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THE EFFECT OF NATIVENESS OF LANGUAGE ON SOCIAL NORM ADHERENCE

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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ABSTRACT

Social norms can influence many decisions and behaviors, but whether people abide by norms depends on the situation. This dissertation explores a novel account that language may impact the extent to which people conform to social norms. In principle, norms are represented at a conceptual level and should not depend on language. However, I hypothesize that the very use of a native language promotes norm-abiding behavior. If this is true, then using a nonnative language should attenuate norm adherence. This account is motivated by research suggesting that norms may be more accessible in a native language relative to a nonnative language. For example, native languages are the conduits through which norms are learned, because much of moral development occurs during childhood (e.g. Rottman & Young, 2015). Native languages are also more emotionally resonant than nonnative languages (e.g., Aycicegi & Harris, 2004). This suggests that emotions triggered in response to norm violations, such as disgust and anger (e.g. Gutierrez & Giner-Sorolla, 2007), may be experienced less intensely in a nonnative language. If social norms are more top of mind in a native language, it is reasonable to expect that bilinguals may also be more likely to abide by social norms when using a native language compared to a nonnative language. In this dissertation, I explore this hypothesis in two decisional contexts.

First, this account predicts that bilinguals would choose to discuss embarrassing and socially sensitive matters using a nonnative language, because it is less associated with social norms. In Experiments 1 to 5, I evaluated bilinguals' choice of language for speaking about a variety of embarrassing content that included sexual taboos (Experiments 1 to 3), disgusting bodily activities (Experiments 1, 4, and 5), and intrusive questions about sensitive topics (Experiments 4 and 5). Participants were more likely to choose a nonnative language to speak

about embarrassing content (compared to neutral topics). This was true among bilinguals who use English as a nonnative language (Experiments 1 and 2: Cantonese-English bilinguals, Experiment 4: Mandarin-English bilinguals) as well as bilinguals who speak English as a native language (Experiment 5: English-Spanish bilinguals). These findings traverse cultural and linguistic boundaries and are found with a variety of embarrassing topics, suggesting that the effect is not driven by cultural rules about specific taboos. Rather, bilinguals' language choices are likely driven by the differences between a native and nonnative language, although it is possible that cultural norms of self-disclosure contributed to the effect. In Experiments 4 and 5, I evaluated these potential mechanisms, including the emotional and social consequences that people anticipated when using different languages, the degree to which people associated what they would say in different languages with their sense of self, as well as perceived cultural norms of disclosure. Additionally, Experiment 3 explored a boundary condition by testing Mandarin-English bilinguals. Bilinguals did not choose a nonnative language to discuss embarrassing topics when the nonnative language overlapped significantly with the native language in terms of culture and morphology.

While the first part of the dissertation evaluates the languages bilinguals choose to use when they violate social norms, the second part evaluates how the use of a language impacts their norm-violating behavior. If a native language promotes norm-abiding behavior, then bilinguals should be more likely to divulge sensitive information in response to intrusive questions presented in a nonnative language compared to a native language. Experiment 6 supports the account as Mandarin-English bilinguals were more likely to divulge in English compared to Mandarin. However, Experiment 7 does not support the account because Hebrew-English bilinguals showed no difference in divulging behaviors across language conditions. The

mixed results suggest that culture may moderate this phenomenon, for example, by influencing participants' perceptions of how intrusive the stimuli are.

Foreign language use is a fundamental aspect of human interactions as millions of people around the world use more than one language every day. We know from earlier studies that foreign language use promotes decisions which are less emotionally grounded (e.g. Keysar et al., 2012), yet other behavioral consequences of using a nonnative tongue remain under-researched. This dissertation tests how using a native versus foreign language influences adherence to social norms. It expands our understanding of how bilinguals communicate and interact with language.

Keywords: norms, bilingual, native, foreign, language, embarrassment

INTRODUCTION

Our decisions are constrained by social norms. When we feel appalled by the idea of initiating a conversation about sexual fantasies or when we hesitate about confessing to having cheated on an exam, we may be guided by societal expectations that these are inappropriate and undesirable behaviors. Social norms are unspoken rules that constrain behavior without the force of the legal system. Rather, norms exert their power through social interactions by representing standards that are mutually understood by people within the community. Through observing behaviors of those around them, people develop an understanding of the norms that are relevant to their social networks. Social forces reinforce norms and discourage norm-violation by imposing sanctions on people who deviate from norms (Cialdini et al., 1990; Cialdini & Trost, 1998; Opp, 1982).

Social norms are so immensely powerful that people sometimes conform to group pressures even when the majority opinion is clearly wrong, as demonstrated by Asch in a classic experiment on social influence. In a series of experiments, participants responded to simple visual perception questions in groups. When participants did not know other group members' answers, only 1% of participants gave the wrong answer. In contrast, when confederates in the group unanimously agree on the wrong answer, about a third of the participants conformed with the incorrect majority view (Asch, 1956). The influence of social norms extends beyond laboratory experiments and have been demonstrated to motivate behaviors in a range of applied settings. Findings from field experiments show that normative messages successfully promote environmental conservation (e.g. Goldstein et al., 2008; Schultz et al., 2007), prevent alcohol misuse (e.g. Perkins, 2002; Prentice & Miller, 1993), and mobilize voters (e.g. Gerber & Rogers, 2009).

