the moral permissibility of the proposed action on a binary scale (*Yes/No*), but here also on a more sensitive 7-point scale (1 = *forbidden*, 4 = *permissible*, 7 = *obligatory*; [5]). After the moral judgment questions, participants were asked to rate the extent to which each dilemma made them feel distressed (*Thinking about the scenario I just read, I felt… upset*, *worried*, and *sad*). For each emotion, participants had to respond using a 7-point scale (1 = *not at all*, 4 = *somewhat*, 7 = *very much*; adapted from [30]).

Results

Preliminary analyses revealed no effect of presentation order. Therefore, we dropped this factor from subsequent analyses.

Moral judgment (Yes/No). The main findings are illustrated in Figure 2. There was a significant foreign language effect for the footbridge dilemma (FL: 22.2% vs. NL: 9.7%), χ^2 (1, N = 152) = 4.07, p = .044, φ = .16, but not for the trolley dilemma (FL: 56.7% vs. NL: 56.5%), χ^2 (1, N = 152) < 1, p = .979, φ < .01. In line with Study 1 and previous research, within each language condition, a higher proportion of participants endorsed the action of the trolley versus the footbridge dilemma (*p*s < .001, by binomial tests). No language effect was present for the non-moral item (FL: 94.4% vs. NL: 93.5%), χ^2 (1, N = 152) < 1, p = .818, φ = .02.
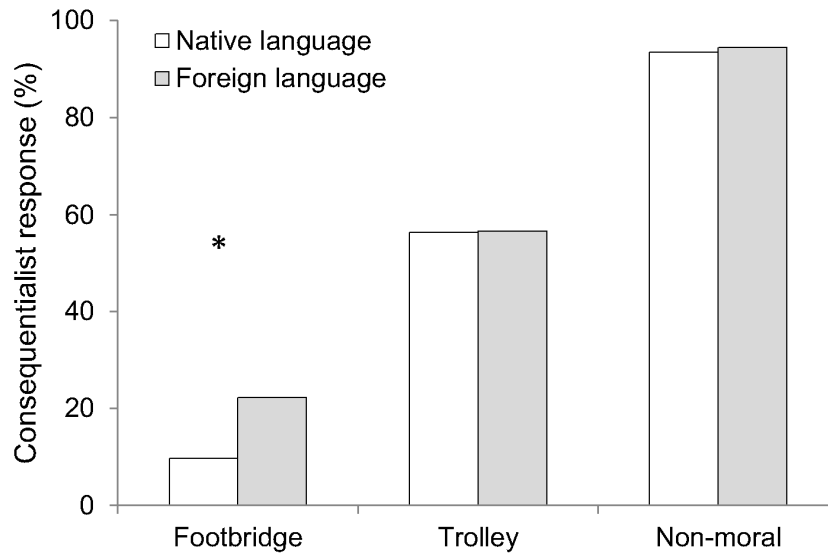
Figure 2. Percentage of participants who endorsed the consequentialist action in Study 2, by moral dilemma and language condition (native language = Chinese, foreign language = English). *p < .05.

Moral judgment (7-point scale). The main findings are illustrated in Figure 3. We submitted the permissibility ratings to a 2 (Language: foreign vs. native) × 3 (Dilemma type: footbridge vs. trolley vs. non-moral) mixed-factor analysis of variance (ANOVA) with repeated measures on dilemma type. This ANOVA revealed a main effect of language condition, $F(1, 149) = 16.80$, $p < .001$, $\eta_p^2 = .10$. As anticipated, mean consequentialist ratings were higher in the foreign language condition ($M_{FL} = 3.93$, CI [3.71, 4.14]) than in the native language condition ($M_{NL} = 3.23$, CI [2.97, 3.49]). Importantly, this main effect was qualified by a significant language × dilemma interaction, $F(1.92, 286.45) = 5.93$, $p = .003$, $\eta_p^2 = .04$.[4] The language effect was present only in the footbridge dilemma ($M_{FL} = 2.84$, CI [2.46, 3.22] vs. $M_{NL} = 1.44$, CI [1.21, 1.74]), $t(143) = 6.09$, $p < .001$, $d = 0.95$, CI [0.95, 1.86]. There was also a main effect of dilemma type, $F(1.92, 286.45) = 125.01$, $p < .001$, $\eta_p^2 = .46$.

In line with previous research, mean consequentialist ratings were lower in the footbridge dilemma ($M = 2.14$, CI [1.89, 2.39]) than in the trolley dilemma ($M = 3.61$, CI [3.31, 3.91]). (For the non-moral dilemma: $M = 4.99$, CI [4.75, 5.23]).
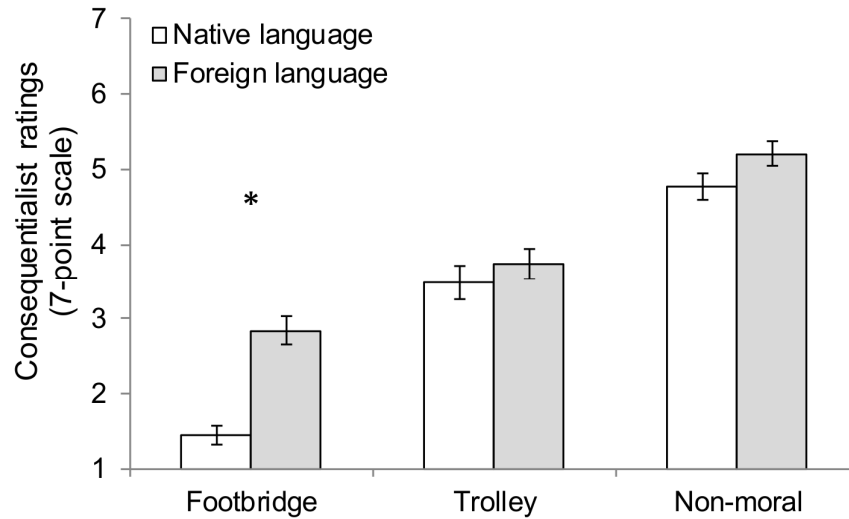

Figure 3. Mean consequentialist ratings in Study 2 (1 = *the action is forbidden*, 4 = *the action is permissible*, 7 = *the action is obligatory*) by moral dilemma and language condition (native language = Chinese, foreign language = English). Error bars indicate the standard error of the mean. *$p < .05$.

Correlations between proficiency and moral judgments. As in Study 1, we created a proficiency score by aggregating a participant's self-ratings in reading and understanding. We computed correlations between language proficiency and action endorsements (*Yes* = 1, *No* = 0) and between language proficiency and action permissibility ratings (1–7). For the footbridge dilemma, we found that the lower the language proficiency the higher the action endorsements, $r(150) = -.21$, $p = .009$, as well as the higher the permissibility ratings, $r(149) = -.48$, $p < .001$. For the trolley dilemma, there was no correlation between proficiency and action endorsements, $r(150) = -.02$, $p = .810$, or permissibility ratings, $r(149) = -.14$, $p =$

.099. For the non-moral dilemma, there was also no correlation between proficiency and action endorsements, $r(150) = .09$, $p = .288$, or permissibility ratings, $r(149) = -.11$, $p = .170$.

Distress ratings. The three distress scales (upset, worried, and sad) were highly correlated (Cronbach's α was .80 for the trolley dilemma, and .81 for the footbridge dilemma). Therefore, we collapsed them into a single distress index by calculating the mean over the three scales. With respect to the native language, the foreign language attenuated distress ratings for *both* moral dilemmas. A 2 (Language: foreign vs. native) × 2 (Dilemma type: trolley vs. footbridge) mixed-factor ANOVA, revealed a significant main effect of language, $F(1, 150) = 5.04$, $p = .026$, $\eta_p^2 = .03$, which was not qualified by an interaction, $F(1, 150) = 0.04$, $p = .846$, $\eta_p^2 < .01$. Overall, distress ratings were lower in the foreign language condition ($M_{FL} = 4.88$, 95% CI [4.60, 5.16]) than in the native language condition ($M_{NL} = 5.38$, CI [5.04, 5.72]). Distress ratings were higher in the trolley dilemma ($M = 5.30$, CI [5.06, 5.54]) than in the footbridge dilemma ($M = 4.96$, CI [4.70, 5.23]), as revealed by a significant main effect of dilemma type, $F(1, 150) = 8.19$, $p = .005$, $\eta_p^2 = .05$.[5]

Mediation analysis. We also conducted a mediation analysis to examine whether emotion mediates the effect of language on moral judgment in the footbridge dilemma. (We did not conduct a similar analysis for the trolley dilemma, as no language effect was detected for this item.) We used the SOBEL macro for SPSS [34] and the non-parametric bootstrapping procedure (5,000 bootstrapped re–samples). The predictor was language (foreign vs. native) and the mediator distress ratings. The total and indirect effects of language on moral judgment were respectively, 1.41 ($p < .001$) and 1.40 ($p < .001$). An examination of the total indirect effect of language on moral judgment through distress indicated no mediation, since its 95% BCa bootstrap CI contains zero, –0.085 to 0.109.

Discussion

Study 2 successfully extended the foreign language effect on moral judgment to late Chinese–English bilinguals. It also investigated whether this effect is underpinned by an attenuation of emotions, as it was proposed, but not tested, in previous studies. The use of a foreign language attenuated emotions in *both* moral dilemmas, and the emotion attenuation did not mediate the association between language and moral judgment.

Study 3

Following Greene's original proposal [2], one could conjecture that the foreign language effect on moral judgment is found in *personal* dilemmas, such as the footbridge scenario, but not in *impersonal* dilemmas, such as the trolley scenario. The two types of dilemmas vary on a number of dimensions, any one of which could be critical for observing the effect. For example, personal dilemmas involve harm caused using personal force, and the instrumental use of a person [1]. The main aim of Study 3 was to investigate whether the foreign language effect is linked to the personal-impersonal distinction. To this end, we examined an additional personal dilemma (high-emotion), the so-called 'crying baby scenario', and an additional impersonal dilemma (low-emotion), the 'lost wallet scenario' (for an assessment of these dilemmas in terms of emotionality, see [16]). The evidence that the crying baby dilemma is highly emotional, even more than the footbridge or the trolley dilemmas, is widely supported [31]. A further aim was to replicate the findings of Studies 1 and 2 as well as of previous studies showing a foreign language effect in the footbridge dilemma and no effect in the trolley dilemma. To test the robustness of the foreign language effect, we examined yet a different sample of bilinguals: native German speakers who learned English as a foreign language.

Method

Participants. Seventy-two native German speakers participated in this study (55 female, 15 male, 1 unknown; mean age = 26.63 years, age range = 18–70 years).[6] Thirty-eight

participated at the beginning of a lecture at the Free University of Berlin, while 34 in an online version of the study. The online-study participants were recruited from the University Osnabrück and Humboldt University Berlin via email lists. The link to the online survey was active for one week. Within the class and online parts of the study, participants were randomly assigned either to the foreign language condition ($n = 38$; English) or to the native language condition ($n = 34$; German). The level of qualification in English of the participants assigned to the foreign language condition ranged from beginner (A = *basic user*) to advanced (C = *proficient user*), with the majority holding an intermediate level qualification (B = *independent user*) (based on the CEFR; [25]). On average, the participants assigned to the foreign language condition began English education at age 9.02, CI [8.45, 9.60]. These participants were also asked to rate their proficiency in English in terms of conversational fluency, reading, writing, and understanding, on a 5-point scale (1 = *almost none*, 2 = *poor*, 3 = *fair*, 4 = *good*, 5 = *very good*). Averaging across the four measures (Cronbach's $\alpha = .89$), they rated their skills as *good* ($M = 4.05$, CI [3.80, 4.26]).

Materials and procedure. Participants were presented with the trolley, footbridge, and non-moral dilemma of Studies 1 and 2 along with an extra dilemma of each type (all dilemmas were adapted from [2]; for the full text see Appendix). The new dilemmas included a personal dilemma (crying baby), an impersonal dilemma (lost wallet), and a non-moral scenario. In the crying baby dilemma 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. In the lost wallet dilemma a person in need must decide whether to return a wallet full of cash that seems to belong to a wealthy individual. In the new non-moral dilemma one must decide whether to make two trips home by car rather than a single trip to carry some plants in order to avoid ruining the car's upholstery. About half of the participants in each language condition received the six dilemmas in a randomized order, while the other half received

them in the inverse order. Following each dilemma, participants had to rate the permissibility of the described action on a 7-point scale (1 = *forbidden*, 4 = *permissible*, 7 = *obligatory*; [5]).

Results

Preliminary analyses revealed no effect of method of administration (in classroom vs. online), or presentation order. Hence, we dropped these factors from subsequent analyses. In contrast to Studies 1 and 2, preliminary analyses revealed a significant gender effect. In line with prior work [13], male participants rated the consequentialist actions as more permissible (M = 3.00, CI [2.60, 3.40]) than female participants (M = 2.44, CI [2.23, 2.65]), $F(1, 68)$ = 6.24, p = .015, η_p^2 = .08. Given that gender differences were not a focus of the present study, in the analyses below we included gender as a covariate.

Moral judgments. The main findings for the moral items are illustrated in Figure 4. Notice that the pattern of the means for the four dilemmas is consistent with that reported in prior research [2]. We conducted a 2 (Language: foreign vs. native) × 4 (Moral dilemmas: 1–4) mixed-factor analysis of covariance (ANCOVA), with gender as a covariate. There was a main effect of language, $F(1, 68)$ = 6.29, p = .015, η_p^2 = .09. Mean consequentialist ratings were higher in the foreign language condition (M_{FL} = 2.74, CI [2.51, 2.97])[7] than in the native language condition (M_{NL} = 2.32, CI [2.08, 2.57]). This effect was not qualified by a language × dilemma interaction, $F(2.63, 178.89)$ = 0.29, p = .811, η_p^2 < .01.[8] There was no main effect of dilemma, $F(2.63, 178.89)$ = 2.58, p = .063, η_p^2 = .04.

A similar analyses performed for the non-moral scenarios showed no significant differences between the foreign language condition (M = 4.87, CI [4.60, 5.13]) and the native language condition (M = 4.50, CI [4.22, 4.78]), $F(1, 70)$ = 3.60, p = .062, f = .22. There was a main effect of scenario, $F(1, 70)$ = 79.85, p < .001, f = 1.07, but no Language × Scenario interaction, $F(1, 70)$ = 0.55, p = .461, f = .09.

In order to examine whether the foreign language effect is present in the footbridge dilemma and absent in the trolley dilemma, we conducted planned comparisons using multivariate analysis of covariance (MANCOVAs) with gender as a covariate. Confirming the pattern found in the previous studies, we detected a significant foreign language effect in the footbridge dilemma (M_{FL} = 2.04, CI [1.73, 2.36], M_{NL} = 1.53, CI [1.20, 1.87]), $F(1, 68)$ = 4.79, p = .032, η_p^2 = .07, but not in the trolley dilemma (M_{FL} = 3.87, CI [3.45, 4.29], M_{NL} = 3.67, CI [3.21, 4.12]), $F(1, 68)$ = 0.42, p = .517, η_p^2 = .01. We also performed similar analyses for the new dilemmas. A significant foreign language effect was observed in the lost wallet dilemma (M_{FL} = 2.42, CI [2.08, 2.76], M_{NL} = 1.90, CI [1.54, 2.27]), $F(1, 68)$ = 4.29, p = .042, η_p^2 = .06, but not in the crying-baby dilemma (M_{FL} = 2.63, CI [2.15, 3.11], M_{NL} = 2.18, CI [1.67, 2.70]), $F(1, 68)$ = 1.60, p = .211, η_p^2 = .02.
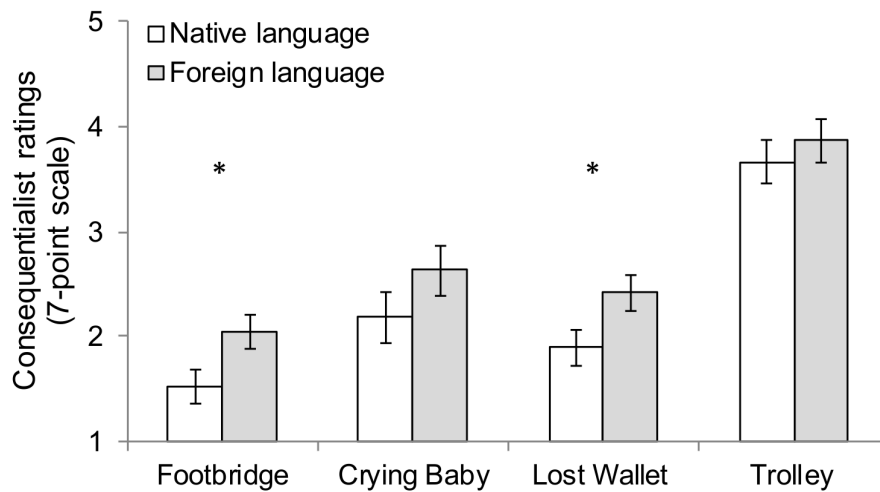

Figure 4. Mean consequentialist ratings (1 = *forbidden*, 4 = *permissible*, 7 = *obligatory*) by dilemma type and language condition in Study 3 (native language = German; foreign language = English). Error bars indicate the standard error of the mean. *p < .05.

Correlations between proficiency and moral judgment. Preliminary analyses showed that the participants in the foreign language condition reported high self-ratings of proficiency in reading and understanding ($M = 8.61$, CI [8.12, 9.08]). As a result, there was little variation in proficiency and thus weak associations between proficiency and moral judgment. The only dilemma for which we observed a significant (negative) correlation was the lost wallet: the lower the language proficiency, the higher the consequentialist ratings, $r(70) = -.30, p = .011$.

Discussion

In Study 3 we examined whether the foreign language effect is linked to the personal-impersonal distinction. The results do not support this hypothesis. We observed a foreign language effect, but this effect was not qualified by an interaction with dilemma type. Replicating the findings of Studies 1 and 2, detailed analyses showed that foreign language influenced moral judgments in the footbridge (personal) but not in the trolley (impersonal) dilemmas. Critically, the effect was also present in an impersonal dilemma (lost wallet). A surprising finding was that the foreign language effect was absent in the crying baby dilemma. This could be because, in contrast to the other dilemmas, in this dilemma the victim of the action would die regardless. In economic jargon, performing the action is the dominant option, because its payoff is better than the payoff of omitting the action. Participants in both language conditions might have thought about the dominance relation, which would explain both the high permissibility ratings (which are consistent with previous research; see Greene et al., 2001) and the absence of the foreign language effect.[9]

Meta-analyses

In Studies 1 and 3 there was a trend of a foreign language effect in the trolley dilemma. We examined this possibility by performing a random effects meta-analysis

summarizing the three studies. For completion, we also performed a similar meta-analysis for the footbridge dilemma.

  Trolley dilemma. Figure 5 illustrates the results of a random effects meta-analysis summarizing the three studies regarding the moral choices and judgments in the trolley dilemma (we used *Exploratory Software for Confidence Intervals*, see Cummings, 2012). The main result of each study (foreign language effect) is represented as a square marking the effect size (Cohen's *d*), and its 95% CI. The diamond represents the overall effect size of the meta-analysis, and its 95% CI. The overall effect size was 0.11, 95% CI [-0.07, 0.29], which is interpreted as *no effect* (Cohen, 1988). In conclusion, there was no foreign language effect for the trolley dilemma across the three studies.
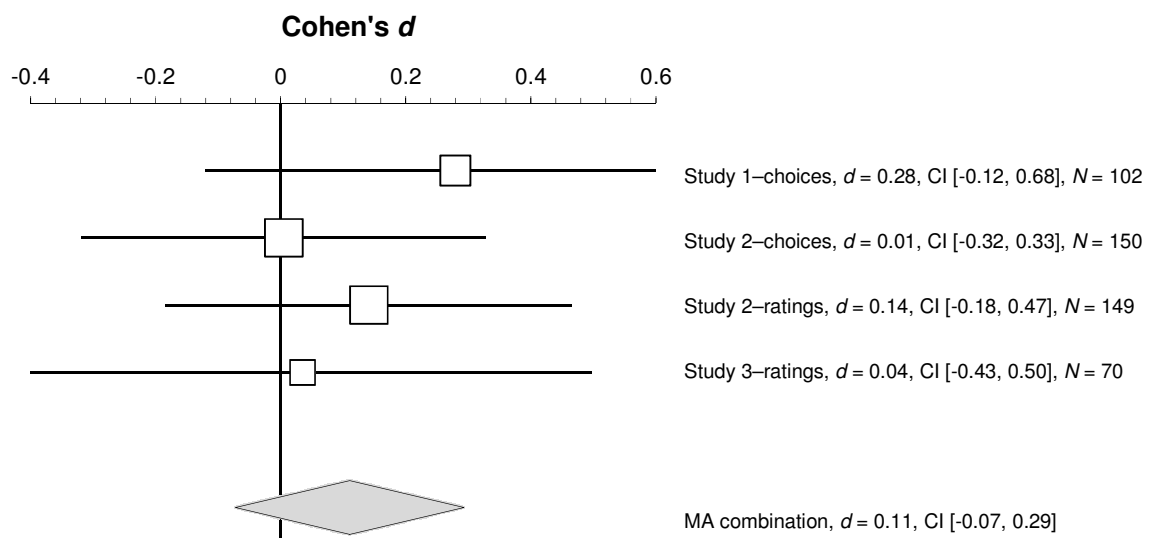

Cohen's *d*

Study 1–choices, *d* = 0.28, CI [-0.12, 0.68], *N* = 102

Study 2–choices, *d* = 0.01, CI [-0.32, 0.33], *N* = 150

Study 2–ratings, *d* = 0.14, CI [-0.18, 0.47], *N* = 149

Study 3–ratings, *d* = 0.04, CI [-0.43, 0.50], *N* = 70

MA combination, *d* = 0.11, CI [-0.07, 0.29]

Figure 5. Forest plot indicating the effect sizes (squares) and 95% CIs (lines) of the three studies for the foreign language effect on the trolley dilemma. The diamond illustrates the overall effect size and its 95% CI given by a random effects meta-analysis (MA) that combines the three studies.

Footbridge dilemma. Figure 6 illustrates the results of a random effects meta-analysis summarizing the three studies regarding the moral choices and judgments for the footbridge dilemma between the foreign language and the native language conditions. The overall effect size was 0.52, 95% CI [0.34, 0.71], which is interpreted as *intermediate effect* (Cohen, 1988). In conclusion, there was an intermediate foreign language effect for the footbridge dilemma across the three studies.
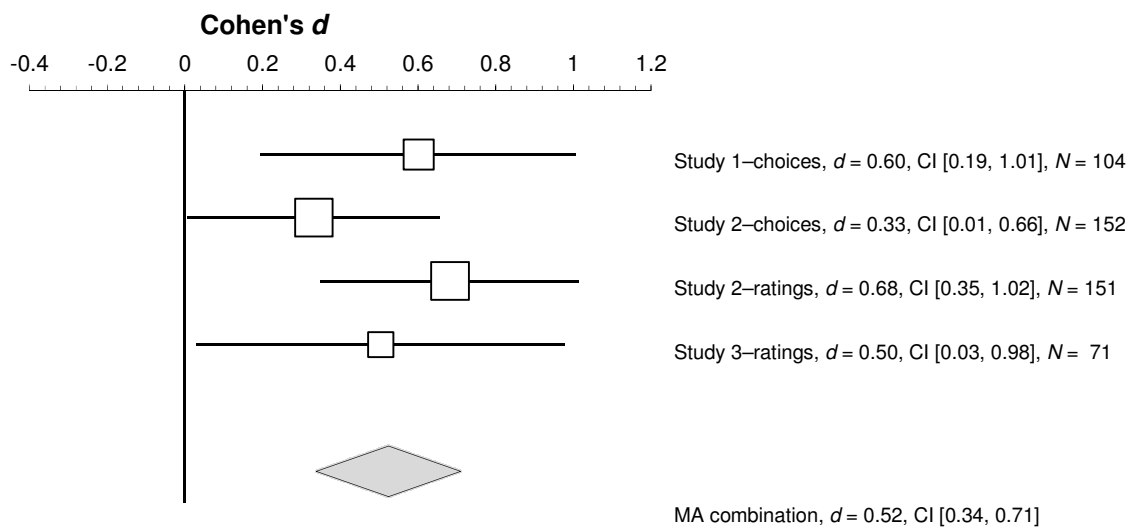

Cohen's *d*

Study 1–choices, $d = 0.60$, CI [0.19, 1.01], $N = 104$

Study 2–choices, $d = 0.33$, CI [0.01, 0.66], $N = 152$

Study 2–ratings, $d = 0.68$, CI [0.35, 1.02], $N = 151$

Study 3–ratings, $d = 0.50$, CI [0.03, 0.98], $N = 71$

MA combination, $d = 0.52$, CI [0.34, 0.71]

Figure 6. Forest plot indicating the effect sizes (squares) and 95% CIs (lines) of the three studies for the foreign language effect on the footbridge dilemma. The diamond illustrates the overall effect size and its 95% CI given by a random effects meta-analysis (MA) that combines the three studies.

