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Abstract

We examined moral judgments in three types of language: a native national language (Italian), a non-native foreign language (English), and a native regional language (Venetian, oral and colloquial). We used the Moral Foundation Questionnaire to investigate cross-linguistic differences in multiple aspects of morality. Higher scores in the Harm, Purity and Fairness dimensions were obtained in the foreign and the regional language with respect to the national language. In addition, higher scores in the Ingroup dimension were obtained in the foreign language with respect to the native language. The effects of language on morality can thus be quite pervasive, involving a variety of aspects of morality. The differences we observed across these languages are explained in terms of their sociolinguistics – specifically, the greater use of national languages with moral values and beliefs. It is proposed that language effects arise because the language that is used activates information associated with it.

Introduction

A primary goal of moral theories is to identify the core ideals from which the values and norms forming the moral systems endorsed in individual societies are derived. Research conducted over the last few decades in anthropology and psychology (Fiske, 1991; Haidt & Joseph, 2007; Shweder, Mahapatra, & Miller, 1987) has exposed the shortcomings of theories proposing that morality is built upon a single core ideal – for example, harm (Gray, Young, & Waytz, 2012), justice (Kohlberg, 1971), or welfare (Harris, 2010). This research has instead promoted the view that multiple foundational, ‘irreducible’ elements underlie moral systems. The MORAL FOUNDATIONS THEORY (Graham, Haidt, Koleva, Motyl, Iyer, Wojcik, & Ditto, 2013) represents a noticeable example of this latter kind of theories. It proposes that the moral systems endorsed across different cultures have been constructed upon five basic elements, referred to as moral foundations (harm, fairness, ingroup, authority, and purity). Within theories assuming multiple core ideals, a comprehensive understanding of the moral judgments people take in given points in time requires we identify which of these core ideals each moral judgment reflects. We turned to the Moral Foundations Theory to characterize the effect of language on moral judgments. As reported in several recent studies, bilinguals’ decisions involving moral concerns may differ depending on which of their languages is used for framing the choices (for reviews, see Circi, Gatti, Russo, & Vecchi, 2021; Del Maschio, Crespi, Peressotti, Abutalebi, & Sulpizio, 2022a; Stankovic, Biedermann, & Hamamura, 2022). This finding has been observed, for example, with the footbridge dilemma that asks whether it is acceptable to push a stranger off the bridge in order to block a train that is out of control and would otherwise kill several innocent people. While people are generally opposed to sacrifice the stranger when asked in their native language (Cao, Zhang, Song, Wang, Miao, & Peng, 2017), bilinguals were more in favor of this option when a foreign language was used (Costa, Foucart, Hayakawa, Aparici, Apesteguia, Heafner, & Keysar, 2014). A first objective of our study is to determine which of the foundations proposed under the Moral Foundations Theory are affected by the language bilinguals use.

The finding that moral decisions change by experimentally varying the language used has been referred to as the foreign language effect (Costa, Vives, & Corey, 2017). The term underscores that differences emerged with foreign languages participants had typically acquired in school and did not routinely use in their daily lives. This term seems too limited in light of evidence that language effects extend to other types of languages. The preference for sacrificing the strangers found in the footbridge dilemma with foreign languages appeared also with Italian regional languages (Miozzo, Navarrete, Ongis, Mello, Giroto, & Peressotti, 2020). Defining sociolinguistic features of regional languages include a type of use that is almost

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exclusively oral and restricted to the family or exchanges with friends and acquaintances, which contrasts with a virtual absence in public institutions and media, contexts in which the national language (Italian) is compulsory (Maiden, 1995; Tuttle, 1997). A second objective of our study is to determine whether foreign languages and Italian regional languages have similar effects on moral foundations. Millions of speakers around the world use languages that share the key sociolinguistic features of Italian regional languages (Kirby, Gray, Greenhill, Jordan, Gomes-Ng, Bibiko, Blasi, Botero, Bower, Ember, Leehr, Low, McCarter, Divale, & Gavin, 2020), thus our results could shed light on widespread linguistic realities. But comparing languages differing so markedly with respect to age and form of acquisition, modality and contexts of use, and proficiency has also potential implications for explanations of the language effect on moral decisions, as we discuss next.

Beyond foreign languages

Explanations of the language effects on moral decisions aimed to identify the specific features of foreign languages responsible for the different decisions these languages promote. An explanation that has received increasing attention focuses on emotions (Costa *et al.*, 2017; Pavlenko, 2017), specifically the weakness with which foreign languages elicit emotions (Harris, Ayçiçeği, & Gleason, 2003). According to this explanation, reduced emotionality would promote a more reasoned decision processing, favoring a greater focus on ends than means, which, in sacrificial moral dilemmas, would facilitate utilitarian decisions associated with the larger gains (e.g., more people saved). An emotion-based explanation, however, is unlikely to apply to Italian regional languages that, differently to what is observed with foreign languages, elicit emotions of the same intensity as the national languages (Miozzo *et al.*, 2020). While an emotion-based explanation would anticipate different moral decisions between languages eliciting emotions of different intensities, foreign languages and Italian regional languages were found to induce comparable responses in the footbridge dilemma (Miozzo *et al.*, 2020). This similarity suggests instead that language effects stem from features shared between the two types of languages.