General Discussion

The present studies provide strong evidence that the use of a foreign language influences the moral evaluation of complex moral dilemmas. In line with previous work [19, 20], foreign language increased the rate of consequentialist responses in the footbridge dilemma but not in the trolley dilemma (Studies 1–3, meta-analyses). However, in contrast to

previous theorizing, the results do not support the claim that this effect is driven by reduced emotionality. Foreign language attenuated emotions in response to *both* the footbridge and trolley dilemmas, and this emotion attenuation did not mediate the effect of foreign language on moral judgment (Study 2). Furthermore, the foreign language effect was not constrained to personal dilemmas; it was also present in an impersonal dilemma (lost wallet; Study 3). Interestingly, the foreign language effect was absent in the crying baby dilemma, which we suggested might be due to that this dilemma had a distinctive feature that was absent in all other moral dilemmas: the negative outcome of the action (the baby's death) would occur anyway, even if the action were not performed.[9]

If the emotional attenuation is not a viable explanation for the foreign language effect on moral judgment then what drives this effect? Why was the effect absent from the trolley dilemma but present in the footbridge and lost wallet dilemmas? Perhaps the critical difference is that the trolley dilemma does not involve a "taboo" or prohibited action. Social and moral rules prohibit us from pushing people or keeping lost wallets. However, we have no general rules prohibiting flipping switches (see Cushman's dual-system framework of morality [35]). We propose that foreign language may influence moral judgment by reducing the mental accessibility of social and moral rules. For this explanation to work, one has to assume that in the case of flipping the switch the categorization of the action at a more abstract level (killing the collateral innocent victim) is less automatic than the categorization of the other actions, such as keeping the wallet as a prototypical form of stealing.

Evidence that foreign language reduces the accessibility of social and moral rules comes from a study showing that foreign language promotes less condemnation of violations of everyday social and moral norms, such as cutting in line when in a hurry, or cheating in an exam [36]. Further evidence comes from a study in which participants were asked to translate swearwords either from a native to a foreign language or vice versa [37]. In the native to

foreign language translations, participants used "stronger" words to translate politically incorrect swearwords which were directed against social groups, compared to other types of swearwords. The authors of this study argued that in a foreign language the social and cultural norms are less salient, which makes it easier for people to use inappropriate swearwords (for similar views see [29, 38]).

One way through which foreign language might reduce the activation of social and moral norms, is by limiting access to relevant autobiographical memories. Research suggests that memories are language specific, and therefore are more accessible when the language used at retrieval matches the one present at encoding [39–41], that is, the native language. Research suggests that several moral and social rules are learned through social communication [42], and that a great chunk of such rules concern prohibitions of specific actions [43]. An analysis of a large corpus of data demonstrated that 99% of child-directed speech about rules of conduct, referred to the prohibition of particular actions, such as "Don't throw paper on the floor!", but there were also many cases of parents just saying "No!" [43]. A foreign language might evoke memories related to such prohibitions to a lesser extent than the native language. Consistent with this claim, Harris and colleagues [44, 21] showed that the use of a foreign language reduced electrodermal activity in response to childhood reprimands ("Don't do that!").

One limitation of the present research is that we employed a restricted number of moral dilemmas. Future research should examine a wider variety of moral scenarios [45, 46, 28]. A second limitation is that some of the scenarios we used (e.g., footbridge, trolley) are arguably "exotic" and distant from real life [47, 48]. Notice, however, that the foreign language effect extended to the more mundane lost wallet scenario. It would be worth investigating whether the effect generalizes to other realistic situations [see 36] and actual behavior. A third limitation is that we measured emotional reactions by means of rating

scales *after* the moral judgment was made. It could be that the higher emotion ratings in the trolley dilemma, as compared to the footbridge dilemma, are related to post-decisional processes. But note that previous studies have also measured emotions *before* the moral judgment was made and they failed to find support for the claim that the footbridge dilemma evokes more negative emotion than the trolley dilemma [31; see also 32]. A fourth limitation is that the increase in consequentialist responses found in the foreign language condition might be because participants assigned to that condition might have assumed that the situations involved foreign people in a foreign country. Research suggests that feelings of social connection to the characters involved in a dilemma influences moral evaluations [49, 50, 52]. But notice that the effect was present also in a study where participants were explicitly instructed to assume that the characters were co-nationals and that the situation took place in their country [36].

The present findings have important societal implications. International decisions such as those taken by the Economic European Community and the United Nations often involve communication in a foreign language (mostly in English). A number of such decisions involve a tradeoff between causing intentional harm to a number of individuals in the near future (e.g., by imposing strict economic rules), to increase the prosperity of a greater number of individuals in a relatively more distant future. If the use of foreign language reduces access to knowledge of social norms and deontological moral principles , then international decisions may be swayed (for better or worse) towards a consequentialist choice.

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Footnotes

[1] We follow Greene [7] in using deontological and consequentialist to mean "characteristically deontological" and "characteristically consequentialist" as a function of response content, not the underlying motivation.

[2] Sample size was determined by conducting an a–priori sample size calculation using *G*power* [24] for a 2×2 $\chi2$ test. The parameters were set as follows: effect size w = 0.4 (medium-high, estimated), alpha level = .05, power = .8, and degrees of freedom = 1. The calculation indicated a minimum sample size of 50. No interim analyses or stopping rules were applied.

[3] In Study 2, we used a binary (*Yes/No*) measure and a more sensitive 7-point scale (see Materials and Procedure). To determine the appropriate sample size, we conducted two a–priori sample size calculations using *G*power* [24]. The first was for a 2×2 χ^2 test, with the same settings as in Study 1. The calculations revealed a minimum sample size of 50. The second was for a 2×3 mixed ANOVA. The parameters were set as follows: effect size $f =$ 0.3 (medium-high), alpha level = .05, power = .8, correlation among measures at .4. The calculation indicated a minimum sample size of 56. No interim analysis or stopping rules were applied.

[4] Mauchly's test indicated that the assumption of sphericity had been violated, χ^2 (2, *N* = 151) = 6.09, *p* = .048, therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity (ε = .96).

[5] Although one might expect that the footbridge dilemma evokes stronger emotional reactions than the trolley dilemma [16], several studies have failed to find such evidence [31–33].

[6] The total sample size was determined in the same way as in Study 2. The a–priori sample size calculation indicated a minimum sample size of 56. Initially, we planned to

conduct the entire study at the end of a class session at the Department of Psychology of the Free University Berlin. Forty–eight participants volunteered to participate, but 10 participants were excluded from the analyses as they were not native German speakers. Therefore, we decided to increase the sample size by conducting an online version of the study. No interim analyses or stopping rules were applied.

[7] Two data points were detected as outliers as their values were greater than three standard deviations from the means. We winsorized these two values by aggregating the mean and two standard deviations.

[8] Mauchly's test indicated that the assumption of sphericity had been violated, χ^2 (5, N = 71) = 16.53, p = .005, therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity (ε = .88).

[9] We wish to thank an anonymous reviewer for pointing to us this explanation.

[10] Please note that we do not wish to claim that foreign language does not influence affect, Study 2 demonstrated that it does [23]. Furthermore, studies in the domain of risk and benefit perception have shown a foreign language effect that is mediated by affect [51]. Rather, the claim is that the foreign language effect on moral dilemmas might be more complex.

Appendix

Dilemmas used in Studies 1, 2, and 3 (English versions).

Personal dilemmas

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. Is it appropriate for you to push the stranger on to the tracks in order to save the five workmen? [This dilemma was used in all studies]

Crying Baby. Enemy soldiers have taken over your village. They have orders to kill all remaining civilians. You and some of your townspeople have sought refuge in the cellar of a large house. Outside you hear the voices of soldiers who have come to search the house for valuables. Your baby begins to cry loudly. You cover his mouth to block the sound. If you remove your hand from his mouth his crying will summon the attention of the soldiers who will kill you, your child, and the others hiding out in the cellar. To save yourself and the others you must smother your child to death. Is it appropriate for you to smother the child in order to save yourself and the other townspeople? [This dilemma was used in Study 3]

Impersonal dilemmas

Trolley. You are at the wheel of a runaway trolley quickly approaching a fork in the tracks. On the tracks extending to the left is a group of five railway workmen. On the tracks extending to the right is a single railway workman. If you do nothing the trolley will proceed to the left, causing the deaths of the five workmen. The only way to avoid the deaths of these workmen is to hit a switch on your dashboard that will cause the trolley to proceed to the right, causing the death of the single workman. Is it appropriate for you to hit the switch in order to save the lives of the five workmen? [This dilemma was used in all studies]

Lost Wallet. You are walking down the street when you come across a wallet lying on the ground. You open the wallet and find that it contains several hundred euros in cash as well the owner's driver's license. From the credit cards and other items in the wallet it's very clear that the wallet's owner is wealthy. You, on the other hand, have been hit by hard times recently and could really use some extra money. You consider sending the wallet back to the owner without the cash, keeping the cash for yourself. Is it appropriate for you to keep the money you found in the wallet in order to have more money for yourself? [This dilemma was used in Study 3]

Non-moral dilemmas

Train or Bus. You need to travel from Bologna [*Beijing*; *Berlin*] to Ancona [*Jinan*; *Leipzig*] in order to attend a meeting that starts at 2:00 PM. You can take either the train or the bus. The train will get you there just in time for your meeting no matter what. The bus is scheduled to arrive an hour before your meeting, but the bus is occasionally several hours late because of traffic. It would be nice to have an extra hour before the meeting, but you cannot afford to be late. Is it appropriate for you to take the train instead of the bus in order to ensure you are not being late for your meeting? [This dilemma was used in all studies]

Plant Transport. You are bringing home a number of plants from a store that is about 5 kilometers from your home. The trunk of your car, which you've lined with plastic to catch the mud from the plants, will hold most of the plants you've purchased. Is it appropriate for you to make two trips home in order to avoid ruining the upholstery of your car? [This dilemma was used in Study 3]

Chapter 3

How foreign language shapes moral judgment

This chapter is based on the following original article:

Please note: The following article may not exactly replicate the final version published in the journal. It is not the copy of record

Abstract

We investigated whether and how processing information in a foreign language as opposed to the native language affects moral judgments. Participants judged the moral wrongness of several private actions, such as consensual incest, that were depicted as harmless and presented in either the native or a foreign language. The use of a foreign language promoted less severe moral judgments and less confidence in them. Harmful and harmless social norm violations, such as saying a white lie to get a reduced fare, were also judged more leniently. The results do not support explanations based on facilitated deliberation, misunderstanding, or the adoption of a universalistic stance. We propose that the influence of foreign language is best explained by a reduced activation of social and moral norms when making moral judgments.

Keywords: moral judgment, foreign language, bilingualism, emotion, social and cultural norms

How foreign language shapes moral judgment

Imagine reading about the case of a brother and sister who have an incestuous relationship. What would your moral reaction be? Most people judge incest as wrong, even in circumstances where potential harm is minimized (Haidt, 2001). Now imagine reading the same story in a foreign language that you comprehend well. Would your moral reaction change? It shouldn't – the story is the same (principle of description invariance [Tversky & Kahneman, 1981] or extensionality [Arrow, 1982]).[1] But psychological research on moral violations suggests that it might: A higher proportion of participants judge that it is acceptable to shove a man into the path of a trolley to save five lives, when the scenario and questions are printed in a foreign language rather than in their native language (Cipolletti, McFarlane & Weissglass, 2015; Costa et al., 2014; Geipel, Hadjichristidis, & Surian, 2014).

Here we aimed to extend the foreign language effect to actions that are relatively harmless, but nevertheless typically condemned. We expected that foreign language would distance participants from intuition and gut-feelings, and through that promote less harsh moral judgments. We considered two competing hypotheses. Costa et al. (2014) proposed that a "muted" intuition could make the moral machinery switch from the default automatic, intuitive mode, to a controlled mode, thus focusing the attention to the harmless consequences (see also Cipolletti et al., 2015). We call this the *controlled-processing* hypothesis. Alternatively, the moral machinery might remain on the automatic, intuitive mode, but the muted intuition would nevertheless promote less harsh moral judgments. We call this the *automatic-processing* hypothesis. This could happen either through an attenuation of the typical aversive reaction (see the *affect heuristic*; Slovic, Finucane, Peters, & MacGregor, 2002; Kahneman & Frederick, 2002), or a reduction of the mental accessibility of moral and social rules (e.g., Bond & Lai, 1986; Dewaele, 2010). Moral and

social rules are learned and experienced through interactions involving the native language, and so a foreign language might evoke them to a lesser extent (see Marian & Neisser, 2000).

Prior research

Foreign language has been shown to attenuate emotional response to words and phrases (for reviews see Caldwell-Harris, 2014; Pavlenko, 2012). For example, Harris and colleagues found that childhood reprimands, such as "Don't do that!", evoked reduced skin conductance responses when they were read aloud in a foreign language (Harris, Ayçiçegi, & Gleason, 2003; Harris, Gleason, & Ayçiçeği, 2006). Moreover, a large questionnaire-based study has shown that late bilinguals rated taboo words and swearwords as less emotional in a foreign language than in a native language (Dewaele, 2004; Pavlenko, 2004). Studies also suggest that a foreign language facilitates people to discuss topics that are considered off-limits or taboo in their native language. For example, Bond and Lai (1986) found that Chinese-English bilinguals spoke longer about embarrassing topics, such as sexual attitudes, in a foreign language. In the same vein, Dewaele (2010) found that several UK-based multilinguals preferred using swearwords in a foreign language, stating that a foreign language allows them to escape from social and cultural restrictions. However, some studies have failed to detect an attenuation of emotions (e.g., Ayçiçegi-Dinn, & Caldwell-Harris, 2009; Eilola, Havelka, & Sharma, 2007; Sutton, Altarriba, Gianico, & Basnight-Brown, 2007). To reconcile these findings, Harris and colleagues proposed that the relative emotionality of a foreign versus a native language depends on a complex interplay between age of acquisition, level of proficiency, and the emotional context in which the foreign language is learned and used (Caldwell-Harris, 2014; Harris et al., 2006).

Foreign language has also been shown to reduce decision biases that are believed to have an emotional basis (Keysar, Hayakawa, & An, 2012). Moreover, recent studies demonstrated that it also influences moral judgment (Costa et al., 2014; Geipel et al. 2014).

This research was confined to trolley dilemmas (Foot 1978; Thompson, 1985) that create tension between a characteristically utilitarian perspective, which aims at maximizing net benefit, and a characteristically deontological perspective, which forbids actions that harm innocent others. You are informed that a runaway trolley will kill five people unless an action is performed, either pulling a lever (standard trolley dilemma) that would make the trolley switch to alternative tracks where one workman is standing, or by pushing a person off a bridge (footbridge dilemma). Is it morally acceptable to perform such actions? Adults and children by the age of four typically respond that it is acceptable to pull the lever, but not to push the person (Cushman, Young, & Hauser, 2006; Pellizzoni, Siegal, & Surian, 2010).

The dual-process theory of moral judgment (e.g., Greene, Morelli, Lowenberg, Nystrom, & Cohen, 2008; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001) explains these findings by suggesting that responses result from a competition between an automatic, emotional system that prompts a deontological response, and a slow, controlled system that favors a utilitarian response.[2] When the proposed action is emotionally salient (pushing a person off a bridge), the emotional system predominates; when it is not (pulling a lever), the controlled system overrides the emotional system and produces a characteristically utilitarian response (see also Koenigs et al., 2007).

When these trolley dilemmas were presented in a foreign language, utilitarian responses increased but just for the footbridge dilemma (Costa et al., 2014; Geipel et al., 2014). Furthermore, as proficiency in the foreign language increased, language differences decreased. These results were robust across a variety of foreign—native language combinations and cultures (for a replication, see Cipolletti et al., 2015). The proposed explanation is that foreign language triggers emotional distance, which privileges controlled processing (controlled-processing hypothesis). Its effects are observed in the footbridge

dilemma, as this is typically processed by the emotional system, but not in the trolley dilemma, which is commonly processed by the controlled system (Greene et al., 2001).

Notice that these findings are also compatible with the automatic-processing hypothesis. The footbridge dilemma involves a prohibited action (pushing a person; see Cushman, 2013), whereas the trolley dilemma does not. It could be that foreign language promoted utilitarian responses for the footbridge dilemma, because it allowed people to see past the taboo action (either by reducing the aversive response linked to the prohibition, and/or by deactivating social and moral norms). This interpretation is consistent with recent research that shows that characteristically utilitarian responses do not necessarily imply controlled processes, but may also arise from impaired social cognition, such as reduced empathy (see Duke & Bègue, 2015; Kahane, Everett, Earp, Farias, & Savulescu, 2015).

Previous studies examining the role of foreign language on moral judgment have four limitations. First, they have examined only the trolley dilemmas, which involve severe personal harm and concern contrived cases distant from the participants' experience (Hare, 1981; Sunstein, 2005). Second, these dilemmas involve a numerical tradeoff (killing *one* in order to save *five*). As processing information in a foreign language is difficult, people might have treated the dilemmas as simple math problems (Bloom, 2011). Third, these studies offer no empirical support for the central claim that language has a cooling effect on emotions, or that this cooling effect prompts controlled (utilitarian) reasoning. Fourth, the results are open to an in-group out-group interpretation (Caldwell-Harris, 2014). Participants reading the materials in a foreign language might have inferred that the scenarios concerned foreign people (out-group), whereas those reading them in the native language might have inferred that they concerned co-nationals (in-group). Research suggests that feeling socially connected to the characters portrayed in a scenario influences moral judgment (e.g., Bloom, 2011; Greene, 2013; Lucas & Livingston, 2014). Thus, the observed foreign language effect might

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reflect added assumptions, rather than the use of foreign language per se. In the present study we address all these issues.

Present research

Our first aim was to broaden the scope of the foreign language effect on moral judgment. We examined different types of violations that, according to the categorization proposed by Shweder, Much, Mahapatra and Park (1997; see also Guerra & Giner-Sorolla, 2010), concern the ethics of Community (e.g., violations of loyalty), Autonomy (e.g., violations of fairness) and Divinity (e.g., violations of purity) (CAD for short; for an extension of this model see Graham, Haidt, & Nosek, 2009; Haidt & Joseph, 2008). We selected violations that did not involve physical harm, such as siblings having consensual and safe sex (see e.g., Björklund, Haidt, & Murphy, 2000; Eyal, Liberman, & Trope, 2008; adapted from Haidt, 2001). People typically judge such behaviors as ethically wrong, but struggle to supply moral justifications (*moral dumbfounding*; Haidt, Koller, & Dias, 1993). To test the generalizability of this effect, we also asked participants to evaluate relatively harmful and harmless social norm violations in community and autonomy ethics. We predicted that foreign language would promote less harsh moral judgments.

Our second aim was to test whether the effect of foreign language on moral judgment is underpinned by an attenuation of emotions, as previous studies have suggested. A third aim was to differentiate between the *automatic-* and *controlled-processing* hypotheses. To this purpose, we used two tasks. We asked participants to state their confidence in their moral evaluations, and to answer a tricky question (see Study 3), which tests the ability to override an intuitive wrong answer. Finally, we assessed a number of deflationary explanations of the foreign language effect, such as that it is simply due to misunderstanding, or in-group out-group considerations.

Study 1

In Study 1, we examined whether reading moral transgressions in a foreign versus a native language influences moral wrongness judgments (see Table 1 for descriptions of the scenarios). We tested native German speakers and native Italian speakers. For both, the foreign language was English. We predicted that the use of a foreign language would promote less harsh moral judgments.

Methods

Participants.

Study 1a. Forty-eight students (34 female, 14 male; mean age = 27.27 years, range: 18–70 years) from the Free University of Berlin participated at the beginning of a class.[3] Twenty-seven students were randomly assigned to the foreign language condition and received a questionnaire in English and 21 to the native language condition and received its German equivalent. Ten participants were excluded from the analyses, as they were not native German speakers. For all studies, details of the participants assigned to the foreign language conditions are presented in Appendix A.

Study 1b. Sixty-four students (56 female, 6 male, 2 unknown; mean age = 20.56 years, range: 19–24 years) from the University of Trento participated at the beginning of an English class for credits.[4] Thirty-six were randomly assigned to the foreign language condition (English), and 28 to the native language condition (Italian). Four participants were excluded from the analyses, as they were not native Italian speakers.

Materials and Procedure. We used four scenarios (adapted from Haidt et al., 1983; Eyal et al., 2008) each describing one or more persons committing a moral violation (see Table 1, dog, incest, exam and flag items). Participants were asked to judge the wrongness of each action on a scale ranging from 0 (*perfectly ok*) to 9 (*extremely wrong*). Two presentation orders were created and counterbalanced across participants. In all our studies the original

Table 1
Scenarios Used in Studies 1, 2 and 3 (English Versions).

Scenario	Description
Moral	
Dog[1, 2, 3]	Frank's dog was killed by a car in front of his house. Frank had heard that in China people occasionally eat dog meat, and he was curious what it tasted like. So he cut up the body and cooked it and ate it for dinner. [Study 1a: Franz; Study 1b: Frank; Study 2: Franco; Study 3: Lorenzo]
Incest[1, 2, 3]	A brother and sister are alone in the house and decide to make love just once. The sister is already taking birth control pills and the brother uses a condom. They both enjoy the act but decide not to do it again. They promise each other to keep it a secret.
Exam[1, 2, 3]	A student who doesn't know the answers to some of the questions in an exam copies them from a student sitting in front of him. He doesn't get caught and he and the other student both get good grades. [Study 3: Silvia]
Flag[1, 2]	A woman is cleaning out her closet, and she finds a national flag. She decides to cut it up into small pieces and uses the pieces to clean the toilet.
Bonus[3]	Two employees have worked equally toward a project. The project went well so they are entitled to a collective bonus of 1000 Euros. The manager, Giulia, is a friend of one of the employees and wants to allocate the entire bonus to him. Giulia sends an email to the finance office, but the email never arrives due to a server failure. As a result, each employee gets 500 Euros.
Non-moral	
Train[3]	Francesca lives in Florence and would like to visit one of her friends in Imola. If she takes the Eurostar she has to pay 21 Euro but the service is very comfortable. If she instead takes the regional train she pays 6 Euro but the wagons are a bit cold and dirty. Francesca takes the regional train.
Brand[3]	Marco has a strong headache. He goes to the pharmacy with the intention of buying a headache medicine from Bayer. The pharmacy is out of the medicine from Bayer Marco was looking for, but has a generic product which is, in his words, "exactly the same" as the product he intended to buy. Marco buys the generic brand medicine.

Note. Superscripts indicate the studies in which the scenarios were used.

materials were in English, they were translated by individuals who are highly proficient in the

foreign and native languages used, and checked by bilingual speakers for comparability. The

two versions of each scenario were also closely matched for word counts.

Results

Study 1a. The results are illustrated in the left panel of Figure 1. We submitted the mean wrongness ratings to a 2 (Language: foreign vs. native) × 4 (Scenario: 1-4) mixed factor analysis of variance (ANOVA), with repeated measures on scenario. As predicted, there was a significant main effect of language, $F(1, 34) = 6.44$, $p = .016$, $f = .43$. The scenarios were judged less harshly in the foreign language ($M = 3.57$, CI [2.83, 4.31])[5] than in the native language ($M = 4.91$, CI [4.13, 5.70]). There was also a significant main effect of scenario, $F(3, 102) = 24.52$, $p < .001$, $f = .85$. Mean wrongness ratings for the dog scenario ($M = 6.14$, CI [5.21, 7.07]) and the incest scenario ($M = 5.53$, CI [4.57, 6.49]) were significantly higher than those for the exam scenario ($M = 3.42$, CI [2.40, 4.44]) and the flag scenario ($M = 1.72$, CI [0.95, 2.50]). There was no language × scenario interaction, $F(3, 102) = 1.34$, $p = .265$, $f = .20$.

Study 1b. The results are illustrated in the right panel of Figure 1. We submitted the mean wrongness ratings to a 2 (Language: foreign vs. native) × 4 (Scenario: 1-4) mixed-factor ANOVA, with repeated measures on scenario. As in Study 1a, we found a significant main effect of language, $F(1, 58) = 4.93$, $p = .030$, $f = .29$. The scenarios were judged less harshly when presented in the foreign language ($M = 5.40$, CI [4.73, 6.07]) than in the native language ($M = 6.55$, CI [5.76, 7.34]). There was a significant main effect of scenario, $F(3, 174) = 15.57$, $p < .001$, $f = .52$. The mean wrongness ratings of the incest scenario ($M = 6.93$, CI [6.23, 7.64]), the dog scenario ($M = 6.20$, CI [5.38, 7.02]), and the exam scenario ($M = 6.40$, CI [5.77, 7.03]) were all significantly higher than the mean wrongness rating of the flag scenario ($M = 4.36$, CI [3.67, 5.05]). No other differences were observed. There was no language × scenario interaction, $F(3, 174) = 0.54$, $p = .656$, $f = .10$.
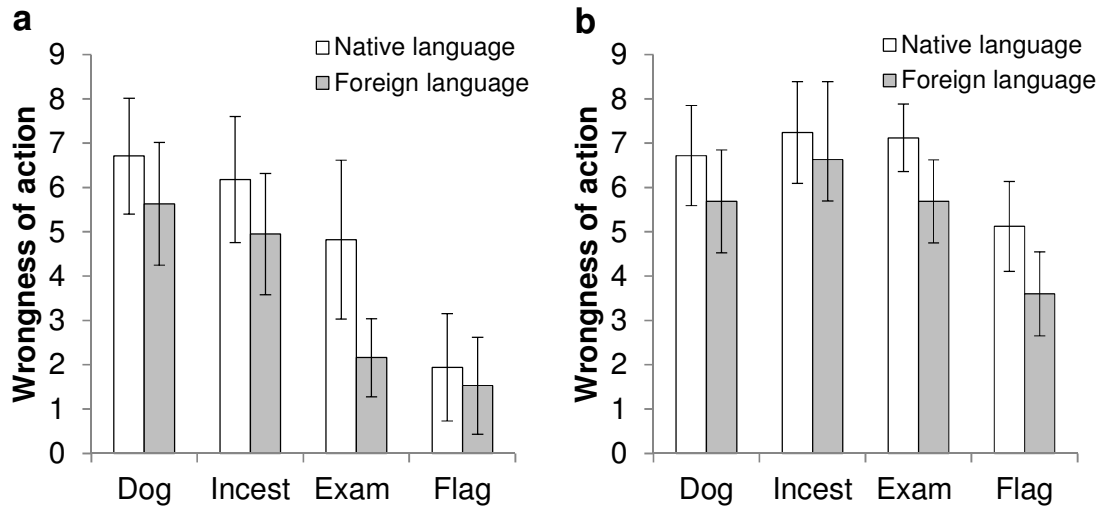
Figure 1. Mean wrongness of action ratings (0 = *perfectly ok*; 9 = *extremely wrong*) by scenario and language condition. In Study 1a (a) the native language was German and the foreign language was English. In Study 1b (b) the native language was Italian and the foreign language was English. Error bars represent 95% CIs.

Study 2

In Study 2, we presented a new sample of late Italian-English bilinguals with the same four scenarios. In addition to moral judgments, we also asked participants to rate their emotional reactions. Here, our main aim was to examine whether foreign language influences moral judgments by attenuating emotions.

Methods

Participants. Seventy-eight English majors (61 female, 15 male, 2 unknown; mean age = 23.11 years, age range: 20–38 years) from the University of Verona participated at the beginning of an English lesson; 42 were randomly assigned to the foreign language condition (English), and 36 to the native language condition (Italian).[6]

Materials and Procedure. Following each scenario, participants judged the wrongness of the action that was depicted in it. They were also asked to rate how *upset*, *worried*, *disgusted*, *sad*, and *angry* they felt while reading the scenario using a 5-point scale (1 = *very slightly or not at all*, 2 = *a little*, 3 = *moderately*, 4 = *quite a bit*, 5 = *extremely*; from Watson, Clark, & Tellegen, 1988). The presentation order of the moral judgment and emotion rating tasks was counterbalanced. Preliminary analyses revealed no order effects and so we dropped this factor from the analyses.

Results and discussion

Emotion ratings. The five emotion scales were highly associated (Cronbach's alpha = .85 in the native language condition, Cronbach's alpha = .85 in the foreign language condition). Thus, we reduced the five scales into an emotion index score by taking their average (see Figure 2). The resulting scores were submitted to a 2 (Language: foreign vs. native) × 4 (Scenario: 1-4) mixed-factor ANOVA, with repeated measures on scenario. Although there was no main effect of language, $F(1, 76) = 1.24$, $p = .268$, $f = .13$, there was a significant language × scenario interaction, $F(3, 228) = 5.56$, $p = .001$, $f = .26$. Simple one-way ANOVAs revealed that foreign language attenuated emotions in the dog scenario ($M_{FL} = 3.33$, $M_{NL} = 3.88$), $F(1, 76) = 6.30$, $p = .014$, $f = .29$, and in the incest scenario ($M_{FL} = 2.84$, $M_{NL} = 3.48$), $F(1, 76) = 7.22$, $p = .009$, $f = .31$, but not in the exam scenario ($M_{FL} = 2.26$, $M_{NL} = 2.05$), $F(1, 76) < 1$, $p = .341$, $f = .11$, and flag scenario ($M_{FL} = 2.45$, $M_{NL} = 2.12$), $F(1, 76) = 1.62$, $p = .207$, $f = .15$. There was also a main effect of scenario, $F(3, 228) = 42.89$, $p < .001$, $f = .75$. Post hoc comparisons indicated that the mean emotion ratings of the dog scenario ($M = 3.61$, CI [3.39, 3.83]), the incest scenario ($M = 3.16$, CI [2.92, 3.40]) and the flag scenario ($M = 2.28$, CI [2.03, 2.54]) were significantly higher than the mean emotion rating of the exam scenario ($M = 2.16$, CI [1.93, 2.38]).
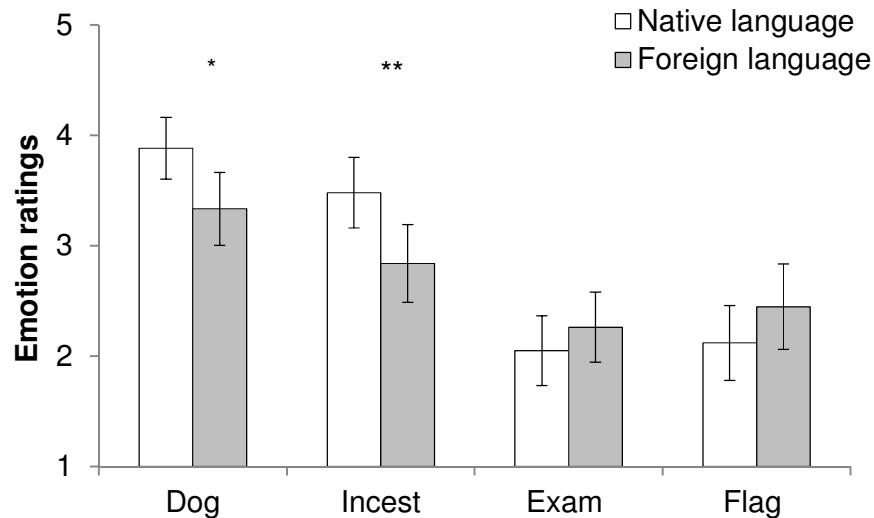
Figure 2. Mean emotion ratings by scenario and language condition (Study 2). Native language: Italian; Foreign language: English. Error bars indicate 95% CIs. *$p < .05$,**$p < .01$.

Moral judgments. Previous studies have suggested that foreign language influences moral judgment by attenuating emotions. We thus grouped the items into those that showed an attenuation of emotions (dog, incest) and those that did not (exam, flag). We predicted that foreign language would promote less harsh moral judgments but for only the dog and incest items. Furthermore, these items were relatively more emotional than the exam and flag items, and previous research suggests that the effect of foreign language is confined to high emotion items, such as the footbridge dilemma (Costa et al., 2014; Geipel et al., 2014).

The findings are illustrated in Figure 3 and are consistent with this prediction. We analyzed the mean wrongness ratings with simple one-way ANOVAs. For the dog and incest items foreign language promoted less harsh moral judgments ($M = 7.75$, CI [7.22, 8.27]) than the native language ($M = 8.47$, CI [8.15, 8.79]), $F(1, 76) = 5.17$, $p = .026$, $f = .23$. For the exam and flag items, foreign language ($M = 5.59$, CI [4.88, 6.15]) and native language ($M = 5.68$, CI [5.08, 6.33]) induced similar moral ratings, $F(1, 76) = 0.04$, $p = .851$, $f < .01$.
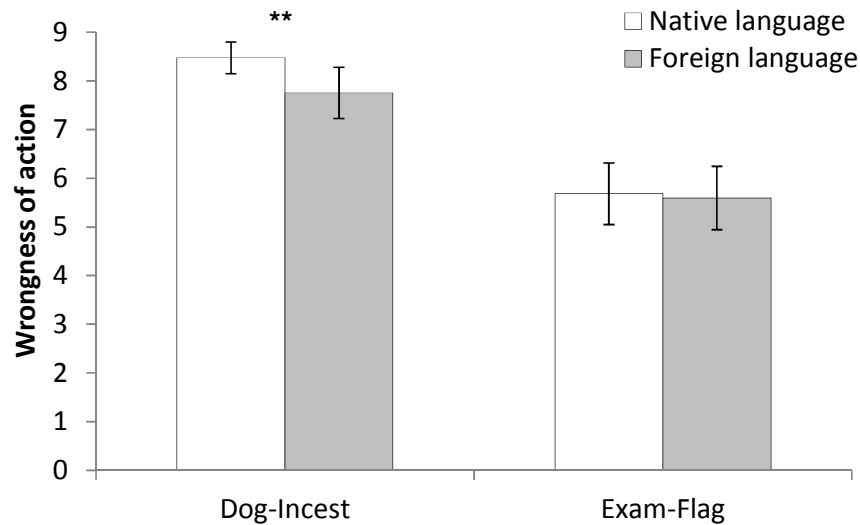
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Figure 3. Moral wrongness ratings for the groups of items by language condition (Study 2). Higher scores indicate higher moral wrongness ratings. Native language: Italian; Foreign language: English. Error bars represent 95% CIs. **$p < .01$.

Correlations between emotion and moral judgment ratings. If foreign language promotes dispassionate controlled thinking, then moral judgments should rely less on emotions and gut feelings. Therefore the correlation between moral judgments and emotion ratings should be weaker in the foreign language condition than in the native language condition (see Shiv & Fedorikhin, 1999). Contrary to this prediction, both correlations were statistically significant (native language: $r[36] = .70$, $p < .001$; foreign language: $r[41] = .56$, $p < .001$), and did not differ from one another ($z = 1.01$, $p = .311$).

Mediation analyses. We performed a mediation analysis using the SOBEL macro by Preacher and Hayes (2004). We used only the dog and incest items, for which we detected an attenuation of emotions. We used the bootstrapping procedure (5000 bootstrapped re-samples). Figure 4 illustrates the results. There was a significant direct effect of language on moral judgment ($B = -.72$, $SE = .32$, $p = .026$). The indirect effect controlling for emotions

lies between -1.020 and -0.085 with 99% confidence ($B = -.46$, $SE = .19$). Because this interval does not include 0, we can conclude that emotion mediates the association between language and moral judgment.
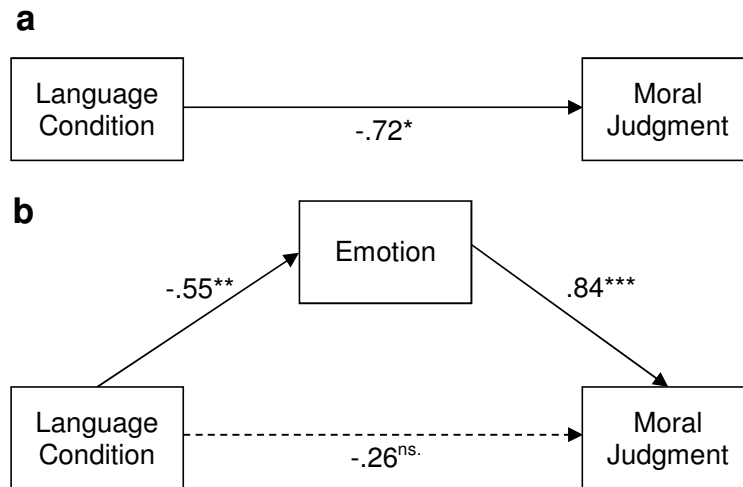
a

Language Condition	→ -.72* →	Moral Judgment

b

Emotion

-.55**   .84***

Language Condition	----- -.26ns. ----->	Moral Judgment

Figure 4. Illustration of the direct effect (a) and indirect effect (b) of language on moral judgment (Study 2). Numbers refer to unstandardized beta weights. $*p < .05$ $**p < .01$ $***p < .005$.

As a check of the proposed mediation hypothesis, we also conducted an analysis based on a reverse mediation model. We assessed whether the association between language and emotions is mediated by moral judgments. There was a direct effect of language on emotions ($B = -.55$, $SE = .18$, $p = .003$). The indirect effect of language on emotions controlled for moral judgment lies between -0.460 and 0.009 with 99% confidence ($B = -19$, $SE = .09$). Since this interval includes 0, we can conclude that there is no reverse mediation. Taken together, the analyses suggest that, for the dog and incest items, emotions mediated the effect of language on moral judgment.

In sum, in Study 2 we found that the use of a foreign language promotes less harsh moral judgments but only for the dog and incest items. For these items, foreign language influenced moral judgment through an attenuation of emotions. Moreover, in both language conditions moral judgments and emotion ratings were significantly correlated and to a similar extent, which is consistent with the automatic-processing hypothesis.

Study 3

In Study 3 we further examined whether foreign language influences moral judgment through an attenuation of emotions. Study 2 found support for this hypothesis but only in two out of four items. Interestingly, these items concerned violations of purity, whereas the other items concerned a violation of fairness (exam) and loyalty (flag). Could it be that the effect of foreign language on moral judgment is mostly confined to purity violations? Studies 1a and 1b, as well as previous studies on Trolley dilemmas (Costa et al., 2014; Geipel et al., 2014), suggest that this is not the case, but Study 2 leaves open this possibility. In Study 3 we addressed this question by testing two violations of purity (dog, incest) and two violations of fairness (exam, bonus; see Table 1). As a further test of the generalizability of the foreign language effect, we also asked participants to rate the moral wrongness of 15 items containing relatively harmful (e.g., *Sell someone a defective car*) and harmless (e.g., *Fail to vote in minor elections*) social norm violations in community and autonomy ethics (see Appendix B).

A second aim of Study 3 was to provide evidence to distinguish between the two competing hypotheses. To this end, we used two new tasks: the Moses illusion task and the confidence-rating task. In the Moses illusion task (Song & Schwarz, 2008; see Appendix B for full instructions) participants are asked: "How many animals of each kind did Moses take on to the ark?" The correct answer is "can't say" (since the biblical character was Noah), but most people are unable to override the automatic response "two" (Alter, 2013). If foreign

language promotes deliberation, then it should improve performance. The automatic-processing hypothesis predicts no such improvement. If anything, the increased burden on cognitive resources might deteriorate performance.

In the confidence-rating task, participants rated how sure they were in their moral evaluations. The automatic-processing hypothesis predicts that when using a foreign language people would be less confident in their judgments because they might lack the "it feels wrong!" signal that accompanies a strong aversive reaction,[7] which could be grounded on emotions and/or sociocultural norms. In contrast, if the use of a foreign language promotes deliberative thinking, the controlled-processing hypothesis predicts that people would be more confident, as their judgment will be a product of careful analysis (for further evidence that deliberative thinking leads to higher confidence, see Mata, Ferreira, & Sherman, 2013).

In Study 3 we also controlled for the possibility that the foreign language effect is due to misunderstanding (we asked participants to translate the materials). Furthermore we assessed whether it is constrained to the use of English, the modern lingua franca, as a foreign language (here we used German). Participants were told explicitly that the scenarios took place in their native country and involved co-nationals, in order to rule out possible in-group out-group factors. To assess whether foreign language promotes a universalistic stance, we asked participants to rate how close they feel to *People in my community*, *Italians*, and *People around the world*.[8]

Methods

Participants. Seventy-four German major students (67 females, 7 males; mean age = 21.03 years, age range: 18–30 years) from the University of Trento participated at the beginning of a German lesson.[9] Participants were randomly assigned to either the foreign language condition (German; $n = 37$) or the native language condition (Italian; $n = 37$). Analyses of the translations revealed that two participants assigned in the foreign language

condition mistranslated one item each. The scores for these two items were excluded from the analyses.

Materials and Procedure. We used two purity violations (dog, incest), two fairness violations (exam, bonus), and two non-moral scenarios (brand, train; see Table 1), both of which should be judged as "perfectly ok." Following a scenario, participants received either the moral judgment task or the emotion-rating task (in counterbalanced order). We used the same scales as in Study 2. Preliminary analyses revealed no effect of order, so we dropped this factor from the analyses. Following the moral judgment task, participants were asked "How sure are you in your evaluation?" and were given a scale ranging from 1 (*not at all sure*) to 7 (*very sure*). Next, participants received the Moses illusion task (see Appendix B), and then a subscale of the *Identification with All Humanity Scale* (McFarland, Webb, & Brown, 2012). Participants were asked: "How close do you feel to each of the following groups?": *People in my community*, *Italians*, *People around the world* and were given a scale ranging from 1 (*not at all close*) to 5 (*very close*). Finally, participants evaluated 15 violations of everyday moral and social norms on a scale ranging from 1 (*not wrong*) to 4 (*severely wrong*) (see Appendix B).

Results and discussion

Emotion ratings. As in Study 2, the five emotion scales were highly associated (Cronbach's alpha = .92 in the native language condition, Cronbach's alpha = .85 in the foreign language condition). We thus computed an emotion index by taking the mean score over the five scales. These mean emotion scores were submitted to a 2 (Language: foreign vs. native) × 4 (Scenario: 1-4) mixed-factor ANOVA, with repeated measures on scenario. There was no main effect of language, $F(1, 69) = 0.46$, $p = .501$, $f = .08$, but a marginally significant language × scenario interaction, $F(3, 207) = 2.32$, $p = .077$, $f = .18$. Simple one-way ANOVAs revealed that foreign language attenuated emotions for only the dog item ($M_{FL} =$

3.70, CI [3.37, 4.03], M_{NL} = 3.13, CI [2.73, 3.53], $F(1, 72)$ = 4.98, p = .029, f = .26. As in the previous studies, there was a significant main effect of scenario, $F(3, 207)$ = 29.79, $p < .001$, f = .66. Post hoc comparisons indicated that the mean emotion rating of the dog scenario (M = 3.42, CI [3.16, 3.68]) was significantly higher than the mean ratings of the bonus (M = 2.91, CI [2.64, 3.18]) and exam scenarios (M = 2.06, CI [1.83, 2.29]). The mean emotion rating of the incest scenario (M = 3.14, CI [2.88, 3.39]) was significantly higher than the mean emotion rating of the exam scenario.

We next tested whether proficiency in a foreign language is associated with emotion ratings. We created a proficiency score by aggregating a participant's self-ratings in reading and understanding (both scales ranged from 1 = *almost none*, to 5 = *very good*). The highest possible score is 10, which we also assigned to the participants in the native language condition. We found no significant association between proficiency and mean emotion ratings, $r(72)$ = .12, p = .322.

Moral judgments. If the influence of foreign language on moral judgments is mediated by an attenuation of emotion, then we should observe no language effect on moral judgment, or perhaps an effect for only the dog item. The results of a 2 (Language: foreign vs. native) × 4 (Scenario: 1-4) mixed-factor ANOVA do not support this prediction (see Figure 5). There was a significant main effect of language condition, $F(1, 68)$ = 8.28, p = .005, f = .35, which was not qualified by a language × scenario interaction, $F(3, 204)$ = 0.67, p = .573, f = .10. The scenarios were judged less harshly in the foreign language (M = 6.77, CI [6.33, 7.21]) than in the native language (M = 7.65, CI [7.23, 8.07]). There was also a significant main effect of scenario, $F(3, 204)$ = 30.51, $p < .001$, f = .66. The incest item received the highest mean moral wrongness rating (M = 8.15, CI [7.75, 8.56]), followed by the bonus item (M = 7.92, CI [7.45, 8.39]), the dog item (M = 7.47, CI [6.97, 7.97]), and the exam item (M = 5.30, CI [4.67, 5.93]). Post hoc comparisons indicated that the mean

wrongness ratings of the dog item, the incest item and the bonus item were all significantly higher than the mean wrongness rating of the exam item.
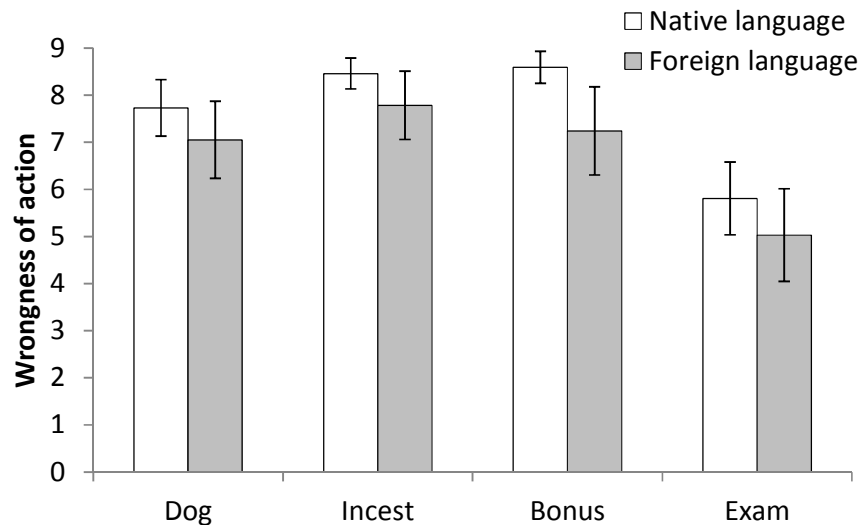

Figure 5. Moral wrongness ratings by scenario and language condition (Study 3). Native language: Italian; Foreign language: German. Higher scores indicate higher moral wrongness ratings. Error bars represent 95% CIs.

We also computed a correlation between proficiency in a foreign language and moral judgment ratings. We found that the higher the language proficiency, the harsher the moral judgment: $r(72) = .25$, $p = .034$.

Correlations between emotion and moral judgment ratings. As in Study 2, within each language condition we computed a correlation between moral judgments and (negative) emotion ratings. Both correlations were statistically significant (native language: $r[35] = .49$, $p = .002$; foreign language: $r[35] = .41$, $p = .012$), and not different from one another ($z = -0.39$, $p = .699$). In both languages, higher negative emotion ratings were associated with more severe moral wrongness judgments.

Confidence ratings. The automatic-processing hypothesis predicts that foreign language would decrease confidence in one's moral evaluations, whereas the controlled-processing hypothesis suggests the opposite. The results from a 2 (Language: foreign vs. native) × 4 (Scenario: 1-4) mixed-factor ANOVA support the automatic-processing hypothesis (see Figure 6). There was a significant main effect of language, $F(1, 68) = 9.61$, $p = .003$, $f = .38$, which was not qualified by a language × scenario interaction, $F(3, 204) = 2.35$, $p = .074$, $f = .18$. Participants in the foreign language condition were less confident in their moral judgments ($M = 6.07$, CI [5.81, 6.33]) than participants in the native language condition ($M = 6.63$, CI [6.38, 6.88]).
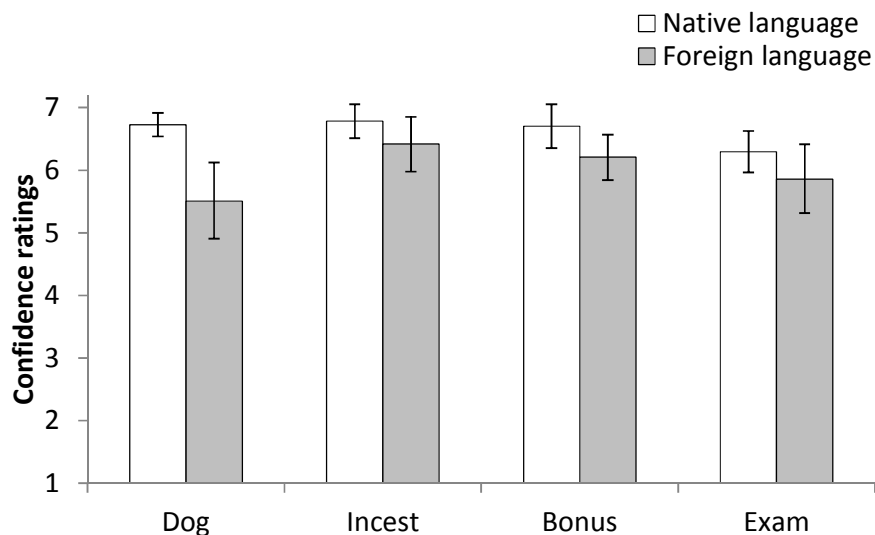
Figure 6. Confidence ratings in one's moral evaluations by scenario and language conditions (Study 3). Native language: Italian; Foreign language: German. Higher scores indicate higher confidence ratings. Bars represent 95% CIs.