Foreign languages and Italian regional languages are not used in civic institutions, churches, and public media (Maiden, 1995), contexts playing a pivotal role in forging people's moralities. If the language with which the moral judgments are framed facilitates the retrieval of values and norms associated with that language, then values and norms that are integral to society's morality would be less available when second languages and Italian regional languages are used (Geipel, Hadjichristidis, & Surian, 2015; Miozzo *et al.*, 2020). This explanation of the similarity in the responses elicited by foreign languages and Italian regional languages in moral dilemmas rests on the assumptions that language contributes to the organization of memory and that decisions vary depending on what information is available. There is evidence supporting both assumptions. Memories are more accurate if the same language is used at encoding and retrieval, and autobiographical memories are more likely to be retrieved in the language in which the events were experienced (Rydell & Gawronski, 2009; Schrauf & Rubin, 2000; Wang & Ross, 2007). Results have also shown that bilinguals retrieved different knowledge structures depending on which of their languages was used (Marian & Kaushanskaya, 2004; Ross, Xun, & Wilson, 2002). For example, Chinese-English bilinguals described themselves

in more collective terms and endorsed traditional Chinese values more strongly when surveyed in Chinese compared to English (Ross *et al.*, 2002). Other studies have shown that implicit cultural biases toward ethnic groups (e.g., Arabs, Welsh) varied depending on the language that was used in the experiment (Danziger & Ward, 2010; Ellis, Hadden, & Jones, 2019; Ogunnaike, Dunham, & Banaji, 2010). On the other hand, when decisions have multiple outcomes, the final choice is in part determined by what information is retrieved and how early in the decision process the information becomes available (Johnson, Häubl, & Keinan, 2007; Weber, Johnson, Milch, Chang, Brodscholl, & Goldstein, 2007). The framing of the decision can change what information becomes available and when (Kahneman, 2003). Under this proposal, the framing varies depending on the language bilinguals use.

Despite their potential relevance for adjudicating between alternative explanations, similarities between foreign languages and Italian regional languages are presently limited to moral dilemmas. Assessing the effects of both types of languages on the moral foundations would help us to define the contours of their similarities, in addition to better characterize the implications of their similarities for explanations of the language effects on morality.

Moral Foundations: Theory and Testing

The Moral Foundation Theory originated from a survey of virtues and norms that are cross-culturally common and matched the adaptive challenges faced by our ancestors (Haidt & Joseph, 2007). This survey led to identify five foundations upon which moral systems have been constructed in different cultures: harm (related to caring, kindness, and compassion for victims; disapproval of harm), fairness (related to cooperation, justice, and trustworthiness), ingroup (related to patriotism, self-sacrifice, and loyalty to family, ethnic group, and nation), authority (related to respect for authority, obedience, deference, and leadership), and purity (related to cleanliness, chastity, and sacrality). According to the Moral Foundation Theory, children's cognition is naturally predisposed to acquire values and norms stemming from these moral foundations. Beginning early in development, and proceeding throughout the lifespan, these foundations provide the blueprints for intuitive moral judgments individuals made while interacting in specific cultural environments (Haidt, 2001). Similarly, these foundations are also instrumental in constructing more deliberate moral reasoning (Graham *et al.*, 2013). Although assumed to be universal, moral foundation could contribute differently to shaping morality in various cultures or social groups (Graham, Haidt, & Nosek, 2009; Haidt & Joseph, 2007).

To illustrate the key features of the theory, let us consider the example of harm. This moral foundation originated from the challenge unique to the human species of caring for vulnerable offspring for an extended period of time. Parents' ability to detect signs in the offspring of suffering, distress, and neediness has represented an adaptive trait that has increased offspring's chance of survival. "Whatever functional systems made it easy and automatic to connect perceptions of suffering with motivations to care, nurture, and protect are what we call the Care/harm foundation" (Graham *et al.*, 2013; p. 69). Although the initial triggers for caring were perceptual cues expressed by the child, caring has evolved to respond to the needs of an increasingly larger circle of individuals. While initially associated with feelings of compassion for those who suffer and anger toward those who cause

harm, care and harm have later been embedded in cultural discourses promoting caring as virtue and harm as vice.

The Moral Foundations Theory was instrumental in developing the Moral Foundations Questionnaire (MFQ), a scale assessing the ways in which people's moral beliefs and concerns revolve around the hypothesized foundations (Graham, Nosek, Haidt, Iyer, Koleva, & Ditto, 2011). The MFQ requires participants to make moral judgments of statements and scenarios that are specifically associated with one of the moral foundations. Each moral foundation has been shown to contribute to varying degrees to individuals' moral concerns (Graham et al., 2013). Furthermore, the MFQ have demonstrated good internal and external validity (Graham et al., 2011), and its 5-factor structure has generally held across diverse cultures (Doğruyol, Alper, & Yilmaz, 2019; Graham et al., 2011). Its usefulness in revealing the compositional nature of morality, combined to its structural validity, motivated our choice of the MFQ to investigate how language affects the moral foundations.

The present study

Moral dilemmas, which, by definition, juxtapose actions conforming to competing moral obligations (Brink, 1994), have been the test of choice in prior investigations of the effect of foreign languages on moral judgments. All 67 experiments listed in a recent review of such effect (Del Maschio et al., 2022a) examined moral dilemmas. There was a marked preference for sacrificial dilemmas relating to harm (59/67 experiments, 88%), of which the footbridge dilemma cited above provides a notable example. Crone and Laham (2015) reported that people's responses to sacrificial dilemmas were predicted by their MFQ scores in the foundations of harm, fairness, purity, and ingroup. If presenting the dilemmas in a foreign language affects the same foundations that Crone and Laham (2015) found to underlie the responses to the sacrificial dilemmas, one could reasonably anticipate that foreign languages would also affect the MFQ scores of these foundations. Predictions should be more tentative with respect to Italian regional languages, whose effects on sacrificial dilemmas have been investigated much less extensively (Del Maschio et al., 2022a). Nevertheless, the similarities between foreign languages and Italian regional languages that emerged with sacrificial dilemmas, would lead one to expect similarities to extend to the MFQ. Ingroup, however, stands out as the moral foundation in which foreign languages and Italian regional languages differ. Regional languages are shared with individuals from the same group who are expected to reciprocate a comparable commitment to loyalty, allegiance, and sacrifice to the group (Graham & Haidt, 2010; Janoff-Bulman & Carnes, 2013). By contrast, foreign languages represent a quintessential mark of affiliation to a different group (Cohen, 2012). Foreign languages and Italian regional languages could thus differ with respect to the ingroup foundation.

Consistent with the objectives of our studies – i.e., to determine which moral foundations are affected by foreign languages and whether Italian regional languages have analogous effects – we recruited two groups of bilingual participants. Participants in one group were presented with the MFQ either in the national language (Italian) or the foreign language (English); for the other group, the presentation was either in the national language (Italian) or in the regional language (Venetian) spoken in Veneto, a northeast region of Italy. Linguistically, Italy is a mosaic of regional languages coexisting with Italian, the national official language (Maiden, 1995). A number of lexical, syntactic, and

phonetic features make Venetian largely unintelligible to monolingual Italian speakers (Tuttle, 1997). If cross-linguistic intelligibility were the criterion for defining a language, Italian and Venetian should be considered distinct languages. Italian and Venetian also differ sociolinguistically (Tuttle, 1997). Italian is compulsory in formal settings, including schooling, public institutions, administrative functions, and religious services, and is predominant in public media. Venetian is spoken among family, friends, neighbors, and acquaintances. Formal linguistic training and literacy exist for Italian but not Venetian, which is nowadays almost exclusively oral (Tuttle, 1997). Both languages are acquired early and used routinely in Veneto, which makes many people in the region native, proficient bilinguals (Scaltritti, Peressotti, & Miozzo, 2017). Italians typically learn English as a foreign language in school. Its use in adulthood, if any, is usually limited to occasional meetings or media consumption (ISTAT, 2014).

Methods

Materials and procedure

a. Moral Foundation Questionnaire

The MFQ has two parts, which ask the participant to judge general statements (Part I) or more contextualized and concrete actions (Part II). The two parts have been shown to be highly correlated (Graham et al., 2011). The psychometric features of the MFQ, together with the need to administer an online test that was relatively short and highly engaging, motivated our choice of presenting only Part II. We used the version of the MFQ from Graham et al. (2009). Part II presents four items for each of the five moral foundations. To illustrate with examples from the harm foundation, the items described a hypothetical scenario (“If I saw a mother slapping her child, I would be outraged”), a positive virtue (“Compassion for those who are suffering is the most crucial virtue”), a statement about government policy (“The government must first and foremost protect all people from harm”), and a normative ideal (“It can never be right to kill a human being”). Because regional languages tend to have smaller vocabularies compared to national languages, the original English version of the MFQ was first translated into Venetian. Next, the Venetian version was translated into Italian, and then from Italian to English. In this way, we used an English version of the MFQ that was comparable to the Venetian and Italian versions. To verify the equivalence of the translations, bilinguals proficient in English back-translated the English version into Italian and Venetian. The materials we used are available at <https://osf.io/zyd4p/>.

Items were presented in different modalities in Venetian and English, a choice motivated by the sociolinguistics of the two languages, and justified by prior evidence concerning the effect of foreign languages on moral decisions. The oral nature of Venetian (Tuttle, 1997) dictated that we present the items orally in this language. Standardized national surveys, conducted by government agencies to assess Italian students' acquisition of foreign languages, revealed higher scores in written compared to oral comprehension (INVALSI, 2019), a discrepancy reflecting learning methods relying more on texts than spoken communication (Costa & Albergaria-Almeida, 2015; Faez, 2011). To maximize the comprehension of the items in the foreign language, items were shown in written English. Effects of modality have been examined in prior studies by comparing oral vs. visual presentations of moral dilemmas in native vs. foreign languages. Brouwer

(2019) reported language differences when participants listened to moral dilemmas, but not when they read those dilemmas. These results were not replicated when Muda, Pieńkosz, Francis, and Bialek (2020) re-analyzed the results from Brouwer (2019) and conducted a replication of Brouwer's (2019) experiment. Furthermore, the language effect did not vary between modalities in a more recent study of moral dilemmas (Brouwer, 2020). Collectively, published findings indicate that differences between oral and visual modalities remain elusive with the language effect.

To keep the same modality of presentation within each group, items were shown in Italian in two formats: written to the participants of the Italian–English group, oral to the participants of the Italian–Venetian group.

In all languages, items were administered one at the time, and each item appeared along with a 6-point scale that participants used to rate their agreement. Because the words used for labelling the scale are perceived as emotionally less intense in the foreign language, the scale would appear as more contracted when labeled in this language. To compensate for such a scale restriction, more intense ratings would be chosen, an effect known as the anchor contraction effect (De Langhe, Puntoni, Fernandes, & Van Osselaer, 2011). To avoid the anchor contraction effect, two symbols (thumb down, thumb up) were displayed at the scale ends. Participants responded by choosing a digit between 0 (greatest disagreement) and 5 (greatest agreement). In the English version of the questionnaire, participants were instructed to choose the option “I do not understand the English language” for any item that they felt they did not fully comprehend. This occurred only 10 times overall (0.12% of the items; these items were excluded from analyses). A do-not-understand option was not included in the Venetian version of the questionnaire because, as described below, only highly proficient Venetian speakers were tested in Venetian.