There was also a significant main effect of scenario, $F(3, 204) = 4.41$, $p = .005$, $f = .25$. The incest item received the highest mean confidence rating ($M = 6.65$, CI [6.42, 6.88]), followed by the bonus item ($M = 6.46$, CI [6.21, 6.71]), the dog item ($M = 6.18$, CI [5.90, 6.47]), and

the exam item ($M = 6.10$, CI [5.78, 6.43]). Post hoc comparisons indicated that the mean

confidence rating of the incest item was significantly higher than the mean confidence ratings

of the dog and exam items.

We then computed a correlation between proficiency in a foreign language and

confidence ratings. It was significant and positive: $r(72) = .42$, $p < .001$; the higher the

language proficiency, the higher the participants' confidence in their moral judgments.

Moses illusion task. If foreign language promotes analytic reasoning, as the

controlled-processing hypothesis claims, then it should increase the frequency of correct

responses in this task. It did not. In the native language condition 35.1% of participants

responded correctly ("can't say"), compared to 16.2% in the foreign language condition, $\chi^2(1,$

$N = 74) = 3.47$, $p = .062$, $\varphi = -.22$. For the control item, no differences were observed

between the two language conditions, $\chi^2(1, N = 74) = 2.38$, $p = .123$, $\varphi = -.24$.

Identification with All Humanity Scale. If foreign language promotes a

universalistic stance, then we should observe differences in terms of how much participants

identify with close and distant social groups. We analyzed the data using a 2 (Language:

foreign vs. native) × 3 (Social group: people in my community vs. Italians vs. people around

the world) ANOVA, with repeated measures on the last factor. There was no main effect of

language: Participants in the foreign language condition gave similar closeness ratings ($M =$

3.56, CI [3.33, 3.78]) as participants in the native language condition ($M = 3.69$, CI [3.47,

3.92]), $F(1, 71) = 0.75$, $p = .389$, $f = .10$. Also, there was no main effect of social group, $F(2,$

$142) = 1.05$, $p = .353$, $f = .12$, and no language × social group interaction, $F(2, 142) = 0.90$, p

$= .409$, $f = .11$.

Everyday moral and social norms. Here we addressed whether the foreign language

effect generalizes to the evaluation of norm violations that concern relatively harmless and

harmful actions in community and autonomy ethics. To the extent that it does, foreign

language should promote less harsh moral judgments. We tested this hypothesis by conducting two analyses of variance, one treating subjects as a random factor (F_1), the other items (F_2). In accord with the automatic-processing hypothesis, participants in the foreign language condition gave less harsh moral judgments ($M = 2.67$, CI [2.54, 2.80]) than participants in the native language condition ($M = 2.94$, CI [2.83, 3.05]), $F_1(1, 73) = 10.17$, $p = .002$, $f = .45$. This result was robust in the analysis by items, $F_2(1, 14) = 11.76$, $p = .004$. In 13 (out of 15) items, the means were in the expected direction (the exact binomial probability of getting 13 or more hits out of 15 trials is .007, two-tailed). We also computed a correlation between moral judgments and proficiency. It was significant and positive: $r(72) = .36$, $p = .001$; the higher the language proficiency, the harsher the moral judgment.

General Discussion

The use of a foreign language, as opposed to a native language, elicited less harsh moral judgments for actions that violate purity, fairness, and loyalty norms, but have relatively harmless consequences. This was true across three native-foreign language combinations: German-English, Italian-English, and Italian-German. The use of a foreign language also elicited less harsh moral judgments for fifteen violations of everyday social and moral norms in community and autonomy ethics. Thus, the present findings consolidate and extend previous ones regarding the trolley dilemmas (Costa et al., 2014; Geipel et al., 2014). Critically, in contrast to previous studies, the present findings are not open to explanations based on misunderstanding, added assumptions concerning who is involved in the scenarios (e.g., in-group or out-group members), a generic bias that distorts the use of the rating scale (the effect was present in scenarios that induce both low and high levels of acceptance, and was absent from non-moral scenarios), or people reducing a moral judgment to a simple math problem.

The present studies provide limited support for the claim that the effect of foreign language is mediated by an attenuation of emotions. Such an effect was found only for two out of four violations in Study 2. In Study 3 we found a main effect of foreign language on moral judgments, but no attenuation of emotions. The failure to detect a widespread attenuation of emotions could be related to how we measured them. Research suggests that emotional scales with verbal anchors (e.g., 1 = *not at all disgusted* to 5 = *extremely disgusted*) elicit higher ratings when the anchors are in a foreign language than in a native language (*the anchor contraction effect*; see de Langhe, Puntoni, Fernandez, van Osselaer, 2011). Presumably emotional anchors are felt less strongly in a foreign language, and thus participants compensate by selecting more extreme ratings. Another potential issue is that some emotion words might lack direct translation equivalents in a foreign language (Pavlenko, 2008). Future research could overcome these issues by eliciting emotions through emotional scales labeled in the native language, scales that are supplemented by nonverbal cues such as emoticons or colors (see de Langhe et al., 2011, Studies 8 & 9), or by using more direct measures of emotions such as facial affect.

The present findings are not consistent with the idea that foreign language promotes a switch from intuitive to controlled processes (see Keysar et al., 2012; Costa et al., 2014), but rather suggest that intuitive processes remain active (see also Hadjichristidis, Geipel, & Savadori, in press). First, foreign language promoted less confidence in one's moral evaluations. This finding suggests that foreign language makes people judge in accord to weakened or confused intuitions rather than enlightened utilitarian reasoning. An enlightened utilitarian should consider carefully all outcomes and so be confident in his or her decision. Standard economic theory cannot explain certain doubts in a rational agent (see Shafir, Simonson, & Tversky, 1993). Rational agents compute the (expected) utility associated with each option, and choose the one with the highest value (see also Mata et al., 2013). However,

an individual who relies on weak intuitions should be much less confident. The reduction in gut feelings that makes this person less radical in his or her moral positions, also explains the reduced confidence in those positions.

Second, foreign language did not improve performance on the Moses illusion task. Costa and colleagues (Costa et al., 2013, Study 4) have similarly failed to find improved performance on the Cognitive Reflection Test (CRT; Frederick, 2005), a logical task where correct responding necessitates the inhibition of an intuitive answer that is incorrect. These authors suggest that the foreign language effect might be confined to problems that have an emotional component. An independent reason to doubt the controlled-processing hypothesis is that thinking in a foreign language should increase cognitive load, and thus hinder rather than facilitate analytical and deliberative reasoning (see Keysar et al., 2012).

One reason why foreign language might promote less harsh moral judgments can be traced to memory and socio-cultural learning processes. The language in which an event is encoded facilitates its recall (e.g., Marian & Neisser, 2000; Schrauf & Rubin, 2000, 2004). All the moral violations we studied concerned norms that have been learned directly or indirectly through social interactions involving the native language. Therefore, a native language is more likely to activate these social and moral norms than a foreign language. In support of this, Gawinkowska and colleagues (Gawinkowska, Paradowski, & Bilewicz, 2013) demonstrated that bilinguals use stronger words to translate swearwords from a native-to-a-foreign language than vice versa, especially for politically incorrect swearwords, such as ones directed at social groups (*ethnophaulisms*). These authors argue that a foreign language exempts bilinguals from self- or socially-imposed norms, thus making them more prone to offending others (see also Bond & Lai, 1986; Dewaele, 2010).

This account helps explaining the present findings: all five moral transgressions as well as the fifteen violations of everyday moral and social norms involved behaviors which

have been learned and experienced predominantly in contexts in which the native language was used. It can also explain the findings with the trolley dilemmas. The foreign language effect was present in the footbridge dilemma but absent in the trolley dilemma, because only the footbridge dilemma involves a prohibited action (pushing a person; see also Cushman, 2013). Similarly, the effect was absent from the non-moral dilemmas, because these dilemmas did not involve social norms.

A further possibility is that the use of a foreign language might prompt a generic feeling of uncertainty, which in turn promotes less extreme moral judgments. Here we cannot address this hypothesis as the confidence ratings were tied to the moral evaluations. But future studies could examine whether foreign language also reduces confidence in one's responses concerning emotion-neutral items, such as general knowledge questions.

Conclusion

The present research extends the foreign language effect to harmless-but-offensive actions, but also to relatively harmful and harmless violations of everyday social norms. Foreign language promoted less harsh moral judgments and less confidence in one's moral evaluations. The present findings do not support the view that the use of a foreign language turns people into enlightened rationalists, reasoning coldly in terms of utilitarian principles. Rather, the picture that emerges is of people who are guided by a muted intuition, perhaps due to reduced activation of relevant moral and cultural norms. Whatever the final verdict might be in the theoretical arena, studying how foreign language influences moral judgment is of applied interest, as international public policy involves communicating and processing materials in a foreign language before taking decisions that impact on the populations of many countries.

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Footnotes

[1] The principle of description invariance or extensionality holds that the way options are described should not influence a person's preferences about them.

[2] We follow Greene (2014) in using deontological and utilitarian to mean respectively "characteristically deontological" and "characteristically utilitarian" as a function of the response content, not the underlying motivation.

[3] The sample size was determined based on an a-priori power analysis using *G*power* (Faul, Erdfelder, Lang, & Buchner, 2007) with the following settings: statistical power = .80, effect size f = .35 (medium to large effect size, based on Geipel et al., 2014), p = .05, number of groups = 2 (language conditions), number of repeated measures = 4 (scenarios), correlation between repeated measures ρ = 0.3 (estimated). The analysis indicated a minimum sample size of 34. We tested more participants than the power analysis suggested because the present studies were conducted during classes in which a greater number of participants was available (this applies to all reported studies). In the present studies, no interim analyses or stopping rules were applied.

[4] To determine the appropriate sample size we conducted an a-priori power analysis utilizing the estimates from Study 1a: effect size f = .43, alpha level = .05, power = .8, and ρ = 0.4. The minimum sample size suitable to detect a main effect of language condition was 26. [5] We report 95% CIs unless otherwise stated.

[6] The sample size was determined via an a-priori power analysis using the estimates from Study 1b: effect size f = .29, alpha level = .05, power = .8, and ρ = 0.6. The indicated minimum sample size was 68.

[7] We thank Catherine Caldwell-Harris for suggesting this possibility to us.

[8] We thank the action editor, Roger Giner-Sorolla, and an anonymous reviewer for suggesting several of these alternative explanations.

[9] The appropriate sample size was calculated based on an a-priori sample size calculation using the estimates from Study 1b: effect size $f = .29$ (medium effect), alpha level = .05, power = .8, and $\rho = 0.6$. The analysis indicated a minimum sample size of 68.

Appendix A

Details of Participants in the Foreign Language Conditions.

Table A.1

Details of participants in the foreign language conditions.

	Means, 95% CI
Study 1a (*n* = 19)	
Start age of	
English education	8.82, [8.13, 9.54]
Self-ratings of	
language skills in English[a]	3.82, [3.46, 4.14]
Study 1b (*n* = 35)[b]	
Start age of	
English education	9.29, [8.64, 9.91]
Self-ratings of	
language skills in English[a]	3.64, [3.45, 3.78]
Self-ratings of	
comprehension of the materials[c]	97%, [96%, 99%]
Study 2 (*n* = 42)[b]	
Start age of	
English education	8.40, [7.76, 8.98]
Self-ratings of	
language skills in English[a]	3.99, [3.87, 4.17]
Study 3 (*n* = 37)[b]	
Start age of	
German education	11.78, [10.42, 13.22]
Self-ratings of	
language skills in German[d]	3.72, [3.40, 4.00]

Note. [a]Participants evaluated their language skills in terms of conversational fluency, reading, writing, and understanding, each on a 5-point scale (1 = *almost none*, 2 = *poor*, 3 = *fair*, 4 = *good*, 5 = *very good;* scale adapted from Caldwell-Harris & Ayçiçeği-Dinn, 2009). Here we report the mean rating across these scales. [b]All participants had at least an intermediate level certificate (B1 or B2) in the foreign language as specified by the Common European Framework of Reference for Languages (CEFR; see page 24 in: http://www.coe.int/t/dg4/linguistic/Source/Framework_EN.pdf for descriptors). [c]We asked participants to rate how well they understood each scenario on a 6-point scale ranging from 50% (*some understanding*) to 100% (*excellent understanding*). [d]Participants evaluated their language skills in terms of reading and understanding, each on a 5-point scale (1 = *almost none*, 2 = *poor*, 3 = *fair*, 4 = *good*, 5 = *very good*). We report the mean rating across these scales.

Appendix B

English Versions of the Moses Illusion and Everyday Social and Moral Norms Tasks

(Study 3)

Moses illusion task

This task was developed by Erickson and Mattson (1981) (see also Reder &

Kusbit, 1991, and Song & Schwarz, 2008). Following Song and Schwarz (2008),

participants were instructed:

> "You will read a couple of trivia questions and answer them. You can write
> the answer in the blank. In case you do not know the answer, please write
> 'don't know.' You may or may not encounter ill-formed questions which do not
> have correct answers if taken literally. For instance, you might see the question
> 'Garfield is the dog of which cartoon?' In fact, Garfield is not a dog it is a cat.
> Please, write 'can't say' for this type of question."

Following these instructions, participants had to respond to two questions:

(A) *"Which country is famous for cuckoo clocks, chocolate, banks, and pocket knives*?" (control question; correct answer: Switzerland)

(B) *"How many animals of each kind did Moses take on the Ark?"*
    (Moses illusion; correct answer: can't say)

Everyday social and moral norms

These materials were taken from Khemiri, Guterstam, Franck, and Jayaram-

Lindström (2012), who selected them from Mendez, Anderson, and Shapira (2005).

Participants were given to evaluate 15 items, each on a scale ranging from 1 (*not

wrong*) to 4 (*severely wrong*).

In your opinion, how wrong is it to…

1) Fail to keep minor promises
2) Take the last seat on a crowded bus
3) Sell someone a defective car
4) Drive after having one drink
5) Cut in line when in a hurry
6) Don't give blood during blood drives
7) Are mean to someone you don't like
8) Say a white lie to get a reduced fare

9)   Drive out the homeless from your neighborhood
10) Not help someone pick up their dropped papers
11) Keep excess-change at a store
12) Not offer to help after an accident
13) Ignore a hungry stranger
14) Fail to vote in minor elections
15) Keep money found on the ground

Chapter 4

Testing three explanations for the foreign language effect on moral judgment

This chapter is based on the following original article:

Abstract

Research has shown that the use of a foreign language affects moral judgment, but little is known about the underlying processes. Here, we assessed three hypotheses: (1) foreign language triggers controlled processing, focusing attention on the final outcomes; (2) foreign language induces an abstract mindset, focusing attention on agents' motives; (3) moral judgment remains intuition-based, but aversive signals related to norm violations become attenuated, promoting more positive moral judgments. We found that a foreign language induced less harsh moral evaluations of offensive actions attenuated by positive contextual circumstances and more positive evaluations of helping actions attenuated by negative contextual circumstances. Contrary to the predictions derived from the first and second hypotheses, participants' choices as well as justifications reveal that foreign language did not shift attention to end outcomes, and did not influence mindset. The findings instead provide support for the third, intuition-based account.

Keywords: foreign language, moral judgment, construal level, intention

**Testing three explanations for the foreign language effect on
moral judgment**

As a result of globalization, citizens and policymakers often judge and decide based on information communicated in a foreign language, mostly English (see Crystal, 2003). By a foreign language we mean a non-native language that has been learned in a classroom context rather than by immersion in a culture (see Pavlenko, 2012). Communication in a foreign language is a common practice in multinational companies and international organizations, such as the United Nations, North Atlantic Treaty Organization and Organization of Petroleum Exporting Countries, whose decisions have global impact. A great number of such decisions—Should we impose economic sanctions? Should we go to war?—involve a moral evaluation of options. Interestingly, a foreign language has been shown to systematically sway moral evaluations towards a consequentialist choice (Cipolletti, McFarlane, & Weissglass, 2015; Costa et al., 2014; Geipel, Hadjichristidis, & Surian, 2014). The purpose of this article is to empirically access three hypotheses concerning why foreign language affects moral judgment. Below we summarize the available evidence, present the three hypotheses, and give an overview of the experiments reported in the present study.

Foreign language alters moral judgment: The evidence

The first studies on foreign language effects on moral judgment employed the famous trolley dilemmas (Cipolletti, et al., 2015; Costa et al., 2014; Geipel, Hadjichristidis, & Surian, 2014). In these dilemmas, participants are informed that a runaway trolley is in a course to kill five workmen unless an action is taken. In one version of the dilemma—*footbridge*—the action involves pushing a stranger of a footbridge into the path of the trolley. In another—*standard trolley*—the action involves hitting a switch that would redirect the trolley to alternate tracks where one

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worker is standing. Participants have to decide whether or not it is permissible to perform the action. Although these dilemmas are similar at an abstract level—*Would you kill 1 to save 5?*—they are psychologically distinct. The majority of participants judge to push the stranger as not permissible, but they find it permissible to hit the switch (e.g., Cushman, Young, & Hauser, 2006; Greene, Cushman et al., 2009; Greene, Sommerville et al., 2001; Pellizzoni, Siegal, & Surian, 2010). When these dilemmas were described in a foreign language, the endorsement of the action of the footbridge dilemma increased, while that of the standard trolley dilemma remained unaltered.

Subsequent research examined the foreign language effect with negative actions (Geipel et al., 2015), such as siblings having sex, attenuated by positive contextual circumstances, such as the siblings used precautions. The use of a foreign language induced less harsh moral evaluations and less confidence in them. These findings are important as they show that the foreign language effect is not limited to dilemmas involving a numerical tradeoff (1 vs. 5). This work also empirically discounted a number of possible explanations for the foreign language effect, such as that participants misunderstood the materials, adopted a more universalistic stance, or thought that the characters in the scenarios were foreigners. Participants were also presented with everyday violations of social and moral norms, such as cutting in line when in a hurry, and selling someone a defective car. The use of a foreign language induced less harsh moral evaluations even for these commonplace and potentially harmful actions.

Three hypotheses/explanations of the foreign language effects

Before delving into the hypotheses, we briefly introduce our theoretical backdrop, which is the dual-process theory of moral judgment (e.g., Greene et al.,

2001; 2008). According to this theory, moral judgments result from a competition between two systems: a fast, intuitive, affective system and a slow, controlled, deliberative system. These two systems are linked to two different modes of moral judgment. The intuitive system is linked to a deontological mode of moral judgment, which relies on principles such as to avoid harm intentionally caused to innocent others. The controlled system is linked to a consequentialist mode of moral judgment, which involves acting in a manner as to maximize net benefit. In the case of the footbridge dilemma, a deontological perspective would focus attention on the rights of the stranger and veto the action, while the consequentialist perspective on the greater good and vote for the action. Greene's dual-process theory explains the typical findings with the trolley dilemmas by claiming that when the proposed action prompts a strong emotional response—e.g., pushing a person—then the deontological response wins. When it doesn't—e.g., hitting a switch—then the consequentialist response may surface.

In the case of consensual and safe incest between siblings, a deontological perspective would focus attention on the violation—incest—and thus trigger a harsh moral judgment, while the consequentialist perspective would focus attention on its harmless outcome and thus promote a less harsh moral judgment (see Paxton, Ungar, & Greene, 2012).[1]

Hypothesis 1: Foreign language triggers controlled processes. One possible explanation is that foreign language triggers cognitive and emotional distance, which in turn promotes controlled processing (Costa et al., 2014; Keysar, Hayakawa, & An, 2012). We call this the *controlled processing hypothesis*. This hypothesis was suggested by the foreign language effect on the trolley dilemmas (Cipolletti et al., 2015; Costa et al., 2014; Geipel et al., 2014). The increase in controlled processing is

felt in the footbridge dilemma because this dilemma typically prompts intuitive processing (deontological judgments), but not in the standard trolley dilemma that typically triggers controlled processing (consequentialist judgments). The controlled processing hypothesis can also explain why foreign language promoted less harsh moral evaluations towards negative actions attenuated by positive contextual circumstances, such as a man eating his dead dog (Geipel et al., 2015)—because it shifted attention to their relatively harmless outcomes (e.g., the dog was dead). However, this hypothesis cannot explain why foreign language also decreased condemnation of potentially harmful everyday violations of moral and social norms, such as selling someone a defective car (Geipel et al., 2015) and why it failed to suppress erroneous intuitive responses in non-moral reasoning tasks (Costa et al., 2014; Geipel et al., 2015).

Hypothesis 2: Foreign language triggers an abstract mindset. A distinct and as yet unexplored possibility is that foreign language influences moral judgment by affecting mental representation (Costa, Foucart, Arnon, Aparici, & Apesteguia, 2014; see also Keysar et al., 2012). A moral situation can be mentally construed on a relatively more concrete (focusing on *how* an action is performed) or abstract way (focusing on *why* an action is performed). Studies suggest that level of construal influences ethical evaluations (Gong & Medin, 2012, 2014; Eyal, Liberman, & Trope, 2008, 2014; Žeželj & Jokić, 2014). Gong and Medin (2012), for example, primed participants either with an abstract mindset by asking them to respond to a series of *why* questions or with a concrete mindset by asking them to respond to a series of *how* questions. The abstract mindset priming led to more lenient ethical evaluations of transgressions, such as eating one's dead pet (but see Eyal et al., 2008; Žeželj & Jokić, 2014). Presumably an abstract mindset focuses attention to the contextual

circumstances (Eyal, Liberman, & Trope, 2014). Related to the present research, the use of a foreign language might influence moral judgment by favoring an abstract mindset (see Costa et al., 2014). We call this the *abstract mindset hypothesis*. This hypothesis can directly explain the findings with negative actions attenuated by positive contextual circumstances, and potentially also the findings with the trolley dilemmas.

Hypothesis 3: Foreign language acts through the intuitive system.

According to this hypothesis, using a foreign language distances people from intuition and gut-feelings, but the moral machinery remains on intuitive mode (Geipel et al., 2015). We call this the *intuitive processing hypothesis*. The idea is that foreign language influences moral evaluations by attenuating the aversive signals that offensive actions, such as pushing a person or cheating in an exam, automatically trigger when printed in a native language (see Haidt, 2001). This attenuation might stem from a reduced mental accessibility of moral and social norms (for evidence, see Bond & Lai, 1986; Dewaele, 2012; Gawinkowska; Paradowski, & Bilewicz, 2013), which are typically learned through social interactions that involve the native language. As memories are language specific (e.g., Marian & Neisser, 2000; Schrauf & Rubin, 2000, 2004), a foreign language might activate them to a lesser extent.

This hypothesis can explain the results of the trolley dilemmas, as well as the increased leniency towards harmless and harmful violations of social and moral norms (Geipel et al., 2015). When printed in a foreign language, intuition sends weaker signals that these actions are wrong. It can also explain why foreign language decreased confidence in moral evaluations (Geipel et al., 2015). Confidence ratings might have tracked the strength of the intuition that these actions are wrong. Finally, it can straightforwardly explain the null effect in the non-moral reasoning tasks.

Present studies

The purpose of the present research was to assess these three hypotheses. In Study 1, following Geipel et al. (2015), we asked participants to evaluate the ethicality of negative actions attenuated by positive contextual circumstances (e.g., a manager attempts to unfairly favor an employee, but he fails in doing so). However, for the first time, here we also asked participants to justify their evaluations. If foreign language prompts controlled processing, then participants should be aware of the contents of their moral reasoning (e.g., Darlow & Sloman, 2010). And if participants' moral reasoning concerns the application of utilitarian principles, then their justifications should focus on end outcomes (Paxton & Greene, 2010). However, if the moral machinery remains on the intuitive mode, then we should observe no difference in justifications between the two language conditions. For example, participants should be equally unable to justify their responses (*moral dumbfounding*; Haidt, Björklund, & Murphy, 2000). Due to the added cognitive load involved in processing information in a foreign language, it could be that a foreign language might increase moral dumbfounding.

In Study 1, we also assessed the abstract mindset hypothesis by means of the Behavioral Identification Form (BIF; Vallacher & Wegner, 1989). This measure is composed of a series of target actions (e.g., *Reading an article*) followed by two restatements: a concrete restatement that emphasizes *how* the action is performed (e.g., *Following lines*), and an abstract restatement that emphasizes *why* it is performed (e.g., *Gaining knowledge*). For each target action, participants have to choose the restatement that best captures it. If, with respect to the native language, a foreign language promotes an abstract mindset, then it should increase the selection of

abstract restatements. In Study 2, we further tested this prediction by using a new version of the BIF where the target actions are moral violations.