b. Assessment of language knowledge

Knowledge of English was assessed in two ways: Participants translated three English sentences into Italian, and self-rated their comprehension of the MFQ (1 = none; 10 = perfect). These data were used to exclude those participants whose English proficiency would not support a sufficient comprehension of the MFQ (incorrect translation of more than one question and/or self-rated MFQ comprehension score <5). Knowledge of Venetian was assessed through an 8-item grammaticality test from Miozzo et al. (2020). These data were used to exclude participants who were not speakers of Venetian but, because of living in the Veneto region, became familiar with it and used the partial resemblance with Italian to guess the meaning of the items. Only data from participants who answered correctly to 7/8 responses of the grammaticality test were included in the analyses. Instructions for all tasks were in Italian. Age of acquisition, self-reported proficiency, and use were assessed for English or Venetian with the Language Use Questionnaire administered in Italian (Scaltritti et al., 2017). Participants self-rated their proficiency in comprehension and production of English or Venetian using a 10-point Likert scale, where 1 corresponded to “no competence” and 10 to “perfect competence.” A self-rated proficiency score was created by averaging comprehension and production scores. A language use score was obtained by averaging the percentages of time that a participant reported using the language in various contexts (in the family, with friends, in the city/town, at work, while reading and watching movies).

c. Task administration

All participants were first informed about the nature and duration of the task. Participants were then randomly assigned to one language (Italian or Venetian; Italian or English), and the MFQ was introduced and administered in that language. Next, they completed the tasks assessing the knowledge and use of the language (Venetian or English) tested in their group. A final written question asked whether they consented to use their data for research. While the language of the MFQ varied across conditions, Italian was used for the other sections of the study with all participants. Stimuli presentation and response recording were operated through Qualtrics (<https://www.qualtrics.com>). The research protocol was approved by the Ethical Committee for Psychological Research of the University of Padova (Protocol n. 3701).

Participants

A ‘snowball’ procedure was used for enrolling participants through social media. We directly contacted a few individuals, asking them to send the participation invitation to friends, who in turn disseminated it further. Separate contact chains were created for recruiting the two groups of participants, one tested in Italian and English, the other in Italian and Venetian. Invitations mentioned that knowledge of English (or Venetian) was required. Sample size was determined based on the meta-analysis of Del Maschio et al. (2022a), which was conducted over 91 experiments investigating the effect of language on decision-making, including decisions related to morality, and revealed a reliable, though small, language effect. To determine the appropriate sample size for our design, we conducted an a-priori sample size calculation for linear multiple regression, using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) and the following parameters: effect size = 0.03, number of tested predictors = 5, alpha level = 0.05, and power = 0.9. The calculation indicated a minimum sample size of 555 participants.

A total of 723 participants completed each part of the study and gave their consent for data use. We excluded from analyses (a) 4 participants who reported to be younger than 18 years old; (b) 31 participants in the Italian–English group who incorrectly translated more than one question, and/or rated their comprehension of the MFQ <5; and (c) 44 participants in the Italian–Venetian group who responded incorrectly to more than two responses in the grammaticality test, and/or rated their Venetian proficiency ≤ 5 . Overall, the data of 79 participants were excluded. We analyzed the responses of 382 participants in the Italian–English group and 262 participants in the Italian–Venetian group.

The two groups (Italian–English, Italian–Venetian) differed for age and gender. Participants were older in the Italian–Venetian group (mean (sd): 42.4 (13.9) vs. 31.9 (11.1) years; $t(642) = 12.38$, $p < .0001$). Men were overrepresented in the Italian–Venetian group (64.5%), women in the Italian–English group (68%; $\chi^2 = 76.54$, $p < .0001$). These differences are consistent with data from the national census, according to which regional languages are more used by older generations and among men (ISTAT, 2014). To the extent that both groups were self-selected – only people with knowledge of English or Venetian participated in the study – we should expect the differences found for age and gender.

Within each group, participants assigned to one of the two languages were matched for the controlled variables (see

Table 1. Gender (% females), mean age (N years), percentage of participants who acquired English/Venetian before age 5, mean self-estimated proficiency in English/Venetian, and mean percentage of use of English/Venetian, across groups and languages. Standard deviations are reported in parenthesis.

Group	N	% Females	Age	Before 5 years	Proficiency ^a	Use ^b
<i>Italian-English</i>						
Tested in Italian	193	69.94%	31.93	0.31%	7.42	27.86%
			(10.63)		(1.52)	(17.14)
Tested in English	189	66.14%	32.02	0.47%	7.63	26.22%
			(11.60)		(1.35)	(16.32)
<i>Italian-Venetian</i>						
Tested in Italian	129	30.23%	41.62	86.3%	9.22	64.17%
			(13.93)		(1.03)	(26.31)
Tested in Venetian	133	38.81%	43.17	87.5%	9.23	66.90%
			(13.85)		(1.16)	(26.51)

^aSelf-rated proficiency rated on a 10-point scale (1 = no competence; 10 = perfect competence)

^bTime (%) during which participants reported using the language, averaged across contexts

Table 1). In the Italian–English group, participants assigned to the two languages were matched for gender ($\chi^2 < 1$) and age ($t < 1$), as well as for percentage of participants who acquired English before the age of 5 ($\chi^2 < 1$), self-rated English proficiency ($t = 1.52$, $p = .12$), and percentage of time spent using English ($t < 1$). In the Italian–Venetian group, participants in the two language conditions were matched for gender ($\chi^2 = 2.27$, $p = .131$) and age ($t < 1$); furthermore, the percentage of participants who acquired Venetian before the age of 5 ($\chi^2 < 1$), self-rated Venetian proficiency ($t < 1$), and percentage of use ($t < 1$) of Venetian were comparable.