Study 1

Methods

Participants. The participants were 88 German majors from the University of Trento (82 females, 6 males, M_{age} = 20.03 years, age range: 18-28 years).[2] Fifty were randomly assigned to the foreign language condition and received the entire questionnaire in German, and 38 to the native language condition and received it in Italian. In all studies, the different language versions of the questionnaires were created by bilinguals and double-checked for correctness and equivalence of meaning by independent native language judges.

The majority of participants in the foreign language condition had a B2 qualification in German (independent user— *vantage*), with a range from A2 (basic user—*way stage*) to C1 (proficient user—*advanced*) as specified by the *Common European Framework of Reference for Languages: Learning, Teaching, Assessment* (CEFR; Council of Europe, 2001). Details concerning the participants' foreign language proficiency (for all studies) are presented in Appendix A.

Materials and procedure. Participants were presented with four moral scenarios (see Haidt, 2001; Eyal et al., 2008; Geipel et al., 2015): *dog* (eating one's dead dog), *siblings* (siblings having consensual and safe sex), *exam* (cheating in an exam), and *bonus* (intention to unfairly allocate a bonus among co-workers). They were also presented with two control non-moral scenarios which they should judge as "perfectly ok" (for the full materials, see Online Appendix). Participants were instructed to imagine that the violations took place in Italy and involved Italians.

Following each scenario, participants were asked to make a moral judgment ("How wrong do you find [action]?") in a scale from 1 = *absolutely ok* to 9 = *absolutely wrong*, rate their confidence in that judgment ("How sure are you in your evaluation?") in a scale from 1 = *not at all sure* to 7 = *very sure*, rate five emotions in response to the scenario ("Thinking about the scenario I just read, I feel upset [worried, sad, angry, and disgusted]") in a 5-point scale (1 = *very slightly or not at all*, 2 = *a little*, 3 = *moderately*, 4 = *quite a bit*, 5 = *extremely*), and justify their moral evaluations ("Why do you find the [action] morally wrong or morally ok?") by selecting either (a) "I can't explain why I feel this behavior is morally wrong or not," or (b) "This action is right or wrong because ….." In the emotion rating tasks, the 5-point scale was adapted from Watson, Clark, and Tellegen (1988). In the justification task, the wording of option (a) was adapted from Uhlmann and Zhu (2014) and its selection was coded as a moral dumbfounding response. The presentation order of the moral judgment and emotion tasks was counterbalanced. Preliminary analyses revealed no order effect, and thus we dropped this factor from the analysis.

Following these tasks, participants completed part of the Behavior Identification Form (BIF; Vallacher & Wegner, 1989). They were presented with 12 target behaviors each followed by a relatively concrete and a relatively abstract restatement. Their task was to choose the restatement that best described the target behavior.

Finally, participants in the foreign language condition self-assessed their foreign language proficiency and translated the four moral scenarios. Five participants mistranslated one item each. We excluded the scores for these items from the analyses (including them does not affect the main pattern of findings).

Results

Replicating Geipel et al. (2015, Study 3), we found that the use of a foreign language significantly reduced confidence ratings. Due to space restrictions, we will not discuss further these results (see Supplementary Materials).

Moral judgments. We submitted the wrongness ratings of the moral scenarios into a 2 (Language) × 4 (Moral scenario) mixed-factor ANOVA. Consistent with previous research, the use of the foreign language promoted less harsh moral evaluations ($M = 7.13$, CI [6.76, 7.49]) than the native language ($M = 7.91$, CI [7.52, 8.30]), $F(1, 79) = 8.46$, $p = .005$, $f = .31$ (see Figure 1). There was a main effect of scenario, $F(3, 237) = 16.62$, $p < .001$, $f = .45$, but no Language × Scenario interaction, $F(3, 237) = 1.48$, $p = .221$, $f = .14$.
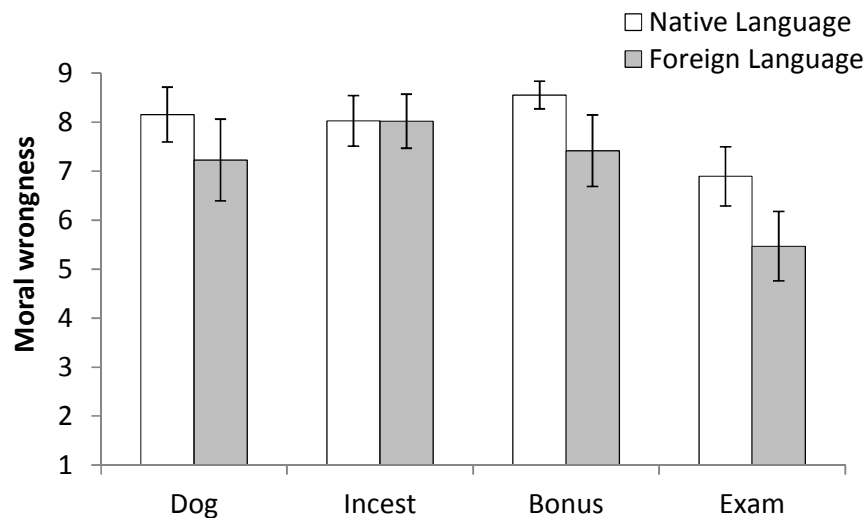

Figure 1. Mean moral wrongness ratings for each scenario by language condition in Study 1. The native language was Italian, and German the foreign language. Error bars indicate 95% CIs.

A similar analyses performed for the non-moral scenarios showed no significant differences between the foreign language condition ($M = 0.94$, CI [0.53, 1.35]) and the native language condition ($M = 0.66$, CI [0.20, 1.12]), $F(1, 85) = 0.83$, $p = .366, f = .10$. There was no effect of scenario, and no Language × Scenario interaction (all $ps > .130$).

Emotion ratings. If foreign language acts through affect, then it should decrease emotional ratings for the moral violations. As the five emotion scales were highly associated (Cronbach's alpha = .81), we computed an emotion index by taking the mean score over the five scales. We submitted the resulting scores into a 2 (Language) × 4 (Moral scenario) mixed-factor ANOVA. Participants in the foreign language condition indicated similar emotion ratings ($M = 3.11$, CI [2.93, 3.29]) as those in the native language condition ($M = 3.04$, CI [2.84, 3.24]), $F(1, 83) = 0.27$, $p = .607, f = .05$. There was a significant main effect of scenario, $F(2.56, 212.38) = 34.90$, $p < .001, f = .65$, but no Language × Scenario interaction, $F(2.56, 212.38) = 0.91$, $p = .437, f = .11$.[3]

Dumbfounding. A dumbfounded response (selection of option a.) was coded as 1, whereas a justification (selection of option b.; see materials section) as 0. For each participant, we calculated a mean dumbfounding score. Overall, participants in the foreign language condition were significantly more dumbfounded ($M = 0.41$) than those in the native language condition ($M = 0.22$), $F(1, 85) = 7.63$, $p = .007, f = .30$. Individual scenario analyses on the frequency of dumbfounded responses revealed a similar pattern (see Figure 2a): bonus (FL: 34.8% vs. NL: 13.2%), $\chi^2 (1, N = 85) = 5.19$, $p = .023$, $\varphi = .25$, exam (FL: 38.3% vs. NL: 13.2%), $\chi^2 (1, N = 85) = 6.73$, $p = .009$, $\varphi = .28$, dog (FL: 41.3% vs. NL: 34.2%), $\chi^2 (1, N = 85) = 0.44$, $p = .505$, $\varphi = .07$, and incest (FL: 46.8% vs. NL: 28.9%), $\chi^2 (1, N = 85) = 2.82$, $p = .093$, $\varphi = .18$.

Moreover, moral dumbfounding increased as language proficiency decreased, $r(85) =$ $-.34$, $p = .001$. These results challenge the controlled processing hypothesis but are consistent with the predictions derived from the intuitive processing hypothesis.

Type of justification. We next examined the justifications (how participants filled in the blank in option b.; see materials section). Two independent raters, one of whom was blind to the hypothesis of the study, coded the justifications as either utilitarian (e.g., "the dog was already dead") or non-utilitarian (e.g., "it is not ok to eat pets, they are family members"). An inter-rater reliability analysis showed a high consistency between the raters; the Kappa coefficient was .93, $p < .001$, CI [.455, .837]. Inconsistencies were resolved through discussion. Only a minority of justifications (6.49%) appealed to consequences (see Figure 2b). Critically, utilitarian justifications did not vary across language conditions (FL: 4.84% vs. NL: 8.41%), $F(1, 75) = 1.23$, $p = .272$, $f = .13$.

Behavior Identification Form. The selection of an abstract restatement was coded as 1 and that of a concrete restatement as 0. For each participant, we calculated an abstract mindset score by summing the scores over the 12 behaviors (there were no missing values; min = 0; max = 12). If foreign language promotes an abstract mindset, then we should observe higher scores in that condition. This was not the case. The means were similar: ($M_{FL} = 7.10$, CI [6.44, 7.76] vs. $M_{NL} = 7.26$, CI [6.50, 8.03]), $F(1, 85) = 0.10$, $p = .748$, $f = .03$.

Discussion

The results of Study 1 are consistent with the predictions derived from the intuitive processing hypothesis. Replicating previous studies (Geipel et al., 2015), the use of a foreign language promoted less harsh moral judgments, and this effect was not carried through affect.
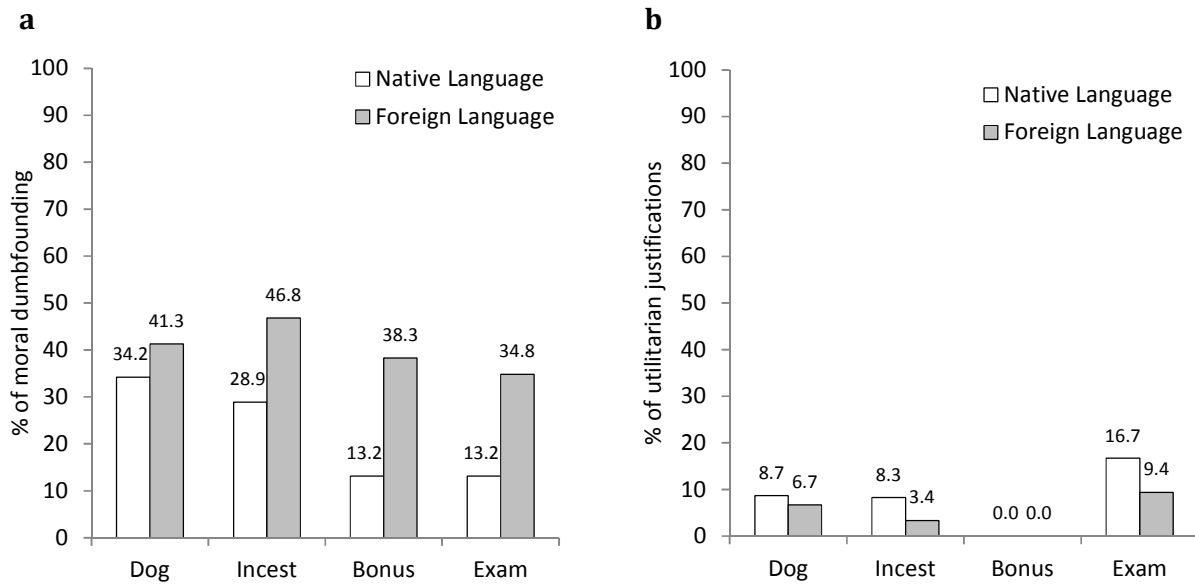
a

b

Figure 2. Percentage of moral dumfounding (a) and percentage of utilitarian justifications (b) by scenario and language condition in Study 1. The native language was Italian, and German the foreign language.

As proposed by Geipel et al. (2015), the use of a foreign language might instead influence moral judgment by reducing the activation of relevant moral and social norms. Contrary to the controlled processing hypothesis, we did not observe an increase in utilitarian justifications: in both language conditions out of all participants that justified their moral evaluations, more than 90% gave a non-utilitarian justification. Moreover, the evidence suggests that the use of a foreign language increases the incidence of moral dumbfounding. Finally, contrary to the abstract mindset hypothesis, we did not observe an increase in the selection of abstract restatements in the foreign language condition.

Study 2

In Study 2, as a further test of the abstract mindset hypothesis, we used a modified version of the BIF (adapted from Eyal et al., 2008). Instead of using neutral target actions (e.g., locking a door), here we used moral violations (e.g., copying in an exam). Abstract restatements referred to the relevant abstract moral value (e.g., cheating in an exam), whereas concrete restatements to the means of carrying out the action (e.g., peeking into another student's exam). If foreign language promotes an abstract mindset, then it should increase the selection of abstract restatements.

Methods

Participants. Participants were 73 English major students from the University of Trento (60 females, 12 males, 1 unknown, M_{age} = 22.07 years, age range: 19–64 years).[4] Thirty-seven were randomly assigned to the foreign language condition and received the questionnaire in English, and 36 to the native language condition and received it in Italian. The majority of participants in the foreign language condition had a B2 qualification in English (independent user—*vantage*), with a range from A2 (basic user—*way stage*) to C1 (proficient user—*advanced*) (CEFR; Council of Europe, 2001).

Materials and Procedure. The target statements were the exam and incest items of Study 1 along with two new items: flag (a person cleaning a house using the national flag) and hands (a girl eats with her hands) (both adapted from Haidt, Koller, & Dias, 1993). Each violation was followed by an abstract and a concrete restatement (i.e., *Cheating in an exam* vs. *Peeking into another student's exam*; *Incest between siblings* vs. *Sexual intercourse between siblings*; *Desecrating a national symbol* vs. *Cutting a flag into rags*; *Disrespecting family rules* vs. *Picking food with fingers*). The order of the abstract-concrete restatements was randomized, but the same order was

used for all participants. Participants had to choose the restatement that best described the target statement.

Results and Discussion

The selection of an abstract restatement was coded as 1 and that of a concrete restatement as 0. For each participant, we calculated an abstract mindset score by summing the scores over the four items (min = 0; max = 4). Language had no influence on mindset: (M_{FL} = 2.00, CI [1.70, 2.29] vs. M_{NL} = 2.00, CI [1.63, 2.33]), $F(1, 71) < 0.01$, $p > .999$, $f < .01$. A Mann-Whitney test yielded similar results: (Mdn_{FL} = 2 vs. Mdn_{NL} = 2), $U = 660.50$, $p = .949$. We also conducted separate χ^2 tests for each item comparing the frequency of participants that chose the abstract versus concrete restatement between the language conditions. None of the resulting χ^2 tests was significant (all ps > .50). In sum, the results of Study 2 dovetail with those of Study 1 and suggest that foreign language does not influence mindset.

Study 3

In Study 1, we presented participants with negative actions performed under attenuating circumstances. Here, for the first time, we investigated instead positive actions (e.g., a fashion company donates money to a charity project) whose positive value is attenuated by questionable motivations (e.g., the donations was performed to improve the company's reputation). The intuitive processing hypothesis predicts that a foreign language will prompt stronger approvals by dampening the aversive reaction that the questionable motivations trigger. This could result from a reduced activation of the principles that link action evaluation to agents' underlying motivations (actions are good only if performed for the 'right' reasons). The abstract mindset hypothesis predicts that a foreign language would promote stronger condemnation by focusing the attention to their dubious motivations (see Gong & Medin, 2012, Study 3). It is

harder to come up with a single prediction for the controlled processing hypothesis. If participants become hardline utilitarians, then foreign language should promote *more* positive ethical evaluations, as the end outcomes are positive. But an increase in cognitive reflection has been shown to trigger a careful consideration of intentions (see Pinillos, Smith, Nair, Marchetto, & Mun, 2011; see also Piaget, 1965). If this happens, then it should promote *less* positive ethical evaluations. As control items we included two helping actions (helping a mother in need or a poor man) with no mention of motivations, for which we predicted no language effect.

Methods

Participants. Participants were 107 volunteers (79 female, 24 male, 3 unknown; M_{age} = 25.8 years, age range: 20–59 years).[5] Fifty-six native Italian speakers completed a paper-and-pencil questionnaire during a lecture, and 51 native German speakers completed an online version of the study. The foreign language for both groups was English. Preliminary analyses revealed no differences in how foreign language influenced moral evaluations in the Italian and German groups, and so we combined them. Altogether, there were 47 participants assigned to the native language condition (German or Italian), and 60 to the foreign language condition (English).

Materials and Procedure. Participants judged the moral goodness (0 = *not at all good*, 9 = *extremely good*) of three target scenarios (the agents' motivations were given) and two control scenarios (the agents' motivations were not given). The moral scenarios involved helping actions underpinned by potentially dubious motivations (adapted from Eyal et al., 2008): company (a fashion company donates money to charity possibly to increase its profit), inheritance (a wealthy elderly man donates money to charity to avoid family quarrels), and adoption (a couple adopts a disabled child possibly to receive money from the state). The control scenarios involved

helpful actions with no mention of motivations (adapted from Seidel & Prinz, 2012):

mother (helping a mother with a baby carriage), and poor man (giving money to a

poor man).

Results

We submitted the goodness ratings of the target scenarios to a 2 (Language) ×

3 (Scenario) mixed-factor ANOVA. As predicted by the intuitive processing

hypothesis, foreign language promoted more positive moral evaluations ($M = 6.56$, CI

[6.16, 6.95]) than the native language ($M = 5.92$, CI [5.48, 6.36]), $F(1, 105) = 4.52$, $p =$

.036, $f = .20$ (see Figure 3). There was no effect of scenario, $F(2, 210) = 0.03$, $p =$

.971, $f < .01$, and no Language × Scenario interaction, $F(2, 210) = 0.51$, $p = .602$, $f =$
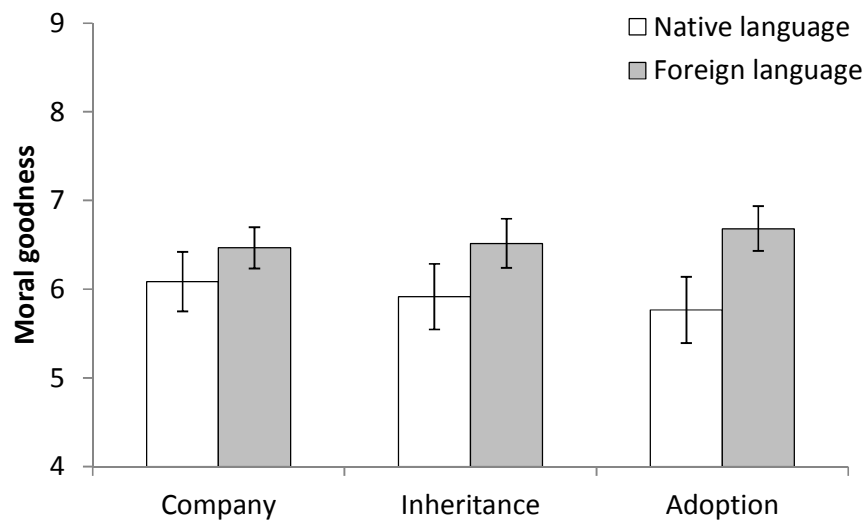
.07.

Figure 3. Mean moral goodness ratings by scenario and language condition in Study

3. The native language was Italian or German, and English the foreign language. Error

bars indicate standard errors of the mean.

For the control scenarios, a similar analysis revealed no language effect, $F(1, 105) = 0.54$, $p = .466$, $f = .07$. The foreign language induced similar goodness ratings ($M = 6.81$, CI [6.45, 7.17]) as the native language ($M = 7.01$, CI [6.60, 7.42]). There was an effect of scenario, $F(1, 105) = 135.50$, $p < .001$, $f = 1.14$, but no Language × Scenario interaction, $F(1, 105) = 3.69$, $p = .057$, $f = .19$.

Discussion

Consistent with the intuitive processing hypothesis, in Study 3 we found that the use of a foreign language increases approvals for helpful actions that are tainted by dubious motivations. Note that, in contrast to Study 1 and previous studies (Geipel et al., 2015), here we found that foreign language induced more extreme ratings with respect to the native language. This finding is important because it helps to discount an alternative explanation to which previous results were open: The use of a foreign language might induce a subjective feeling of uncertainty, which in turn prompts less extreme moral judgments (see Geipel et al., 2015). Moreover, the results of Study 3 challenge the abstract mindset hypothesis that foreign language focuses attention on motivations. Had it done so, moral evaluations should have been more negative.

General Discussion

We explored three hypotheses concerning *how* the use of a foreign language influences moral judgment: (1) by triggering controlled processing, (2) by promoting an abstract mindset, and (3) by reducing aversion towards the morally negative aspects of a situation. Challenging the controlled processing hypothesis, foreign language not only failed to promote utilitarian justifications but it also increased moral dumbfounding (Study 1). In contrast to the abstract mindset hypothesis, foreign language did not influence mindset (Studies 1 and 2). The present results are instead consistent with the intuitive processing hypothesis. Foreign language promoted more

positive moral evaluations (Studies 1 and 3) while justifications remained non-utilitarian (Study 1). This is a first step in cast light on the processes underpinning the foreign language effect on moral judgment. However, the intuitive processing hypothesis is admittedly vague and can be seen as a placeholder for a family of more specific hypotheses. Below we discuss several possibilities and propose how they could be assessed empirically in future investigations.

One possibility is that a foreign language might promote a positivity bias in moral evaluations by triggering more positive affect than the native language (see Hadjichristidis, Geipel, & Savadori, 2015). There are two specific proposals of why a foreign language might promote a positivity bias. First, reading text in a foreign language might trigger automatic protective mechanisms that inhibit access to distressing content (Wu & Thierry, 2012). Second, social interaction in the context of learning a foreign language preferentially focuses on positive contents (Sheikh & Titone, 2015; see also the Pollyanna principle by Boucher & Osgood, 1969). Contrary to the proposal that foreign language influences moral judgment by triggering overall more positive affect, in Study 1 we failed to detect language differences in several emotion scales (see also Geipel et al., 2015, Study 3). The failure to detect such differences could be linked to the anchor contraction effect (Langhe de, Puntoni, & Osselaer van, 2011), which is the tendency to give more intense emotion ratings when the verbal anchors of the scale are presented in a foreign rather than in the native language.

Alternatively, the use of a foreign language might influence intuitive processing by reducing access to relevant normative knowledge (Geipel et al., 2015; see also Bond & Lai, 1986; Dewaele, 2010; Gawinkowska et al., 2013). Evidence comes from a study showing that foreign language promotes less condemnation of

violations of everyday social and moral norms such as cutting in line when in hurry (Geipel et al., 2015). The present research adds that this effect extends to approvals of helpful actions tainted by dubious motives, suggesting a reduced activation also of the principles that link action evaluation to agents' underlying motivations. The use of a foreign language might relax the criteria that an action has to meet to be judged as 'good'. Consistent with this view, studies outside the domain of moral judgment support that the use of a foreign language can reduce culturally transmitted restrictions. For example, participants speak longer about embarrassing topics in a foreign versus a native language (Bond & Lai, 1986), report to feel their lies less strongly (Caldwell-Harris & Ayçiçeği-Dinn, 2009), and are more willing to use politically incorrect swearwords (Gawinkowska et al., 2013). Similarly, psychoanalysts suggested that multilingual patients can display different selves depending on the language used during psychoanalysis. Most studies agree that anxious memories are deep-rooted in the native language, while a later learned language might act as a distancing mechanism (for an excellent review, see Pavlenko, 2009, Chapter 2).

A third version of the intuitive processing account focuses on cognitive load. Participants in the foreign language condition might have weighed less the agents' intentions in their moral evaluations due to the added cognitive load involved in processing information printed in a foreign language (Buon, Jacob, Loissel, & Dupoux, 2012). Buon et al. (2012) using animated cartoons examined situations where an agent unintentionally causes harm to a victim. In their moral evaluations, participants under cognitive load weighted less the absence of a harmful intention than did control participants. In brief, the use of a foreign language might reduce the import of intentions in ethical judgments. This can explain previous results showing

that foreign language increases willingness to sacrifice one person to save five if the action involves intentional harm (footbridge dilemma) rather than harm as a side effect (standard trolley dilemma; Costa et al., 2014). It can also explain why foreign language promoted more lenient moral judgments for offensive actions performed under positive contextual circumstances (Study 1; Geipel et al., 2015). This effect was particularly evident for the bonus and exam scenarios, both of which explicitly involved bad intentions (favoritism, cheating). It also predicts more positive ethical evaluations for actions that are ultimately helpful but are backed up by dubious intentions since such intentions are weighted less in the foreign language condition, as we found in Study 3.