Stark differences emerged with respect to the use of English and Venetian as reported by our participants, as shown in Figure 1. Most Italian–Venetian bilinguals reported they had acquired Venetian at an early age, and commonly used it in the family, among friends, or where they lived; by contrast, for Italian–English bilinguals, English use was mostly restricted to work and media consumption. Between groups, differences also emerged with self-estimated proficiency – proficiency scores were higher for Venetian than English ($t(642) = 16.22$; $p < .0001$; see Fig. 2).

Statistical analyses

JMPPro15 software (SAS Institute) was used for statistical analyses. Five mean scores were obtained for each participant by averaging the participant's responses to the four items tested in each moral foundation. A linear regression model was built for each moral foundation, using the mean scores of the moral foundation as dependent variable. The model aimed to reveal whether or not responses varied to the same extent in Venetian and English relative to Italian. To this end, the predictors entered in the model were not only Group (Italian–Venetian vs. Italian–English bilinguals) and Language (Italian vs. Venetian or English), but also their interaction. The Group x Language interaction informs us on whether or not Venetian and English induced similar language effects. The two bilingual groups were self-selected and not controlled for variables that prior studies have shown to affect moral judgments including, for example, social class (Côté, Piff, & Willer, 2013) or political views (Graham et al., 2009). Group effects could have reflected the lack of control of these variables; they are reported for sake of completeness but were not analyzed

further. Age and Gender (excluding 10 participants who chose not to report gender) were added as predictors in the model, as both variables have been shown to modulate responses to the MFQ (Graham et al., 2011; Nilsson, Erlandsson, & Västfjäll, 2020).

Results

Figure 3 shows the estimated mean foundation scores for each language and group, as well as the parameters of the regression model carried out for each moral foundation. The effect of the Language predictor was significant ($p < .05$) for the harm and purity foundations, and approached the significance level ($p = .06$) with the fairness foundation. These effects arose because of higher scores in English and Venetian relative to Italian; mean scores: (a) harm (English = 3.90, Italian = 3.44; Venetian = 3.56, Italian = 3.26); (b) purity (English = 2.57, Italian = 2.22; Venetian = 3.12; Italian = 3.09); (c) fairness (English = 3.83, Italian = 3.77; Venetian = 3.96, Italian = 3.81). A significant Group x Language interaction was found for the ingroup foundation, reflecting a stronger endorsement of ingroup loyalty in English relative to Italian (mean scores: 1.64 vs. 1.37) but a comparable endorsement between Venetian and Italian (mean scores: 1.88 vs. 1.89). Crucially, the lack of a significant interaction with the other moral foundations revealed that Venetian and English had comparable effects in all these other moral foundations.

A main effect of Group was not found with harm and fairness foundations. However, ingroup, authority, and purity foundations were more strongly endorsed by Italian–Venetian bilinguals than Italian–English bilinguals, independently of the language used for testing each group. It is unlikely that the effects of Group were driven by the different modalities with which the MFQ was presented between groups, given that modality differences should have affected all foundations, not just some of them as we found. As mentioned in the Method section, the two groups were recruited through different contact chains and self-selected as speakers of either English or Venetian. It is plausible that they differed with respect to a number of variables, including social status and political views that prior research has shown to affect the responses to the MFQ (Côté et al., 2013; Graham et al., 2009). For example, conservatives showed