A crucial prediction of this third account is that a foreign language will not always promote a positivity bias in moral evaluations. Consider, for example, scenarios involving actions with good intentions (an individual gives a homeless person his jacket) and bad outcomes (other people beat the homeless person thinking that he had stolen the jacket). Unlike the previous accounts, in this context the intention account would predict harsher moral judgment.

Conclusion

The present research corroborates previous findings showing that foreign language use influences moral evaluations of offensive behaviors performed under positive attenuating circumstances. Moreover, it shows that the foreign language effect extends to helpful actions performed under negative attenuating circumstances. In both cases, the use of a foreign language promoted more positive moral evaluations. The present studies challenge the hypotheses that foreign language acts by promoting deliberative processes or an abstract mindset. Rather, they suggest that foreign language exerts its influence on information processing from the 'inside'—

through intuitive pathways. At times this 'muting' of intuition can be advantageous, it may free judgment and choice from deep-rooted biases such as racial and gender stereotypes, while at others it may have a less desirable consequence, it might make people more callous towards the suffering of others.

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Footnotes

[1] We follow Greene (2014) in using deontological and consequentialist to mean "characteristically deontological" and "characteristically consequentialist" as a function of response content, not the underlying motivation.

[2] We conducted an a–priori sample size calculation using *G*power* (Faul, Erdfelder, Lang, & Buchner, 2007) with the following settings: effect size $f = 0.35$ (medium-high, based on Geipel et al., 2015), alpha level = .05, power = .8, number of groups = 2 (language conditions), number of repeated measures = 4 (scenarios), correlation between repeated measures $\rho = 0.46$ (based on Geipel et al., 2015). The calculation indicated a minimum sample size of 42. Here and throughout we tested more participants because the present studies were conducted during classes in which a greater number of participants was available. Also, in all studies no interim analyses or stopping rules were applied.

[3] Mauchly's test indicated that the assumption of sphericity had been violated, $\chi^2 (5, N = 85) = 19.86, p = .001$, therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity ($\varepsilon = .85$).

[4] We conducted an a–priori sample size calculation using *G*power* (Faul et al., 2007). The parameters were set as follows: effect size $f = 0.35$ (medium-high, based on Geipel et al., 2015), alpha level = .05, power = .8, and number of groups = 2. The calculation indicated a minimum sample size of 84.

[5] We conducted an a–priori sample size calculation using *G*power* (Faul et al., 2007). The parameters were set as follows: effect size $f = 0.31$ (medium-high, based on Study 1), alpha level = .05, power = .95, number of groups = 2, number of repeated measures = 3, and correlation between repeated measures $\rho = 0.38$ (based on Study 1). The calculation indicated a minimum sample size of 86.

Appendix A

Details of Participants in the Foreign Language Conditions.

Table A.1

Details of Participants In The Foreign Language Conditions.

	Means, 95% CI
Study 1 (*n* = 50)	
Start age of	
German education	11.26, [9.91, 12.72]
Self-ratings of	
language skills in German[a]	3.65, [3.41, 3.89]
Study 2 (*n* = 37)[b]	
Start age of	
English education	8.80, [8.00, 9.69]
Self-ratings of	
language skills in English[b]	3.79, [3.64, 3.93]
Study 3 (*n* = 60)[b]	
Start age of	
English education	8.40, [7.76, 8.98]
Self-ratings of	
language skills in English[b]	3.89, [3.72, 4.06]
Self-ratings of	
comprehension of the materials[c]	95%, [94%, 97%]

Note. [a] Participants self-assessed their German language skills in terms of *reading* and *understanding*, each on a 5-point scale (1 = *almost none*, 2 = *poor*, 3 = *fair*, 4 = *good*, 5 = *very good;* scale adapted from Caldwell-Harris & Ayçiçeği-Dinn, 2009). Here we report the mean rating across the two items. [b] Participants evaluated their English language skills in terms of *conversational fluency*, *reading*, *writing*, and *understanding*, each on a 5-point scale (1 = *almost none*, 2 = *poor*, 3 = *fair*, 4 = *good*, 5 = *very good*). We report the mean rating across these scales. [c] We asked participants to rate how well they understood each scenario on a 6-point scale ranging from 50% (*some understanding*) to 100% (*excellent understanding*).

Chapter 5

The effect of foreign language in judgments of risk and benefit: The role of affect

This chapter is based on the following original article:

Abstract

As a result of globalization, policy makers and citizens are increasingly communicating in a foreign language. This article investigates whether communicating in a foreign language influences lay judgments of risk and benefit regarding specific hazards such as "traveling by airplane," "climate change," and "biotechnology." Merging findings from bilingual and risk perception research, we hypothesized that stimuli described in a foreign language, as opposed to the native tongue, would prompt less negative overall affect and through that induce lower judgments of risk and higher judgments of benefit. Two studies support this *foreign language hypothesis*. Contrary to recent proposals that foreign language influences judgment by promoting deliberate processing, we show that it can also influence judgment through emotional processing. The present findings carry implications for international policy, such as UN decisions on environmental issues.

Keywords: risk perception, judgment and decision-making, affect heuristic, bilingualism, foreign language.

**The effect of foreign language on judgments of risk and benefit:
The role of affect**

Lay perceptions of risk and benefit underpin personal decisions, such as whether to take up regular exercising, which influence wellbeing. Lay perceptions of risk and benefit also affect public policy and spending at national level. For instance, the United States Environmental Protection Agency has found that its policies depend more on lay perceptions of risk rather than on expert assessments (Sunstein, 1999, p. 8). Policy making and regulation at an international level, such as by the United Nations, the Organization for Economic Co-operation and Development, or the International Risk Governance Council, frequently involve communication and distribution of official documents in a foreign language, mostly English. Here we ask whether judgments of risk and benefit about a stimulus, such as "nuclear power plant," vary as a function of the language in which the stimulus is described. Merging findings from two distinct areas of psychology, we expect that they will. Research on risk perception suggests that subjective assessments of risk and benefit are influenced by the overall affect, positive or negative, that the verbal description of a stimulus activates (e.g., Slovic, Finucane, Peters, & MacGregor, 2002; see also Zajonc, 1980). Research on bilingualism suggests that reading words in a foreign language activates less affect—predominantly less negative affect—than reading their translation equivalents in the native language (e.g., Caldwell-Harris, 2014; Pavlenko, 2012; Wu & Thierry, 2012).

The Role of Affect in Judgments of Risk and Benefit

Theories on the perception of risk and benefit, and judgment and decision making at large, emphasize a dual process route (e.g., Loewenstein, Weber, Hsee, & Welch, 2001; Slovic, Finucane, Peters, & MacGregor, 2004). One route is emotional and automatic (*risk as feelings*), while the other is analytic and slow (*risk as analysis*).

A prominent theory suggests that the emotional route works prevalently through the *affect heuristic* (e.g., Slovic et al., 2002). According to this view the verbal description of a stimulus automatically triggers mental images and thoughts that are associated with affect, positive or negative (see also Damasio, 1994). Judgments depend on the overall affect that a stimulus activates, especially when judgments are complex and/ or the mental resources of the judge are limited. If the overall affect is positive, this signals safety and the stimulus is judged as high-benefit and low-risk. If it is negative, this signals alarm and the stimulus is judged as low-benefit and high-risk.

In support of the affect heuristic, Alhakami and Slovic (1994) have shown that risk/ benefit judgments are inversely related in people's minds, even if they may be positively associated in the environment. Follow-up research by Finucane and colleagues (Finucane, Alhakami, Slovic, & Johnson, 2000, Study 1) demonstrated that such an inverse relation is strengthened under time pressure, which supports that the underpinning mechanism is fast, emotional processing, rather than slow, analytic processing (see Maule & Svenson, 1993). A second study by Finucane and colleagues (2000, Study 2) demonstrated that information about risks influences judgments about benefits and vice versa, which further supports the idea that risk and benefit judgments are tied together and based on an overall affective evaluation. Inverse relations between judgments of risk and benefit have also been shown in experts' judgments (see Ganzach, 2001, for evidence with financial analysts, Slovic, MacGregor, Malmfors, & Purchase, 1999, for evidence with toxicology experts, and Savadori et al., 2004, for evidence with biotechnology experts). The effect of emotions on risk perception seems pervasive as it is also found in randomly sampled behaviors from everyday life (Hogarth, Portell, Cuxart, & Kolev, 2011). In summary,

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empirical evidence suggests that perceptions of risk and benefit are related to the overall affect that a verbal description of a stimulus activates.

Foreign Language and Affect

Bilingual research suggests that emotional words and phrases have less emotional force when printed in a foreign language as opposed to the native language (e.g., Caldwell-Harris, Tong, Lung, & Poo, 2012; Harris, Gleason, & Ayçiçeği, 2006; for reviews see Caldwell-Harris, 2014; Pavlenko, 2012). For example, Harris and colleagues (Harris et al., 2006) demonstrated that native Turkish speakers who learned English after the age of seven (late Turkish-English bilinguals), respond with lower autonomic arousal to childhood reprimands such as "Shame on you!" when these are presented in their native language (Turkish) than a later learned language (English) (see also Harris, Ayçiçeği, Gleason, 2003). In the same vein, Caldwell-Harris and Ayçiçeği-Dinn (2009) found that late Turkish-English bilinguals report feeling their lies less strongly in a later learned language than in their native language. Neuroimaging studies further specify that foreign language preferentially attenuates the emotional resonance of negative words. For instance, Wu and Thierry (2012) found that while reading a positive or neutral word in a foreign language activates its native language equivalent, a negative word does not. The authors attributed this finding to automatic emotional processes that inhibit access to distressing content. As Wu and Thierry eloquently put it, reading in a foreign language protects your heart.

The Foreign Language Hypothesis for Judgments of Risk and Benefit

We hypothesized that presenting a target stimulus like "pesticides" in a foreign language as opposed to the native language might also protect your heart—its overall affect might become less negative. To the extent that this is true, on the basis of the affect heuristic we predicted that foreign language would prompt higher

judgments of benefit and lower judgments of risk. This prediction rests on the assumption that judgments of risk and benefit in a foreign language would also be based on automatic, emotional processing. However, it could be that the attenuation of emotions that accompanies processing information in a foreign language might instead promote analytical thinking (see Costa, Foucart, Hayakawa, et al., 2014; Keysar, Hayakawa, & An, 2012). That is, a switch from the native language to a foreign language might trigger a switch from emotional to analytic processing. If this happens, we should find weaker (inverse) relations between risk and benefit judgments in a foreign language than in the native language, since such (inverse) relations are underpinned by emotional processes (e.g., Finucane et al., 2000).

In brief, if our foreign language hypothesis is correct, then we should observe a cross-over interaction between language condition and risk/benefit judgments: In relation to the native language, foreign language should prompt higher judgments of benefit and lower judgments of risk. Furthermore, the correlation between risk—benefit judgments should be significant and negative in both language conditions. Instead, if foreign language prompts analytic processing, the negative correlation between risk—benefit judgments should be weaker in the foreign language condition. This alternative hypothesis makes no predictions about the relation between risk and benefit judgments across languages.

Study 1

We examined these hypotheses by presenting participants with 26 activities, substances, technologies, and environmental issues, asking them to rate each one in terms of perceived risk and perceived benefit (we used 21 stimuli from Finucane et al., 2000, Study 1, and introduced 5 novel stimuli; for the full list of items see

Appendix). Half of the participants received the entire questionnaire in a foreign language (English), whereas the other half in their native language (Italian).

Methods

Participants. A sample of 92 Italian students (77 female, 14 male, 1 unknown; M_{age} = 22.91 years, age range: 20–30 years) from the Department of Languages and Literature of the University of Verona voluntarily participated at the beginning of an English lesson.[1] Participants were tested in three different classes. Preliminary analyses revealed no main effect of class, and thus the data were collapsed across this factor. Participants were randomly assigned either to the foreign language condition (n = 46) and received a questionnaire entirely written in English, or to the native language condition (n = 46) and received the same questionnaire in Italian.

All participants were English majors, with a minimum qualification of a First Certificate in English. We wanted to ensure that they would understand the materials. On average, participants in the foreign language condition began English education at age 8.87, 95% CI [8.28, 9.39]. These participants were also asked to self-rate their English proficiency in terms of conversational fluency, reading, writing, and understanding, on a 5-point scale (1 = *almost none*, 2 = *poor*, 3 = *fair*, 4 = *good*, 5 = *very good*). Averaging across the four measures (Cronbach's α = .79), they rated their English skills as *good* (M = 4.14, 95% CI [3.99, 4.29]).

Materials and procedure. Participants were asked to rate 26 specific hazards such as "travelling by airplane," "pesticides," and "nanotechnology," in terms of risk and benefit for *Italian society as a whole* (instructions adapted from Finucane et al., 2000, Study 1). For each item, participants had to rate its risk (benefit) on a 7-point scale (1 = *absolutely not risky* [*beneficial*], 2 = *not risky* [*beneficial*], 3 = *slightly risky*

[*beneficial*], 4 = *moderately risky* [*beneficial*], 5 = *fairly risky* [*beneficial*], 6 = *very risky* [*beneficial*], 7 = *extremely risky* [*beneficial*]). The risk and benefit judgments were presented in separate blocks, and the order of their presentation was counterbalanced within each language condition. Within each block, the 26 target items were presented in a different random order. Following these tasks, participants completed a set of demographic questions. Participants in the foreign language condition additionally responded to questions concerning their English proficiency.

Results

  Judgments of risk and benefit. The main results are illustrated in Figure 1 and support the cross-over interaction predicted by the foreign language hypothesis: In relation to the native language, foreign language triggered lower judgments of risk and higher judgments of benefit.
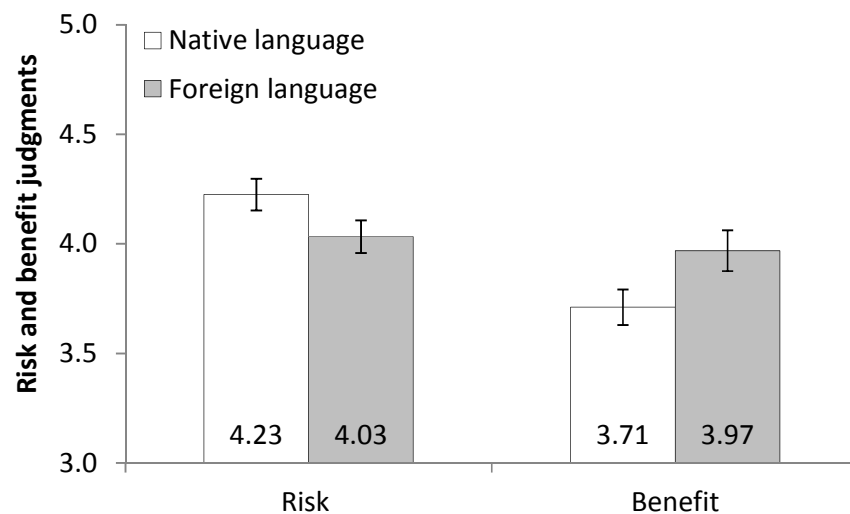

Figure 1. Mean ratings of risk and benefit by language condition (Study 1). Error bars indicate standard error of the means.

We ran two 2 (language condition: foreign language vs. native language) × 2 (type of judgment: risk vs. benefit) analyses of variance, one treating subjects as a random factor (F_1), the other treating items as a random factor (F_2). The ANOVA by subjects revealed no main effect of language condition, $F_1(1, 90) = 0.25$, $p = .616$, $f = 0.03$. There was a main effect of type of judgment, $F_1(1, 90) = 8.44$, $p = .005$, $f = 0.31$. Overall, ratings of risk ($M = 4.13$, 95% CI [4.02, 4.24]) were higher than ratings of benefit ($M = 3.84$, 95% CI [3.71, 3.97]). Importantly, as predicted by the foreign language hypothesis, there was a significant judgment × language interaction, $F_1(1, 90) = 5.14$, $p = .026$, $f = 0.24$. Overall, participants in the foreign language condition (FL) gave marginally lower ratings of risk than participants in the native language condition (NL) ($M_{FL} = 4.03$, 95% CI [3.88, 4.19]; $M_{NL} = 4.23$, 95% CI [4.08, 4.38]), $F(1, 90) = 3.15$, $p = .079$, $d = 0.37$, and significantly higher ratings of benefit ($M_{FL} = 3.97$, 95% CI [3.79, 4.16]; $M_{NL} = 3.71$, 95% CI [3.53, 3.89]), $F(1, 90) = 4.04$, $p = .047$, $d = 0.41$.

The ANOVA by items revealed similar results. There was no main effect of language, $F_2(1, 25) = 0.75$, $p = .396$, $f = 0.17$, but here also no effect of type of judgment, $F_2(1, 25) = 0.32$, $p = .576$, $f = 0.11$. As predicted by the foreign language hypothesis, there was a significant judgment × language interaction, $F_2(1, 25) = 26.23$, $p < .001$, $f = 1.02$. With respect to the native language, items in the foreign language condition received lower ratings of risk ($M_{FL} = 4.04$, 95% CI [3.48, 4.59]; $M_{NL} = 4.23$, 95% CI [3.69, 4.76]), $t(25) = -3.83$, $p = .001$, $d = 0.14$, 95% CI [-0.29, -0.09], and higher ratings of benefit ($M_{FL} = 3.96$, 95% CI [3.40, 4.53]; $M_{NL} = 3.71$, 95% CI [3.16, 4.26]), $t(25) = 3.98$, $p = .001$, $d = 0.19$, 95% CI [0.12, 0.39].[2] In summary, the only robust effect across the analyses by subjects and items was the cross-over interaction.

Risk-benefit correlations. If affective processes underpin judgments of risk and benefit in both language conditions, then we would expect high (negative) risk—benefit correlations. However, if foreign language triggers a switch from emotional to analytic processing, then the risk—benefit correlation should be weaker in the foreign language than in the native language condition. Consistent with the former hypothesis, the correlation between risk and benefit judgments across the 26 items (item means on item means) was high and negative within each language condition, -.91 for the foreign language condition and -.91 for the native language condition. We also computed separate correlations across the 26 items, one for each participant. The mean of these correlations across was -.68 for the foreign language condition (range: -.94 to -.34) and -.72 for the native language condition (range: -.94 to -.12), $t(82) = 1.15$, $p = .252$, $d = 0.24$, 95% CI [-.03, .11]. Importantly, the risk—benefit correlations were negative for *all* participants (see ranges), which provides strong support for the affect heuristic.

In summary, the results of Study 1 are consistent with the proposed foreign language hypothesis. With respect to the native language, foreign language decreased judgments of risk and increased judgments of benefit. Moreover, in both language conditions risk—benefit judgments were strongly and inversely associated, which implies that they were underpinned by emotional processes. The latter finding challenges the alternative hypothesis that foreign language prompts analytical thinking.

Study 2

The foreign language hypothesis rests on the assumption that a stimulus triggers overall less negative affect when described in a foreign language as opposed to the native language (see Wu & Thierry, 2012). The primary aim of Study 2 was to

assess this assumption directly by gathering measures of affect. In the case it did, a more specific aim was to determine whether the foreign language effect on judgments of risk and benefit is mediated by affect. We presented a new sample of participants with the 26 items of Study 1 and asked them for judgments of risk and benefit, either in their native language (Italian) or a foreign language (English). We additionally asked participants to rate each item in terms of positive and negative feelings. We expected that the overall affect ratings would be less negative in the foreign language than in the native language condition, and that this difference would mediate the effect of foreign language on risk and benefit judgments.

Methods

Participants. A total of 123 adults (60 female, 63 male; M_{age} = 25.33 years, age range: 19 – 43 years) were recruited by e-mail distribution lists of the University of Trento and voluntarily took part in the online survey.[3] Of those, 59 were randomly assigned to the foreign language condition (English) and 64 to the native language condition (Italian). Three participants assigned in the foreign language condition self-rated their English skills as very poor, and thus were excluded from subsequent analyses (including these participants does not alter the pattern of the findings). We report results from the remaining 120 participants. All participants in the foreign language condition had a First Certificate in English. On average, they began English education at age 10.95, 95% CI [10.05, 11.90]. Averaging across conversational fluency, reading, writing, and understanding (Cronbach's α = .84), participants in the foreign language condition rated their English skills as *good* (M = 4.00, 95% CI [3.86, 4.15]).

Materials and procedure. The materials for the risk and benefit judgment tasks were similar to those of Study 1. Participants were presented with the same 26

items and assessed each one in terms of risk and benefit on the same 7-point scale (1

= *absolutely not risky* [*beneficial*], 7 = *extremely risky* [*beneficial*]). However, in

Study 2 participants in the foreign language condition were also offered the option, "I

don't understand this item," to ensure that eventual findings are not due to a lack of

understanding. The questions about risk and benefit were presented in separate

blocks, and the questions within each block were presented in a different random

order. In addition, as a third block, participants were asked to rate their *positive* and

negative feelings (in that order) towards the 26 items. For example, participants read:

"Thinking about nuclear power plants, I have…" followed by "positive feelings" and

then "negative feelings." Participants had to rate each type of feeling on a 5-point

scale (1 = *not at all*, 2 = *a little*, 3 = *moderately*, 4 = *quite a bit*, 5 = *extremely*; from

Watson, Clark, & Tellegen, 1988).

Within each language condition participants received these three tasks in one

of four counterbalancing orders (risk judgments followed by benefit judgments and

emotion ratings, benefit judgments followed by risk judgments and emotion ratings,

emotion ratings followed by risk and benefit judgments, emotion ratings followed by

benefit and risk judgments). Finally, participants responded to a set of demographic

questions. Those in the foreign language condition additionally responded to

questions about their foreign language proficiency.

Results

Judgments of risk and benefit. The main findings are illustrated in Figure 2

and show the cross-over interaction predicted by the foreign language hypothesis.

Replicating the findings of Study 1, with respect to the native language, foreign

language triggered lower judgments of risk and higher judgments of benefit. As in

Study 1, we ran two 2 (language) × 2 (type of judgment) ANOVAs, one by subjects

(F_1) and another by items (F_2). The analysis by subjects revealed no main effect of language, $F_1(1, 118) = 0.24$, $p = .628$, $f = 0.05$, or type of judgment, $F_1(1, 118) = 0.13$, $p = .718$, $f = 0.08$. However, as predicted, there was a significant judgment × language interaction, $F_1(1, 118) = 7.56$, $p = .007$, $f = 0.25$. Participants in the foreign language condition gave lower ratings of risk than those in the native language condition ($M_{FL} = 3.96$, 95% CI [3.81, 4.12]; $M_{NL} = 4.22$, 95% CI [4.09, 4.35]), $F(1, 119) = 6.56$, $p = .012$, and marginally higher ratings of benefit ($M_{FL} = 4.16$, 95% CI [3.98, 4.33]; $M_{NL} = 3.97$, 95% CI [3.84, 4.10]), $F(1, 119) = 3.13$, $p = .08$.
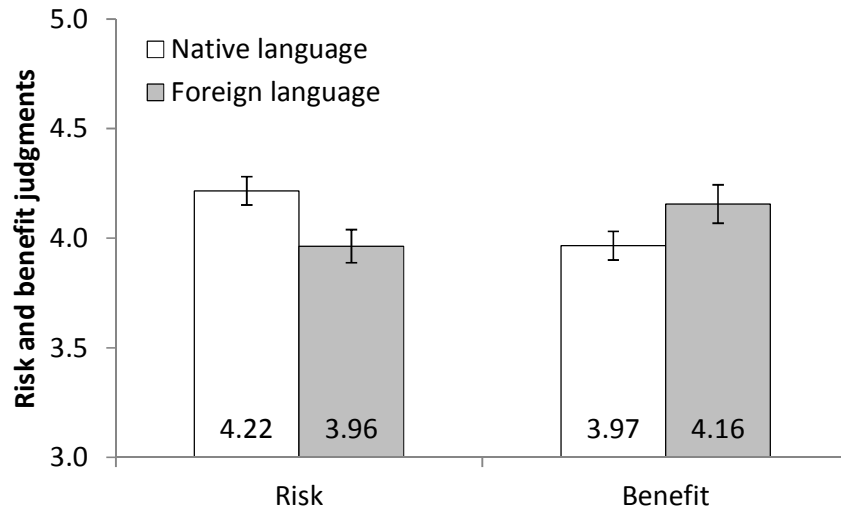
Figure 2. Mean ratings for risk and benefit judgments by language condition (Study 2). Error bars represent standard error of the mean.