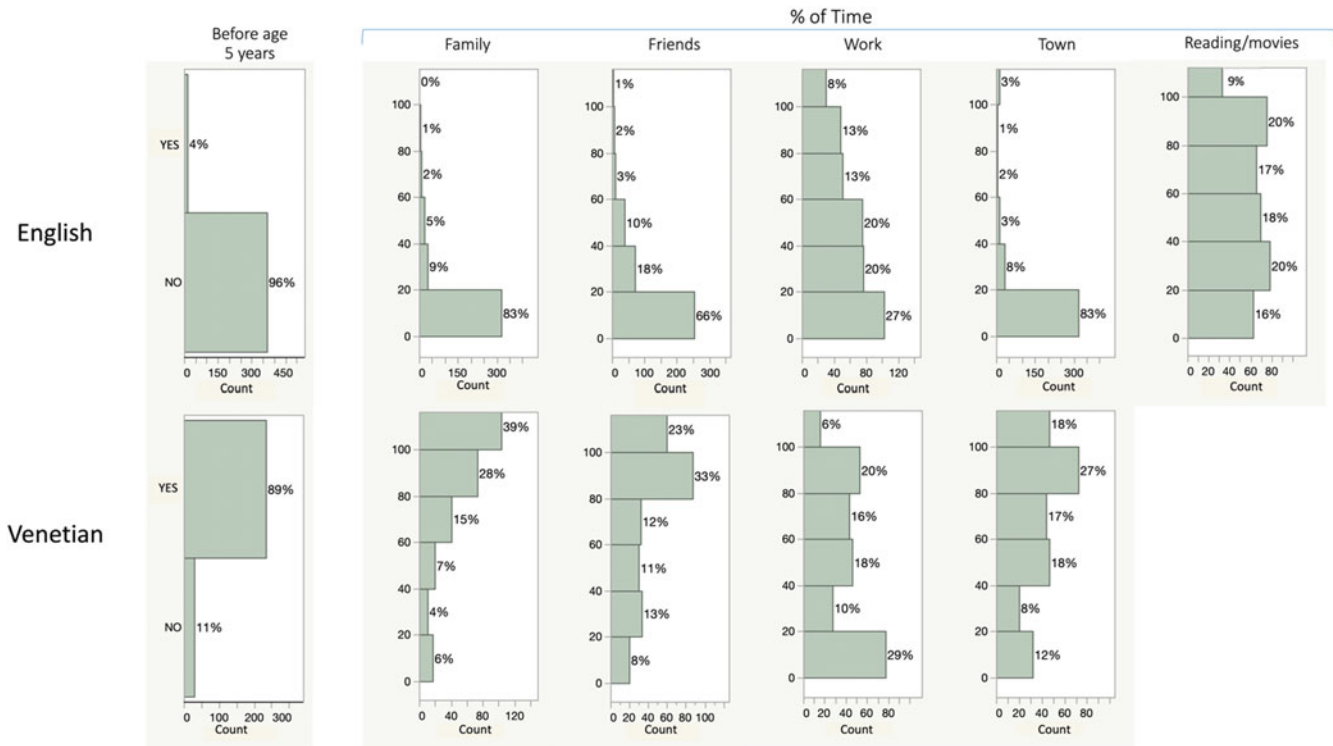


Figure 1. Response distributions in the Language Use Questionnaire querying the use of English or Venetian. Participants only rated the language (English or Venetian) tested in their group. The first column shows whether participants reported having acquired English (or Venetian) before year 5. The other columns illustrate the percentage of time in which participants reported using English (or Venetian) in different contexts – in the family, with friends, at work, with people from the same city/town, and while reading or watching movies (the latest context was not queried in Venetian, a language that is almost exclusively oral and virtually never spoken in movies). Percentage of time was divided into 5 intervals; we show the percentage of participants who reported using the language in each interval. The x-axis reports response number.

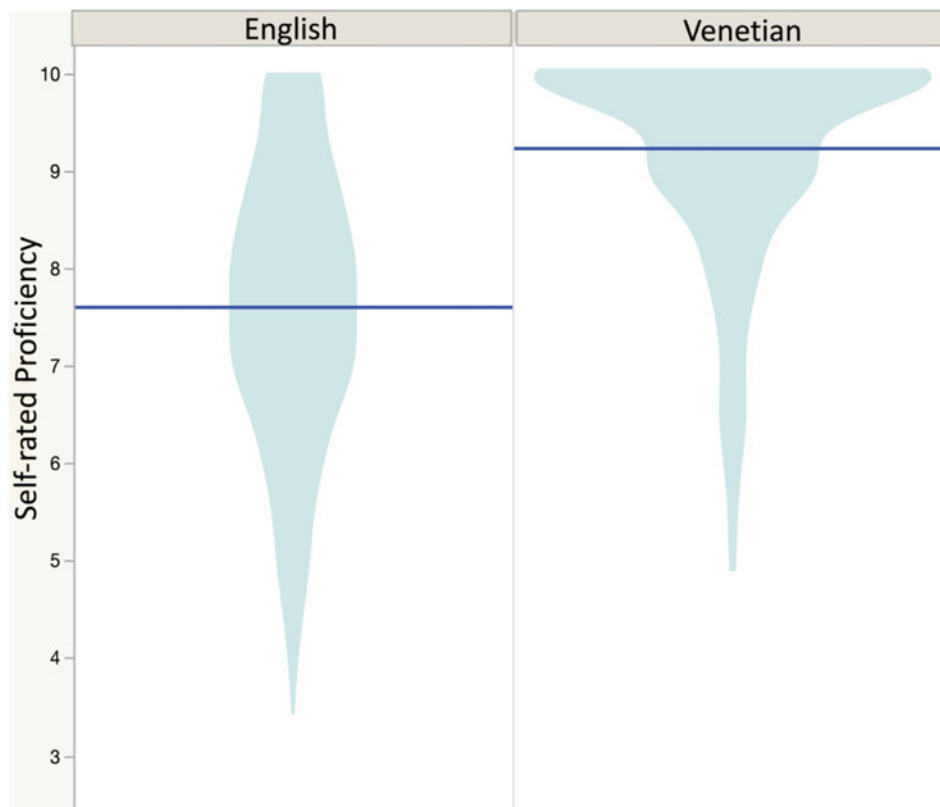
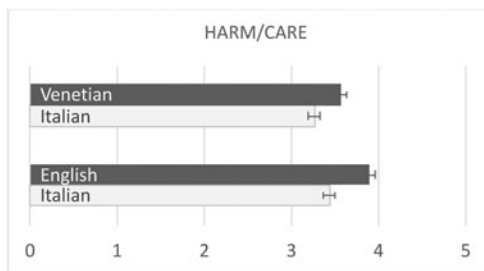
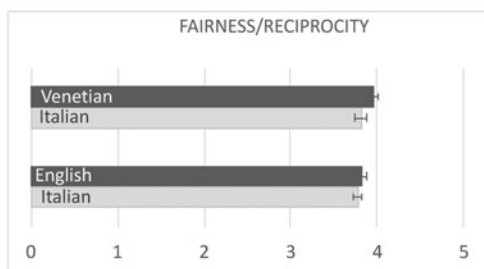


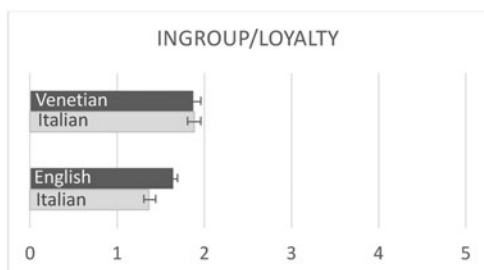
Figure 2. Contour plot of self-rated proficiency in English and Venetian. Scores were obtained from the whole sample of Italian–English and Italian–Venetian bilinguals, respectively. They were expressed on a 10-point scale (1 = no competence; 10 = perfect competence). The blue line corresponds to the mean score.