The results from the items analysis were similar. There was no main effect of language, $F_2(1, 25) = 1.27$, $p = .271$, $f = 0.22$, or type of judgment, $F_2(1, 25) = 0.01$, $p = .929$, $f = 0.00$, but a significant judgment × language interaction, $F_2(1, 25) = 25.62$, $p < .001$, $f = 1.01$. Overall, with respect to the native language, in the foreign language

items received lower ratings of risk (M_{FL} = 3.97, 95% CI [3.51, 4.46]; M_{NL} = 4.22, 95% CI [3.79, 4.71]), t(25) = -4.69, p < .001, d = -0.20, 95% CI [-0.36, -0.14], and higher ratings of benefit (M_{FL} = 4.13, 95% CI [3.62, 4.62]; M_{NL} = 3.97, 95% CI [3.45, 4.45]), t(25) = 3.07, p = .005, d = 0.12, 95% CI [0.06, 0.28].[4]

Risk-benefit correlations. Based on the foreign language hypothesis and the results of Study 1, we expected high negative correlations between risk and benefit judgments in both language conditions. This is what we found. The correlation between risk and benefit judgments across the 26 items (item means on item means) was -.89 in the foreign language condition and -.91 in the native language condition. We also computed separate correlations across the 26 items, one for each participant. The mean of these correlations was -.63 (range: -.94 to -.11) in the foreign language condition, and -.68 (range: -.96 to -.08) in the native language condition, t(118) = -1.59, p = .115, d = -0.28, 95% CI [-.12, .01]. As in Study 1, the correlation between risk and benefit judgments was negative for *all* participants, which supports the affect heuristic.

Positive and negative feelings. Our foreign language hypothesis rests on the assumption that a stimulus triggers less negative overall affect when described in a foreign language than in the native language. The main results are illustrated in Figure 3 and are broadly consistent with this prediction. They point to a cross-over interaction: mean negative feelings were lower in the foreign language than in the native language condition, while the reverse was true for positive feelings. We analyzed the data with a two 2 (language) × 2 (type of feelings) ANOVAs, one by subjects (F_1) and another by items (F_2). The analysis by subjects revealed a marginal effect of language condition, F_1(1, 118) = 3.19, p = .077, f = 0.16. Participants in the foreign language condition gave slightly higher ratings (M_{FL} = 2.78, 95% CI [2.69,

2.87]) than those in the native language condition ($M_{NL} = 2.67$, 95% CI [2.58, 2.75]).

There was also a significant main effect of type of feelings, $F_1(1, 118) = 9.04$, $p =$ .003, $f = 0.28$. Overall, participants rated the items as evoking more positive feelings

($M = 2.79$, 95% CI [2.72, 2.87]) than negative feelings ($M = 2.65$, 95% CI [2.57,

2.73]). Importantly, there was a significant feeling × language interaction, $F_1(1, 118)$

$= 27.96$, $p < .001$, $f = 0.49$. Overall, participants in the foreign language condition

gave significantly higher ratings of positive feelings than participants in the native

language condition ($M_{FL} = 2.97$, 95% CI [2.85, 3.10]; $M_{NL} = 2.61$, 95% CI [2.52,

2.71]), $F(1, 118) = 22.33$, $p < .001$, $f = 0.43$, and slightly lower ratings of negative

feelings ($M_{FL} = 2.59$, 95% CI [2.48, 2.70]; $M_{NL} = 2.72$, 95% CI [2.60, 2.84]), $F(1,$
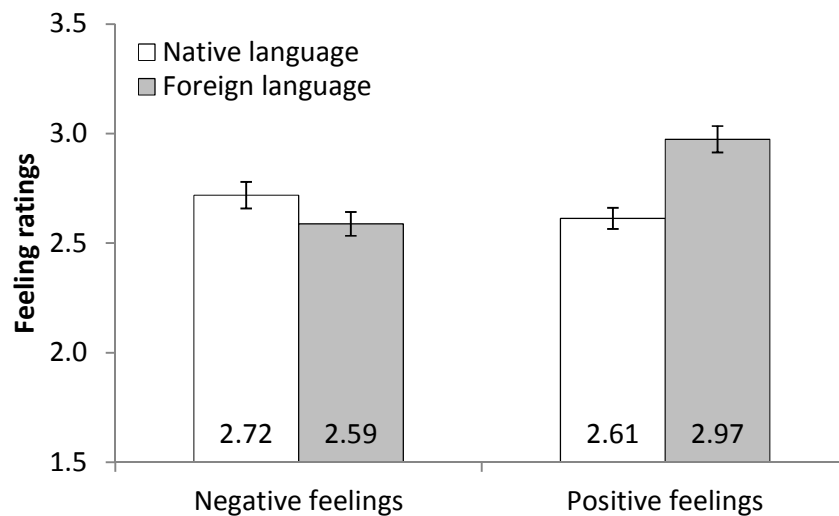
$118) = 2.54$, $p = .113$, $f = 0.15$.

Figure 3. Mean ratings of negative and positive feelings by language condition (Study

2). Error bars represent standard error of the mean.

The item analysis yielded similar results. There was a significant main effect of language condition. Overall, items received higher ratings when described in the foreign language (M_{FL} = 2.78, 95% CI [2.72, 2.84]) than in the native language (M_{NL} = 2.67, 95% CI [2.60, 2.73]), $F_2(1, 25)$ = 24.27, $p < .001$, $f = 0.99$. In this analysis there was no main effect of type of feelings, $F_2(1, 25)$ = 0.19, $p = .670$, $f = 0.08$. Importantly, there was a significant feeling × language interaction, $F_2(1, 25)$ = 32.58, $p < .001$, $f = 1.14$. Overall, with respect to the native tongue, in the foreign language items received higher ratings of positive feelings (M_{FL} = 2.98, 95% CI [2.59, 3.36]; M_{NL} = 2.61, 95% CI [2.28, 2.95]), $t(25)$ = 7.39, $p < .001$, $d = 0.41$, 95% CI [0.26, 0.46]), and significantly lower ratings of negative feelings (M_{FL} = 2.59, 95% CI [2.25, 2.93]; M_{NL} = 2.72, 95% CI [2.41, 3.03]), $t(25)$ = -2.67, $p = .013$, $d = -0.16$, 95% CI [-0.23, -0.03].

In summary, consistent with the foreign language hypothesis, the target stimuli were rated overall less negatively when described in the foreign language than in the native language. However, this effect was not driven by the mechanisms suggested by bilingual research, that is, an attenuation of negative feelings (this attenuation was significant only in the analysis by items). Instead, it was mostly driven by an amplification of positive feelings. We discuss reasons for this apparent inconsistency in the General Discussion.

Correlations between judgments-feelings. On the basis of our foreign language hypothesis we expected highly positive correlations between risk judgments—negative feelings and benefit judgments—positive feelings, and highly negative correlations between risk judgments—positive feelings and benefit judgments—negative feelings. This is what we found. The correlation between risk judgments—negative feelings (item means on item means) in the foreign language

and the native language conditions were respectively, .95 ($p < .001$) and .92 ($p <$ .001). The correlation between risk judgments—positive feelings in the foreign language and the native language conditions were respectively, -.87 ($p < .001$) and -.88 ($p < .001$). The corresponding correlations between benefit judgments—positive feelings were, .92 ($p < .001$) and .93 ($p < .001$). Finally, the corresponding correlations between benefit judgments—negative feelings were, -.93 ($p < .001$) and -.92 ($p < .001$).

We also computed separate correlations across the 26 items, one for each participant. The mean correlation across participants between risk judgments—negative feelings in the foreign language and the native language conditions were respectively, .67 (range: .21 to .94) and .63 (range: -.21 to .92). The mean correlations between risk judgments—positive feelings in the foreign language and the native language conditions were respectively, -.60 (range: -.92 to -.25) and -.58 (range: -.94 to .16). The corresponding mean correlations between benefit judgments—negative feelings were -.65 (range: -.95 to .11) and -.61 (range: -.93 to .22). Finally, the corresponding mean correlations between benefit judgments—positive feelings were .69 (range: .14 to .92) and .67 (range: -.37 to .95).

Multiple mediation analysis. To test the hypothesis that affect mediates the foreign language effect in risk and benefit judgments, we ran two multiple mediation analyses using the INDIRECT macro by Preacher and Hayes (2008), one for judgments of risk and another for judgments of benefit. In both, the predictor was language (foreign language = 1, native language = 0), and the mediators were positive/ negative feelings (5-point scales, with higher ratings indicating more positive/ negative feelings). We used a bootstrapping procedure based on 5000 bootstrapped re-samples.

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Risk judgments. The main findings are illustrated in Figure 4. As predicted, taken together, positive and negative feelings mediated the effect of language on risk judgment. The total and indirect effects of language on risk judgment were respectively, -0.25 (p = .012) and -0.06 (p = .557). The total indirect effect through the mediators (positive and negative feelings) had a point estimate of -0.19 and a 95% BCa bootstrap CI of -0.34 to -0.06. As Figure 4 illustrates, foreign language was associated with increased positive feelings and decreased negative feelings, which in turn were related with lower ratings of risk. An examination of the specific indirect effects indicates that only positive feelings was a significant mediator, since its 95% CI does not contain zero, -0.29 to -0.03.
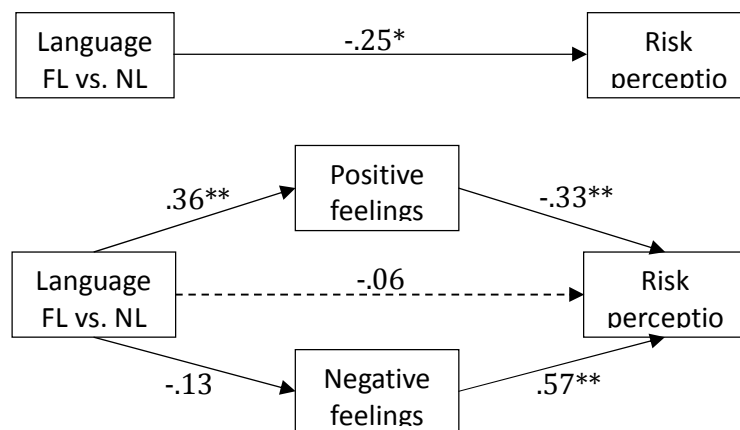

Figure 4. Mediation model illustrating the association between language (FL = foreign language, NL = native language) and risk perception as mediated by positive and negative feelings. *p < .05, **p < .01

Benefit judgments. The main findings are illustrated in Figure 5. As was the case with risk judgments, together positive and negative feelings mediated the effect

of language on benefit judgments. The total and indirect effects of language on benefit judgment were respectively, 0.19 (p = .079) and -0.11 (p = .295). The total indirect effect had a point estimate of 0.30 and a 95% BCa bootstrap CI of 0.18 to 0.48. Figure 5 illustrates that foreign language is associated with greater positive feelings and lower negative feelings, which in turn are related to higher judgments of benefit. An examination of the specific indirect effects indicates that only positive feelings was a significant mediator, since its 95% CI does not contain zero, 0.14 to 0.43.

In summary, Study 2 replicated the main findings of Study 1 and provided direct evidence that foreign language influences risk and benefit judgment through emotions. With respect to the native language, foreign language attenuated negative emotions and amplified positive emotions, and this net increase in positive affect mediated the foreign language effect in judgments of risk and benefit.
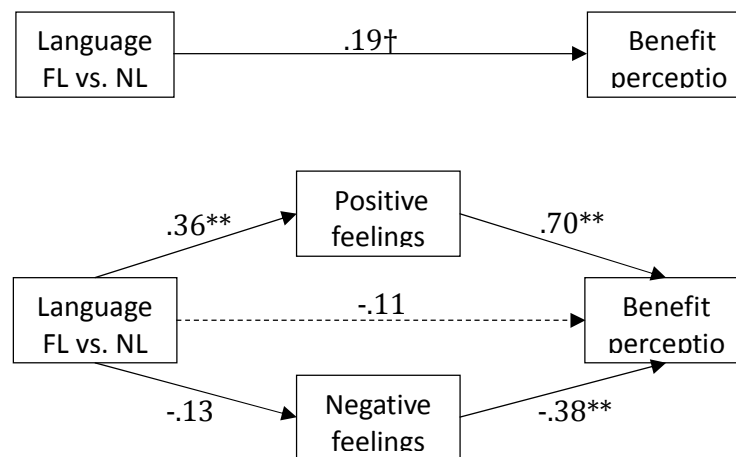

Figure 5. Mediation model illustrating the association between language (FL = foreign language, NL = native language) and benefit judgment as mediated by positive and negative feelings. †p < .08, **p < .01.

Discussion

The language in which a stimulus is described influences its judged risk and benefit. Describing a stimulus in a foreign language, as opposed to the native language, decreased judgments of risk and increased judgments of benefit. Furthermore, in both language conditions judgments of risk and benefit were underpinned by emotional processing. This is implicitly supported by the finding that judgments of risk/ benefit were inversely associated (Study 1, 2) and directly supported by the finding that each type of judgment was highly associated with ratings of negative/ positive feelings in the expected manner (Study 2). Importantly, the effect of foreign language on judgments of risk and benefit was mediated by affect and specifically by a net increase in positive feelings (Study 2). The present hypothesis is novel and was predicted by merging evidence on the affect heuristic with evidence from bilingual studies: Target stimuli elicit overall less negative affect when printed in a foreign language as opposed to the native language, which leads to comparatively lower risk and higher benefit judgments.

We also considered an alternative hypothesis: foreign language prompts analytical thinking. This hypothesis predicts that foreign language would lead to weaker associations between risk—benefit judgments as well as weaker associations between such judgments and feelings. But all such associations were similarly strong across the language conditions. This alternative hypothesis has been proposed to account for evidence showing that foreign language reduces several decision biases (see Costa, Foucart, Arnon, et al., 2014; Costa, Foucart, Hayakawa, et al., 2014; Keysar et al., 2012). Specifically, foreign language reduced framing effects (participants were less swayed by whether outcomes were described in terms of gains or losses), and increased risky choice (participants selected more often risky options

over safer options in a context where risky options had a higher expected value). Moreover, foreign language promoted utilitarian moral choices (participants accepted more often actions that involved sacrificing one person to save five), which has been linked to a controlled mode of thinking (e.g., see Greene, Morelli, Lowenberg, Nystrom, & Cohen, 2008). In respect to existing literature, a novelty of the present research is that it shows that foreign language can influence judgment through emotional processing.

Curiously, all types of judgment that foreign language has been shown to influence (framing effects, risky choice, moral judgment) are associated with the *negativity bias*: a tendency in humans and animals to weigh negative events more than positive events (for excellent reviews see Rozin & Royzman, 2001, and Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001). Consider people's tendency to prefer safe bets with lower expected values over riskier bets with higher expected values. This tendency can be explained in terms of overweighting negative outcomes (e.g., maximum loss) with respect to positive outcomes (e.g., maximum win). A similar explanation can be offered for people's reluctance to sacrifice one person (negative outcome) to save five other persons (positive outcome). Could it be that foreign language reduces the negativity bias or, equivalently, triggers a positivity bias? The present findings support this hypothesis by showing that foreign language increases overall positive feelings. Furthermore, Wu and Thierry (2012) provide a possible mechanism that does not implicate controlled processes: foreign language activates automatic processes which suppress access to distressing emotional content. Future studies could address the proposed link between foreign language and negativity bias by investigating, for instance, whether foreign language diminishes other instances of

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this bias such as magical thinking (e.g., people's reluctance to eat fudge cake that looks like feces, see Rozin, Millman, & Nemeroff, 1986).

A surprising finding in our studies was that foreign language increased positive feelings. This runs counter to bilingual research, which suggests that foreign language either diminishes positive feelings or leaves them unaltered (for a review see Pavlenko, 2012). For instance, Dewaele (2008) using introspective reports found that the phrase "I love you" is felt more intensely in the native language than in a foreign language. The cause of this inconsistency might be traced to the different stimuli used. Most bilingual studies used stimuli that are either *all-positive* (e.g. "love") or *all-negative* (e.g. "death.") We purposefully used complex stimuli (e.g. "travelling by airplane") that have both negative associations (e.g. accidents) and positive associations (e.g. holidays.) (Interestingly, the negativity bias is strong precisely for such complex stimuli, see Rozin & Royzman, 2001). Now just as judgments of risk/ benefit tap on the overall affect that a stimulus triggers, subjective ratings of positive/ negative feelings might also do. Concretely, when a person judges positive feelings she might take into consideration not only the positive associations but also the negative associations that the stimulus activates.[5] In this view, the results from the positive/ negative scales should be taken only as a general indication that foreign language sways the balance of feelings toward the positive side.

But why was the increase in positive feelings higher than the decrease in negative feelings? Recent research has shown that when the endpoints of emotional scales are described in a foreign language, as opposed to the native language, they support more extreme ratings (de Langhe, Puntoni, Fernandes & van Osselaer, 2011). The idea is that the anchors of emotional scales (e.g. "extremely happy") are less intensely experienced when they are described in a foreign language (see, e.g.,

Pavlenko, 2012). Because of that, judges compensate by selecting higher ratings. In relation to the present studies, such a tendency would promote higher ratings in the foreign language condition for both negative and positive feelings. In the case of negative feelings this tendency works against our hypothesis (we predict a decrease in negative feelings). Thus the observed decrease in negative feelings might have been an underestimation, whereas the increase in the positive feelings an overestimation. Future research could circumvent this problem by representing emotional states via pictograms which are less susceptible to such tendencies (see de Lange et al., 2011, Study 8), or by using other measures like electrodermal responses or facial affect.

A possible limitation of the present studies concerns the languages used. Based on anecdotal evidence, it is likely that the foreign language (English) was perceived as less emotional than the native language (Italian) (see Puntoni, de Langhe, & van Osselaer, 2009). Differences in language emotionality should pull both positive and negative feelings toward the same direction. However, foreign language *increased* ratings for positive feelings and *decreased* ratings for negative feelings (at least in the analysis by items). In general, we do not believe that the present findings are language specific. Bilingual research has registered systematic differences between a later learned language and the native language, using a wide array of language combinations, as well as balanced designs (for a review, see Pavlenko, 2012). The effects of foreign language on judgment and decision making have similarly proven robust with respect to the languages and even the cultures used (e.g., Costa, Foucart, Arnon, et al., 2014; Costa, Foucart, Hayakawa, et al. 2014; Keysar et al., 2012; Puntoni et al., 2009).

In conclusion, we have shown that hazards printed in a foreign language rather than in the native language are perceived as less risky and more beneficial.

Communicating in a foreign language is a commonplace activity in international

organizations, such as UN, NATO, and EEC, and multinational companies. Such

organizations make decisions pertaining to managing and communicating risk, which

have global-reaching consequences. Consider UN agreements on climate change,

such as the Kyoto Protocol, or NATO decisions on how to tackle perceived threats.

Can foreign language also influence such decisions? It might, since experts'

judgments of risk also rely on feelings (e.g., Slovic et al., 1999; Sunstein, 1999).

Communication in a foreign language might promote a less negative affective

impression of a hazard and hence decrease impetus toward corrective measures.

Footnotes

[1]To estimate the appropriate sample size, we ran an a-priori sample size calculation using the software package *G*power* (Faul, Erdfelder, Lang, & Buchner, 2007). We used the following settings: statistical power = .80, effect size f = .25 (medium effect) p = .05 (traditional criterion of statistical significance), number of groups = 2 (foreign language, native language), number of measurements = 2 (risk, benefit), correlation between repeated measures $\rho = -0.4$ (estimated). The total sample size suitable to detect effects of a within by between participants factors interaction under these conditions would be 90.

[2]For risk judgments 19 out of 26 items showed the expected pattern of means ($M_{FL} < M_{NL}$), while for benefit judgments 20 out of 26 items showed the expected pattern of means ($M_{FL} > M_{NL}$) (see Appendix, Table 1). In each case the percentage of hits is higher than what would be expected by chance (for both $p < .05$, by binomial test).

[3]We ran an a-priori sample size calculation using the software package *G*power* (Faul et al., 2007). We used the following settings: statistical power = .80, effect size f = .24 (medium effect, based on Study 1), p = .05 (traditional criterion of statistical significance), number of groups = 2 (foreign language, native language), number of measurements = 2 (risk, benefit), correlation between repeated measures $\rho = -0.7$ (based on Study 1). The total sample size suitable to detect effects of a within by between participants factors interaction under these conditions is 118.

[4]For risk judgments 20 out of 26 items showed the expected pattern of means ($M_{FL} < M_{NL}$), while for benefit judgments 18 out of 26 items showed the expected pattern of means ($M_{FL} > M_{NL}$) (see Appendix, Table 2). In each case the

percentage of hits is higher than what would be expected by chance (for both $p <$ .05, by binomial test).

[5]This is supported by the extremely high negative correlations between negative and positive feelings (foreign language: $r = -.95$; native language: $r = -.92$, item means on item means).

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Appendix

Table 1

Mean Ratings of Risk and Benefit Judgments for Each Item by Language Condition in Study 1. Pairs of Means that are Consistent With our Hypothesis are Highlighted in Boldface.

ITEMS		RISK		BENEFIT	
English	Italian	Foreign L. *M* (*SD*)	Native L. *M* (*SD*)	Foreign L. *M* (*SD*)	Native L. *M* (*SD*)
Food preservatives	Conservanti alimentari	**3.57 (1.29)**	**3.78 (0.96)**	**3.72 (1.38)**	**2.83 (1.16)**
Cars	Automobili	**4.43 (0.98)**	**4.67 (1.06)**	**4.85 (1.41)**	**3.96 (1.61)**
Incinerators	Inceneritori	5.09 (1.29)	5.09 (1.13)	**3.20 (1.52)**	**2.93 (1.45)**
Alcoholic beverages	Bevande alcoliche	**5.17 (1.22)**	**5.26 (1.14)**	**2.59 (1.28)**	**2.24 (0.95)**
Industrial production plants	Impianti di produzione industriale	**4.71 (1.25)**	**5.59 (1.07)**	**3.11 (1.56)**	**2.80 (1.41)**
Eating beef	Mangiare carne di manzo	**2.72 (1.22)**	**3.04 (1.33)**	**4.39 (1.44)**	**4.13 (1.31)**
Cigarettes	Sigarette	6.26 (0.95)	6.13 (1.00)	**1.46 (0.91)**	**1.27 (0.58)**
Pesticides	Pesticidi	**5.41 (1.20)**	**5.52 (1.26)**	**2.83 (1.24)**	**2.39 (1.04)**
Explosives	Esplosivi	**6.17 (1.08)**	**6.37 (0.77)**	**1.91 (1.11)**	**1.87 (0.83)**
Cellular phones	Telefoni cellulari	**4.22 (1.50)**	**4.35 (1.10)**	**4.96 (1.53)**	**4.50 (1.41)**
Roller blades	Pattini in linea	**2.42 (1.01)**	**2.93 (1.37)**	3.93 (1.34)	4.17 (1.25)
Nuclear power plants	Impianti nucleari	**5.76 (1.06)**	**6.35(0.90)**	2.56 (1.46)	2.70 (1.65)
Food irradiation	Irradiazione di alimenti	5.69 (1.38)	5.66 (1.28)	**2.51 (1.47)**	**2.23 (1.29)**
Traveling by airplane	Viaggiare in aereo	**3.30 (1.28)**	**3.50 (0.91)**	**5.22 (1.43)**	**4.89 (1.34)**
Windsurfing	Fare windsurf	**3.15 (1.12)**	**3.28 (1.13)**	4.54 (1.44)	4.78 (1.17)
Swimming pools	Piscine	**2.33 (0.94)**	**2.67 (0.97)**	**5.74 (1.20)**	**5.43 (1.09)**
Solar energy	Energia solare	**1.70 (0.92)**	**2.09 (1.03)**	**6.41 (0.88)**	**6.11 (0.88)**
Railroads	Ferrovie	3.17 (1.18)	2.96 (0.92)	5.11 (1.42)	5.20 (1.11)
Motorcycles	Motociclette	**4.41 (1.20)**	**4.63 (1.16)**	**3.83 (1.24)**	**3.54 (1.15)**
Chemical fertilizers	Fertilizzanti chimici	**4.93 (1.18)**	**5.24 (1.15)**	**2.93 (1.20)**	**2.43 (0.91)**
Nanotechnology	Nanotecnologie	**2.62 (1.42)**	**2.98 (1.14)**	**5.40 (1.39)**	**4.59 (1.41)**
Microwave ovens	Forni a microonde	3.74 (1.34)	3.50 (1.07)	**3.89 (1.61)**	**3.87 (1.20)**
Bicycles	Biciclette	**2.20 (0.86)**	**2.54 (1.24)**	6.02 (1.27)	6.09 (0.84)
Biotechnology	Biotecnologie	**2.46 (1.22)**	**2.67 (0.99)**	**5.72 (1.17)**	**5.04 (1.21)**
Climate change	Cambiamento climatico	5.61 (1.54)	5.46 (1.26)	1.87 (1.22)	2.11 (1.04)
Natural gas	Gas naturali	3.65 (1.65)	3.61 (1.15)	**4.37 (1.58)**	**4.29 (1.36)**

Table 2

Mean Ratings of Risk and Benefit Judgments for Each Item by Language Condition in Study 2. Pairs of Means that are Consistent With our Hypothesis are Highlighted in Boldface.