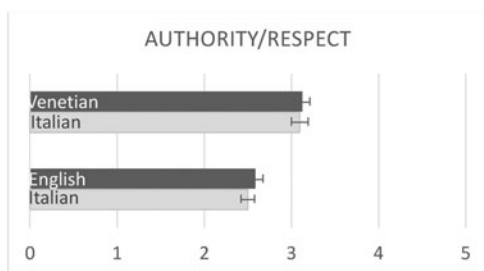
	Estimate	t	p value
(Intercept)	3.198	31.4	<.0001
Gender	0.180	5.25	<.0001
Age	0.009	3.62	0.0003
Group	0.128	3.43	0.0006
Language	-0.190	-5.90	<.0001
Group * Language	-0.041	-1.27	0.2038



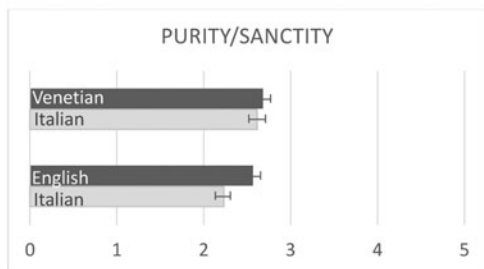
	Estimate	t	p value
(Intercept)	3.736	43.87	<.0001
Gender	0.066	2.31	0.0211
Age	0.003	1.34	0.1798
Group	-0.042	-1.36	0.1731
Language	-0.049	-1.85	0.0652
Group * Language	0.023	0.86	0.3885



	Estimate	t	p value
(Intercept)	1.64	15.19	<.0001
Gender	-0.112	-3.10	0.0020
Age	0.001	0.51	0.6105
Group	-0.189	-4.79	<.0001
Language	-0.064	-1.87	0.0624
Group * Language	-0.069	-2.02	0.0437



	Estimate	t	p value
(Intercept)	2.401	19.04	<.0001
Gender	-0.030	-0.71	0.4782
Age	0.012	3.64	0.0003
Group	-0.280	-6.07	<.0001
Language	-0.029	-0.72	0.4742
Group * Language	-0.019	-0.47	0.6413



	Estimate	t	p value
(Intercept)	1.876	12.99	<.0001
Gender	0.074	1.51	0.1303
Age	0.018	4.83	<.0001
Group	-0.123	-2.33	0.0200
Language	-0.101	-2.21	0.0274
Group * Language	-0.072	-1.57	0.118

Figure 3. The graphs show the estimated mean scores found for each moral foundation in each experimental group, according to the language in which the MFQ was presented (Italian/English or Italian/Venetian). Scores ranges from 0 (greatest disagreement) to 5 (greatest agreement). Error bars correspond to standard error. The panels show the results of the regression models conducted for each foundation, using Group (Italian–Venetian vs. Italian–English), Language (Italian vs. Venetian or English), Group x Language interaction, Gender, and Age as predictors.

greater endorsement of ingroup, authority, and purity foundations compared to liberals (Graham *et al.*, 2009). Imbalances with these variables could have determined the group differences we observed, an explanation speculative in nature as we did not collect data on social status or political self-identification.

The significant effects of Age in the harm, authority, and purity foundations reflected a score increase with aging. The significant effect of Gender in the harm and fairness foundations were due to higher scores for female participants, whereas its significant effect in the ingroup foundation resulted from the higher scores of male participants. The effects of Age and Gender found in these foundations replicated results from prior studies (e.g., Côté *et al.*, 2013; Graham *et al.*, 2011; Nilsson *et al.*, 2020). It is unlikely that variations in age or gender could have determined the differences observed between Italian and Venetian, or between Italian and English, as age and gender were matched between the participants compared for each of these language pairs.

General Discussion

We found a similar language effect in the Harm, Fairness and Purity dimensions for both foreign and regional language bilinguals. In addition, foreign language bilinguals showed a language effect also in the Ingroup dimension. That foreign language affects multiple moral foundations is expected within the kind of moral system envisioned by the Moral Foundation Theory, which is built upon interrelated elements. In an architecture of this sort, effects should spread across moral foundations, rather than remain restricted to a single moral foundation. An effect of this scope should manifest itself in a similarly pervasive manner on moral judgments. In line with this expectation, the many experiments conducted so far have revealed that foreign languages affected decisions concerning not only harm but also fairness and purity (Brouwer, 2019; Geipel *et al.*, 2015; Urbig, Terjesen, Procher, Muehlfeld, & Van Witteloostuijn, 2016). Interestingly, the same moral foundations affected by the foreign language were reported to underpin decisions on sacrificial dilemmas (Crone & Laham, 2015). Such a convergence of evidence makes it more plausible that the effects of foreign languages on moral foundations could result in observable changes in decision-making.

The regional language (Venetian) and English elicited almost identical responses in the MFQ, which in turn differed from the responses provided in Italian, our participants' native language (Fig. 3). The differences with respect to Italian were widespread and consistent in form: In four of the five moral foundations (harm, fairness, purity, ingroup), scores were higher in Venetian or English relative to Italian. These differences appeared even though, across languages, responses patterned very similarly – in all languages, for example, scores were the lowest with the ingroup foundation, and the highest with harm and fairness foundations. The similarities between Venetian and English observed in the MFQ stand in sharp contrast with the marked differences in the experiences our participants reported for these languages. Most of them had learned Venetian as young children and used it routinely in the family, with friends, and in their cities or towns. English, a language they had typically learned at a later age in school, was seldom used in those contexts.

Our findings revealed that the similarities between foreign languages and Italian regional languages previously reported for sacrificial dilemmas (Miozzo *et al.*, 2020) extended to the responses in the MFQ. This convergence of findings further constrains

explanations of the language effects on morality. One of its implications concerns explanations linking the language effects to specific features of foreign languages, including reduced emotionality, relatively late age of acquisition, or limited proficiency. Because these features are not shared with Italian regional languages, explanations based on these features would not extend to these other types of languages. The convergence of findings suggests, instead, that language effects stem from features that foreign languages and Italian regional languages have in common. One proposal identifies their sociolinguistic features as a possible source of their effects on morality (Geipel *et al.*, 2015; Miozzo *et al.*, 2020). The use of Italian regional languages and English is limited compared to Italian (Tuttle, 1997). Both languages are essentially absent in institutional and public contexts, national and local media that are largely responsible for shaping our moral experiences and perspectives – here, Italian is used. Under the hypothesis that the language with which the MFQ or the moral dilemmas are administered facilitates access to the information associated with that language (Geipel *et al.*, 2015; Miozzo *et al.*, 2020), responses to MFQ should reflect the sociolinguistics of Italian, English, and Venetian. Specifically, responses would be similar in English and Venetian but different from responses in Italian – at least with respect to aspects of morality associated with contexts in which asymmetries exist regarding the use of English and Venetian vs. Italian. Mapping how values, ideals, concerns, and obligations forming the fabric of morality are discussed in the environments in which these types of languages are used is certainly an area that needs further investigation. The multiplicity of the moral foundations in which differences emerged across languages suggests, however, that environmental variations affect a wide range of aspects of morality.

The effect of foreign languages was found to be modulated by defining features of bilingualism, including the age at which the two languages are acquired, their proficiency, and the extent of their use, as reported in some studies (e.g., Costa *et al.*, 2014; Del Maschio, Del Mauro, Bellini, Abutalebi & Sulpizio, 2022b; Geipel *et al.*, 2015; for reviews, see Circi *et al.*, 2021; Del Maschio *et al.*, 2022a; Stankovic *et al.*, 2022). These features could determine, to various degrees, the amount of exposure to morality in contexts in which the language is used. To illustrate, a person using English as a second language more frequently is more likely to encounter moral issues in a second language relative to a person whose English use is more sporadic. Crucially, it is still possible that languages differing in terms of age of acquisition, proficiency, or amount of use could affect moral decisions in similar ways, as indeed observed between foreign languages and Italian regional languages. To the extent that both languages limit the exposure to moral issues in similar ways, they would induce comparable effects, irrespective of their other differences. On the other hand, differences in the effects on morality could be anticipated in the case of languages used proficiently and routinely but associated with cultural traditions endorsing distinct moral systems. Such differences emerged with Hindi–English bilinguals (Winskel & Bhatt, 2020).

The vast literature on the MFQ may provide some cues to explain the higher MFQ scores found in English and Venetian compared to Italian. Of relevance here are the studies that explored the moral systems underpinning different political views (e.g., Graham *et al.*, 2009) or attitudes toward divisive issues such as abortion or immigration (e.g., Koleva, Graham, Iyer, Ditto, & Haidt, 2012). Stronger endorsements of moral concerns regarding authority, harm, fairness, ingroup, and purity were held

by those with more extreme liberal or conservative views, or by those who expressed more polarized positions with respect to such divisive issues. The stronger beliefs held by those embracing more extreme opinions are in part based on relatively narrow views that would make it less likely to consider alternatives that could temper their judgments (Malka & Lelkes, 2010; Waytz, Iyer, Young, Haidt, & Graham, 2019). Similarly, stronger endorsements would appear especially in English or Venetian, languages that are not associated with a moral system as wide, rich, and diverse as the one available in Italian. By contrast, Italian would favor more balanced, nuanced moral judgments aligning more closely with the concerns typically shared in the society.

A foreign language effect appeared with the ingroup foundation. Loyalty to the group and the nation was valued more in English than in the native language. This foreign language effect aligns with results showing that a foreign accent induced stronger in-group attitudes (Pantos & Perkins, 2013). Foreign accent has been demonstrated to be a salient and reliable marker of group membership (Kinzler, Shutts, DeJesus, & Spelke, 2009; Rakić, Steffens, & Mummendey, 2011) and evolutionarily could have been instrumental for establishing group membership and the emergence and maintenance of cooperation (Cohen, 2012). To the extent that prior results associate the in-group bias with foreign languages, the bias should not appear with native languages, as we found with both native languages we tested (Italian and Venetian).

Researchers on bilingualism have repeatedly highlighted how widely the experiences bilinguals have with their languages can vary (Grosjean, 2020; Kroll, Dussias, Bice, & Perrotti, 2015; Valian, 2015). Our findings underscored how similar these experiences can also be. Differences and similarities can coexist, as vividly illustrated by the different types of languages (national, foreign, and regional) our participants use. We exploited similarities as well as differences to test hypotheses about the effects of language on morality, adopting a cross-linguistic approach that enabled us to reveal how individual languages behave distinctively (or don't). Morality also varies. We took advantage of the Moral Foundation Theory to map the extent of the language effects. Relying on this theoretical foundation, we could better characterize their contours and reveal that these effects can be quite extensive, affecting the majority of moral domains, but also subject to change depending on the characteristics of individual languages.

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Competing Interests. The authors declare none.

Data availability. The data that support the findings of this study are openly available in <https://osf.io/zyd4p/>

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