ITEMS English	Italian	RISK		BENEFIT	
		Foreign L. M (SD)	Native L. M (SD)	Foreign L. M (SD)	Native L. M (SD)
Food preservatives	Conservanti alimentari	**3.73 (1.36)**	**4.06 (1.13)**	**3.98 (1.69)**	**3.23 (1.27)**
Cars	Automobili	4.66 (1.08)	4.47 (0.91)	4.71 (1.50)	4.86 (1.48)
Incinerators	Inceneritori	4.93 (1.27)	4.92 (1.38)	3.49 (1.51)	3.38 (1.60)
Alcoholic beverages	Bevande alcoliche	4.84 (1.29)	4.78 (1.03)	2.80 (1.31)	2.89 (1.21)
Industrial production plants	Impianti di produzione industriale	**4.74 (1.32)**	**5.37 (1.13)**	**3.49 (1.67)**	**3.22 (1.41)**
Eating beef	Mangiare carne di manzo	**2.94 (1.22)**	**3.25 (1.27)**	3.94 (1.31)	4.14 (1.46)
Cigarettes	Sigarette	**5.77 (1.22)**	**6.06 (0.91)**	1.52 (0.71)	1.61 (0.90)
Pesticides	Pesticidi	**5.43 (1.14)**	**5.61 (1.06)**	**3.18 (1.43)**	**2.61 (1.29)**
Explosives	Esplosivi	6.04 (1.18)	5.75 (1.37)	**2.78 (1.50)**	**2.67 (1.36)**
Cellular phones	Telefoni cellulari	**3.73 (1.23)**	**4.55 (1.17)**	**4.75 (1.31)**	**4.59 (1.55)**
Roller blades	Pattini in linea	**2.54 (0.93)**	**2.92 (1.21)**	**4.94 (1.34)**	**4.45 (1.72)**
Nuclear power plants	Impianti nucleari	**5.57 (1.25)**	**5.94 (1.27)**	**2.94 (1.86)**	**2.59 (1.49)**
Food irradiation	Irradiazione di alimenti	**5.09 (1.0)**	**5.88 (1.09)**	**2.49 (1.39)**	**2.23 (1.14)**
Traveling by airplane	Viaggiare in aereo	**3.05 (0.96)**	**3.44 (1.14)**	**5.32 (1.56)**	**5.14 (1.40)**
Windsurfing	Fare windsurf	**2.67 (1.07)**	**3.16 (1.18)**	**5.07 (1.44)**	**4.95 (1.47)**
Swimming pools	Piscine	**2.36 (0.91)**	**2.61 (0.97)**	**5.44 (0.95)**	**5.37 (1.18)**
Solar energy	Energia solare	**2.05 (0.94)**	**2.13 (1.25)**	6.25 (1.01)	6.41 (0.81)
Railroads	Ferrovie	**2.93 (1.16)**	**3.02 (1.09)**	**5.70 (1.21)**	**5.41 (1.24)**
Motorcycles	Motociclette	**4.75 (1.25)**	**5.02 (1.22)**	**4.00 (1.36)**	**3.94 (1.10)**
Chemical fertilizers	Fertilizzanti chimici	**4.82 (1.22)**	**5.16 (1.13)**	**3.29 (1.42)**	**2.72 (1.27)**
Nanotechnology	Nanotecnologie	**2.59 (1.14)**	**2.84 (1.14)**	**5.56 (1.25)**	**5.03 (1.26)**
Microwave ovens	Forni a microonde	**3.63 (1.34)**	**4.05 (1.35)**	3.38 (1.34)	3.81 (1.34)
Bicycles	Biciclette	**2.55 (1.09)**	**2.75 (1.36)**	**6.22 (0.94)**	**6.16 (1.10)**
Biotechnology	Biotecnologie	2.73 (1.17)	2.69 (1.17)	**5.73 (1.20)**	**5.23 (1.18)**
Climate change	Cambiamento climatico	**5.34 (1.39)**	**5.55 (1.25)**	2.00 (1.04)	2.03 (1.20)
Natural gas	Gas naturali	3.73 (1.24)	3.67 (1.30)	**4.52 (1.44)**	**4.42 (1.41)**

Chapter 6

General Discussion

In this essay I explored whether the use of a foreign language as compared to the native language influences moral evaluation and risk perception. I found that it influences both types of judgments. In terms of moral judgments, the use of a foreign language increased consequentialist type judgments in the trolley dilemmas (Chapter 2), decreased wrongness judgments towards relatively harmless but offensive moral transgressions (Chapters 3 and 4), and increased moral goodness judgments for positive actions (Chapter 4). Importantly, the use of a foreign language also promoted leniency towards potentially harmful everyday norm violations (Chapters 3 and 4). In terms of risk and benefit perception, the use of a foreign language increased benefit judgments and decreased risk judgments (Chapter 5).

The present essay also examined the psychological processes that underpin the foreign language effect in each of these domains. The findings suggest that foreign language exerts its influence through intuitive processes. In moral judgment, foreign language influenced judgments by suppressing the activation of sociocultural and moral norms, whereas in risk and benefit perception it exerted an influence through affect. Below I will present a detailed account for *why* foreign language suppresses norms and attenuates emotions. But first I will discount an alternative proposal which holds that foreign language effects result from the selective activation of controlled processing.

Costa and colleagues (Costa et al., 2015) examined the trolley dilemmas and found that foreign language increased the rate of consequentialist type judgments. Their findings mirror those presented in Chapter 2. Following Greene and colleagues' dual process model of moral judgment (e.g., Greene et al., 2001, 2008), Costa and

colleagues (2014) explained their findings by suggesting that the use of a foreign language attenuates emotional responses and increases controlled processing. If their hypothesis is correct then we should also expect improved performance in logical tasks that typically trigger an intuitive, incorrect response. In Chapter 3 and 4 my coauthors and I tested one such task, the Moses illusion (e.g., Erickson & Mattson, 1981). We found that the use of a foreign language failed to improve performance. Furthermore, if Costa and colleagues' (Costa et al., 2014) hypothesis were correct, then the use of a foreign language should decrease moral dumfounding, which stands for the inability to justify one's moral judgment (e.g., Haidt, 2001). The idea is that if participants had arrived at a moral evaluation through deliberation, then they should be aware of the contents of their thoughts (e.g., Sloman, 1996). But we found just the opposite—the use of a foreign language increased moral dumbfounding. Still, one could argue that this just proves that the participants in the foreign language condition were "lazy" and decided not to provide reasons. But even if we focus on participants that provided justifications, their justifications were predominantly deontological with no differences between the language conditions. This result is not consistent with the controlled processing hypothesis, which predicts a higher rate of consequentialist type justifications in the foreign than in the native language.

In terms of risk perception, once again, the results speak against the hypothesis that using a foreign language increases controlled thinking. As examined and discussed in Chapter 5, my coauthors and I found that the effect of foreign language on risk and benefit perception was mediated by affect. In each language condition the correlations among positive/negative feelings and risk/benefit ratings (item means on item means) were extremely high (in absolute values the correlations were higher than .90). These results are instead congruent with the hypothesis that judgments of risk

and benefit were underpinned by the affect heuristic. That is, they were underpinned by intuitive rather than controlled processing.

Why did foreign language influence risk and benefit judgments and moral judgments via different routes? Why foreign language did not influence moral judgments through affect? One possibility is that emotions do play a role in the foreign language effect on moral judgment but we were unable to detect this for methodological reasons. Specifically, in these studies we measured emotions with scales, which were not supplemented with graphic icons. Because of this, the results were susceptible to the anchor contraction effect, which refers to the tendency to assign more extreme values when the anchors of a scale are labeled in a foreign language than in the native language (see de Langhe, Puntoni, Fernandes, & van Osselaer, 2011). Notice that this tendency goes in the opposite direction to the predicted effect, that is, a decrease in moral wrongness judgments. Future studies could address this by using emoticon scales of affective valence or more direct measures of affect such as facial expressions.

A further possibility why emotions did not exert an influence in moral judgment is that moral judgments are more complex than the risk and benefit judgments we tested. For example, moral judgments involve a consideration of the intentions of an agent (for a review, see Young & Tsoi, 2013). Furthermore, moral judgments involve two types of affect: affect associated directly to an action (e.g., pushing a person) and affect associated to the outcomes (e.g., saving five people; see Cushman, 2013). For example, it could be that the foreign language effect on moral judgment is underpinned by action-based affect. Future studies could address this hypothesis by asking specific questions about action-based affect (How do you feel

about pushing the stranger off the bridge?), rather than generic questions like the ones we used in the present studies (e.g., How did the scenario made you feel?)

<div align="center">**Roots of the foreign language effect**</div>

Throughout this essay I made the claim that the use of a foreign language influences judgment and decision-making through intuitive processes. Below I present two ways of how this could happen. First, I discuss the *language-dependent memory* account. Second, I discuss the *depleted cognitive recourses* account. But before I unpack these two accounts, I want to explain what I mean by intuition. By intuition I refer to associative memory. This involves ideas and connections between ideas (see Kahneman, 2011). Ideas are construed broadly and include words such as nouns, or adjectives, but also concepts of words, emotions and facial expressions. Consider, for example, the words *Christmas tree*. It will automatically activate some images and memories, which in turn will activate others. These images and memories (e.g. family) might also trigger associated feelings (e.g., warmth). But why should the use of a foreign language influence intuitive processing?

Language-dependent memory

One answer comes from studies on bilingualism and autobiographical memory (e.g., Schrauf & Rubin, 2001, 2004; Marian & Neisser, 2000; Larsen, Schrauf, Fromholt & Rubin, 2002; Marian & Kaushanskaya, 2007; Schrauf & Durazo-Arvizu, 2006). These studies suggest that memories are more likely to be retrieved if they are probed by the language in which the original event was encoded (e.g., Schrauf & Rubin, 2001, 2004; Marian & Neisser, 2000). This is called the *language specificity effect*. For example, Marian and Neisser (2000) asked Russian native speakers who later immigrated to the United States to recall specific life events that were prompted by some words such as holiday, summer, or blood. They found that when asked in the

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native language Russian, participants retrieved more experiences from the Russian-speaking period of their lives. In contrast, when asked in the later learned language, English, participants retrieved more experiences from the English-speaking period of their lives.

Other studies have shown that memories that are retrieved by the language of encoding are more detailed and emotional (e.g., Marian & Kaushanskaya, 2007). This refers to the *language congruity effect*. Given that most of our personal and social-life experiences involve communication in the native language, processing information in a foreign language may trigger images and memories, and their emotional associations less forcefully. In other words, the associative memory might activate a less rich network of ideas when processing information in a foreign language as compared to the native language.

This could explain why moral and sociocultural norms may be less accessible in a foreign language as compared to the native language. Normative knowledge, such as knowledge in the domain of harm and fairness, is learned and experienced early in life through social interaction (e.g., Shaw & Olson, 2012). Typically verbal communications about prohibitions and obligations (e.g., "Do not lie!", "Do not throw the paper on the floor!") are in the native language and involve the primary caregivers (e.g., Rottman & Young, 2015). As a result of language specificity and language congruency, moral and social norms may be less activated in a foreign language as compared to the native language. Because of that, moral and social norms might exert less influence on moral judgment. This could directly account for the present findings with moral judgment.

Language-dependent memory could also explain the foreign language effect on risk and benefit perception. When reading, for example, "travelling by airplane" in

the native language one might activate a richer network of mental representations than when reading it in a foreign language. Relatedly, in a native language the affective associations of a stimulus might be more prominent than in the foreign language. But to explain the results we need the additional assumption that the use of foreign language preferentially attenuates negative rather than positive associations. This could be the case because negative associations have fewer opportunities to be emotional grounded than positive associations (Sheikh & Titone, 2015), or because the use of a foreign language triggers automatic processes that supress access to distressing content (Wu & Thierry, 2012).

Cognitive load

Another, possibly complementary, reason why processing information in a foreign language may influence judgment and decision-making is cognitive load. Processing information in a foreign language requires cognitive resources (e.g., Volk et al., 2013). The increased cognitive load, in turn, may interfere with the ability to access moral and sociocultural norms, which would explain the results with moral judgment. It may also interfere with the ability to extract and process emotional information, which would partly explain the results with risk and benefit judgments. Below I discuss empirical evidence that supports these claims.

Studies have shown that cognitive load influences moral judgment (e.g., Buon, Jacob, Loissel, & Dupoux, 2013; Fonseca, Brauer, Moisuc, & Nugier, 2013). For example, Fonseca and colleagues (Fonseca et al., 2013) found that participants under cognitive load react ineffectively to moral norm violations. These results are in line with the evidence discussed in Chapters 3 and 4, which demonstrated that when using a foreign language participants judge potentially harmful moral norm violations more leniently. It could also explain the results with the footbridge dilemma. It could be

that reading this dilemma in a foreign language introduces cognitive load, which in turn interferes with the accessibility of the relevant moral norm ("Don't push people!"), and thus promotes consequentialist type judgments. An increased cognitive load could also explain the observed correlation between proficiency and moral judgment (for further evidence, see Costa et al., 2014). Recall that as proficiency increased, the gap in moral judgment between the foreign and native language conditions decreased. The reason for this could be that as proficiency increases, the burden placed on cognitive resources to comprehend the foreign language text decreases.

The cognitive load account could also explain the results on risk and benefit judgments. Studies have shown that cognitive load interferes with emotional processing. In a functional magnetic resonance imaging (fMRI) study, Van Dillen and colleagues (Van Dillen, Heslenfeld, & Koole, 2009) presented participants with neutral and negative stimuli and subsequently induced cognitive load by means of a concurrent arithmetic task. They found that cognitive load impaired the brain's reaction to negative stimuli (e.g. distressed faces) in regions that are typically associated with emotional processing. Crucially, participants under cognitive load indicated to feel less emotional in response to negative stimuli.

Similarly, Kron and colleagues (Kron, Schul, Cohen, & Hassin, 2010) investigated whether cognitive load influences the intensity of feelings. Participants counted backwards while watching emotional pictures, and subsequently rated their feelings. Kron et al. (2010) found that negative feelings were attenuated under cognitive load. These authors explain their findings with the *mere resource* hypothesis. This hypothesis states that the experience of feelings is a mental act that necessitates mental resources, resources that are depleted by simultaneous cognitive

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tasks. This depletion of mental recourses decreases the intensity of feelings. It could be that foreign language processing has a similar effect, which could explain in part the findings with risk and benefit perception.

Moreover, several theoretical accounts have linked cognitive load with other types of mental experiences such as vividness (e.g., Andrade, Kavanagh, & Baddeley, 1997; Baddeley & Andrade, 2000). Could it be that reading information in a foreign language reduces the mental experience of vividness? Support for this idea comes from research demonstrating that cognitive load influences the vividness of memorized images (e.g., Baddeley & Andrade, 2000). Baddeley and Andrade (2000), for example, asked participants to rate the vividness of visual and auditory stimuli while performing concurrent tasks such as counting. They found that cognitive load decreased the perceived vividness of the stimuli.

Vividness is typically defined as how concrete or imaginable something is, but can also refer to how emotional something is. A series of studies demonstrated that vividness influences judgment and decision-making (Nisbett & Ross, 1980). For example, in the domain of morality, Bartels (2008; see also Amit & Greene, 2012) found that increased vividness promoted deontological type judgments. This is consistent with the present findings in moral judgment. When moral dilemmas or transgressions are presented in the native language, as opposed to the foreign language, they might be perceived as more vivid, and thus promote deontological type judgments. To the extent that vividness is dissociable from emotional reactions, it could also explain why in the present studies we found no association between moral judgment and emotion ratings—the mediator could have been vividness. This vividness hypothesis could also account for the present findings about risk and benefit perception, as studies have shown a positive association between vividness and risk

perception (e.g., Traczyk, Sobkow, & Zaleskiewicz, 2015). Future studies could try to disentangle the role of vividness from that of emotionality in explaining the foreign language effect on judgment and decision-making.

In the previous sections I discussed two accounts through which the use of a foreign language may influence judgment and decision-making: the language specific memory account, and the increased cognitive load account. These accounts could also explain other foreign language effects on judgment and decision-making. For example, they can explain Keysar and colleagues' (Keysar et al., 2012) finding that the use of a foreign language reduces decision-making biases such as framing effects. Framing effects refer to the tendency of people to respond differently depending on whether the outcomes of an option are presented in terms of gains or losses (for reviews, see Levin, Schneider, & Gaeth, 1998; see also Kühberger, 1998). Specifically, when the outcomes are presented in terms of gains participants are typically *risk averse* (they prefer a sure gain over a probabilistic gain of the same expected value) whereas when they are presented in terms of losses participants are typically *risk seeking* (they prefer a probabilistic loss over a certain loss of the same expected value). Keysar and colleagues (Keysar et al., 2012) found that framing effects disappeared in a foreign language. They explained their findings in terms of increased systematic processing due to the reduced emotional resonance of losses in a foreign language. I claim that an attenuation of negative emotions suffices to explain these findings.

Does foreign language help or hurt judgment and decision-making?

One may wonder whether using a foreign language *helps* or *hurts* decision-making. I believe that the answer is not straightforward, but depends on the type of judgment or decision. Consider, for example, the foreign language effect on risk and

benefit perception. For some activities, such as smoking, using a foreign language might be hurtful. It would make people perceive such activities as less harmful and more beneficial than they actually are. However, the use of a foreign language could be used strategically, as a nudging technique (Thaler & Sunstein, 2008), to promote adoption of beneficial technologies. My colleagues and I have recently conducted a study (Geipel & Hadjichristidis, 2015) wherein we presented participants with a description of recycled water, stating that one of its sources is toilet wastewater (Rozin, Haddad, Nemeroff, & Slovic, 2015). Participants indicated whether they would be willing to drink recycled water and how comfortable they would feel in doing so. The use of a foreign language increased both the willingness to drink recycled water and ratings of comfort. In this particular case, using a foreign language was beneficial. It helped participants break a psychological barrier, which stopped them from embracing a beneficial technology.

In another study (Hadjichristidis, Geipel, & Surian, 2015), we presented participants with situations that included positive or negative superstitious circumstances, such as seeing a falling star or seeing a black cat crossing the street. We found that using a foreign language neutralized participants' feelings towards these circumstances. That is, the use of a foreign language reduced the influence of irrational beliefs. The root of this effect might be associative memory. Just like moral norms, positive and negative superstitions are transmitted to us typically during childhood through socialization in the native language (e.g., see Vyse, 1997). Because of that, reading about superstitious entities in the foreign language might activate less these culturally rooted fears.

Another potentially positive effect of processing information in a foreign language is that it might promote self-regulation. Research suggests that when

cognitive load is introduced early it interferes with the *recognition* of tempting stimuli, thus enhancing self-regulation (Van Dillen, Pappies, & Hoffman, 2013). When it is introduced late, it interferes with the wilful suppression of temptation, thus hindering self-regulation (e.g., Shiv & Fedorikhin, 1999). In the case of foreign language processing, cognitive load is introduced early—it is inherent to processing a foreign language.

Support for this claim comes from a study by Klesse and colleagues (Klesse, Levav, & Goukens, 2015). They asked native German speakers to (orally) order a dessert in a restaurant (fruit or cake) either in their native language or in English. Ordering in a foreign language resulted in healthier food selections. Furthermore, if it is true that foreign language attenuates temptation, then it could also have beneficial outcomes in other domains, such as inter-temporal choices about retirement decisions or investments. Individuals might be more willing to trade money today for a better life in the future, because they would be less impatient to spend money now.

Moreover, the use of a foreign language could potentially reduce prejudice. Studies have shown that an early introduction of cognitive load interferes with the relative accessibility and application of stereotypes (Gilbert & Hixon, 1991). For example, Gilbert and Hixon (1991) presented white female students with Asian targets. Participants who were exposed to the Asian target while rehearsing an eight-digit number showed no evidence of stereotype activation, whereas those who were not cognitively busy did show stereotype activation. The use of a foreign language could have a similar inhibition effect on the accessibility of stereotypes. The use of a foreign language might prove beneficial, for example, in the context of employee selection. By presenting information in a foreign language, the activation of certain stereotypes might be reduced leading to improved employee selection.

In sum, in some case the use of a foreign language might be helpful whereas in others it might be hurtful. This will depend strongly on the task in question. Certain intuitions, such as ethical norms, provide important guides for judgments and decisions. Hushing moral intuitions might hinder performance. However, in other cases (e.g. prejudice; magical thoughts) intuitive signals might be misleading, and so overcoming them would be beneficial.

Limitations

One limitation of the present research concerns the sample, which included mostly students (see Henrich, Heine, & Norenzayan, 2010). In future studies, it would be interesting to investigate more representative samples of the general population. It would also be interesting to examine whether the foreign language effects extend to experts, such as employees of multinational companies, diplomats of international organizations, or international medical staff. If the foreign language effects extend to experts then these effects would be of great applied significance. For instance, the use of foreign language could affect international public policy, which in turn affects all of us.

Another limitation of the present studies concerns the setting of the experiments. Most of the present experiments were conducted in controlled settings such as in classrooms. Such contexts might not simulate well the environment where typically the use of a foreign language may influence judgment and decision-making. In more naturalistic situations, such as in the work environment of multinational companies, the use of a foreign language might have different effects. For example, it is likely that in work environments there would be high demands on cognitive resources (Volk et al., 2014). For this reason it would be particularly important to

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conduct future studies in more naturalistic environments such as in multinational companies.

Furthermore, the present research investigated stated choices or ratings. It remains an open question whether foreign language effects would extend to behaviour and action. For example, the increase in leniency towards everyday moral norm violations (e.g., cut in line if in a hurry) might suggest that the use of a foreign language would translate into *unethical* behaviours. But this might not always be the case. Some tasks require more cognitive resources than others, and for these tasks it could be that the use of a foreign language might instead promote rather than hinder ethical behaviour (see Veer, Stel, & Beest, 2014). Veer and colleagues asked participants to privately roll a die three times and report the outcome either under high cognitive load or low cognitive load. Depending on what they rolled participants could receive more or less money. Therefore these experiment created a motivation to lie. They found that high cognitive load reduced false reporting. The authors concluded that in this particular task dishonest behaviour requires more cognitive resources than honest behaviour. To the extent that foreign language increases cognitive load, then I would expect that it would also promote ethical behaviour.

This is precisely what Bereby-Meyer and colleagues found (Bereby-Meyer et al., 2015). Using the same task as Veer et al. (2014), participants anonymously rolled a die and were paid accordingly to their reported outcome. Bereby-Meyer and colleagues found that using a foreign language as compared to the native language in this task resulted in less dishonest behaviour. This result supports the claim that foreign language use may increase cognitive load, thus leaving no cognitive capacities to serve one's self-interests by lying. It also shows that the effect of foreign language is malleable, and depends on several factors.

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A further limitation of the present studies is that we present no direct evidence in regards to the hypothesis that the use of a foreign language may suppress the activation of sociocultural and moral norms. Future studies could address this hypothesis by using word completion tasks and/ or lexical identification tasks. The idea is that if in a foreign language norms/rules are less activated than in the native language, then participants should be less likely to complete words (D_T_) in such a way as to signify moral-related concepts (DUTY), and be less fast in identifying words related to morality. In regards to the emotion attenuation account, we do present direct evidence that affect mediates risk/benefit judgments. However, it would be interesting to examine whether this effect would also manifest with more implicit measures, such as facial expressions while reading the moral dilemmas.

Conclusion

In this essay I examined whether and why reading information in a foreign language, as compared to the native language, influences moral judgment and choice and the perception of risk and benefit. I provided empirical evidence supporting that the use of a foreign language promotes consequentialist type judgments in trolley type dilemmas, and more lenient moral judgments towards both offensive but harmless transgressions and potentially harmful social and moral norm violations. The results suggest that the underpinning mechanism might be a reduced activation of sociocultural and moral norms. In relation to risk and benefit perception, the use of a foreign language increased the perception of benefit and decreased the perception of risk. This effect was mediated by a more positive affective valence of hazards in a foreign language.

In our globalized society, the use of a foreign language is a commonplace activity for millions of people. Studying how communication in a foreign language

affects judgment and decision-making is an exciting and significant line of research. I have presented preliminary results demonstrating that the use of a foreign language can sway judgment and choice. Future studies should focus on the underlying mechanisms, but they should also examine the impact that using a foreign language has in everyday life such as at work or home environments. Communicating in a foreign language not only helped Helmut Newton to overcome his blunter, but as we speak could be affecting all of us by shaping international policy.

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