Just because norms are powerful does not mean people always follow them. The decision to abide by social rules is complex and depends on situation factors such as norm accessibility, emotions, and the need to belong. In any given context, there could be more than one set of norms that are relevant, and the norms that are most accessible in the moment determine how people will react. For example, participants littered less in dirty environments when researchers focused their attention on injunctive norms (i.e. what most people approve or disapprove), but not when researchers focused their attention on descriptive norms (i.e. what most people do) (Cialdini et al., 1990, 1991). In another experiment, researchers presented participants with descriptions of a social interaction between two students to manipulate communal relationship norms (based on interpersonal concerns) and exchange norms (based on quid pro quo). Consumers who read about communal norm relationships were more loss averse and less willing to give up their possessions, potentially because communal norms engaged more emotional attachment than exchange norms (Aggarwal & Zhang, 2006). Aside from accessibility, moral and social emotions also foster adherence to social norms. When researchers manipulated guilt by making participants tell a lie or upset carefully arranged index cards, the guilty participants complied more than the control participants in a later task (Freedman et al., 1967). Taboo behaviors that violate norms, such as incest and necrophilia, also instigate disgust and anger (Gutierrez & Giner-Sorolla, 2007). Additionally, conformity to social norms is linked to the fundamental human need for belongingness. For example, political partisans experienced threats to belonging after violating norms of their political party and advocating for an opposing candidate (Prewitt-Freilino et al., 2012), while negotiators with a higher dispositional need to belong were more likely to abide by norms (Steinel et al., 2010).

Hence, the decision to abide by social norms could be driven by factors that influence the accessibility of norms, the intensity of moral or social emotions, and the relevance of belonging to a community. Language could be one such factor because of its unique role in being a conduit for norm transmission (Allison, 1992; Lumsden, 1988), as well as its ubiquitous impact on our emotional experiences (e.g., Aycicegi & Harris, 2004) and social lives (e.g. Kinzler et al., 2007). Here, I focus on the difference between native and nonnative languages for bilinguals, and discuss how native language use may increase the relevance of norms through intensifying emotion, increasing accessibility of norms, and fostering psychological ties to the community.

How might native language use increase the reliance on social norms?

Native languages are more emotionally resonant and this may be conducive to norm-abiding behavior. Self-report and physiological studies demonstrate that bilinguals react more strongly to emotional expressions and taboo words presented in a native language than the same words presented in a foreign tongue (e.g., Aycicegi & Harris, 2004; Dewaele, 2004b; Harris et al., 2003). Using an emotionally distanced nonnative language may influence decision-making, because nonnative languages mitigate heuristic biases such as framing and loss aversion (Keysar et al., 2012; Costa et al., 2014a) and motivate utilitarian responses in moral dilemmas (Cipolletti et al., 2016; Costa et al., 2014b; Geipel et al., 2015b). Furthermore, language impacts moral choice by blunting emotional reactions associated with violating deontological rules (e.g. the prohibition of killing in a trolley dilemma) (Hayakawa et al., 2017). Based on what we know about the role of language on emotion and decision-making, it is reasonable to expect that the general emotional blunting effect of foreign language use would apply to emotions that motivate norm adherence. In other words, using a more emotionally immersive native language may encourage bilinguals to adhere to norms because they experience stronger guilt, disgust, anger,

and other moral or social emotions (e.g. Freedman et al., 1967; Gutierrez & Giner-Sorolla, 2007).

Norms may also become more accessible in a native language because many moral and social rules are learned via parent-child communication in a native language environment. For example, children's judgments and reactions to harm depend on how parents communicate to them in the aftermath of a situation. Children are more likely to aid or comfort a person they have hurt if their mothers explain the distress they caused to others and deliver the explanation with emotion (Nichols et al., 2013; Rottman & Young, 2015; Zahn-Waxler et al., 1979). Since memories that are relevant to the development of social norms are often encoded in a native language, using a native language may provide better access to such memories and subsequently increase the accessibility of norms. In other words, social rules and expectations are more top of mind in a native language context where childhood memories are more accessible (e.g. Marian & Neisser, 2000).

Native language use may also strengthen norm adherence by fostering people's psychological connection with their communities. Language is a strong predictor of how communities are formed. Infants preferred to take toys from people who spoke in their native rather than foreign language (Kinzler et al., 2007), while 5-6 year-olds selectively befriended peers who spoke with native accents (Kinzler et al., 2009). Social preferences based on language are so powerful that they can surpass race-based preferences, because children would choose to befriend native-accented peers regardless of their race (Kinzler et al., 2009). If people prefer to socialize with those sharing similar language backgrounds, they may also feel more connected to the community in a native language context. Combined with research demonstrating how the need to belong to a community can motivate conformity (e.g. Prewitt-Freilino et al., 2012;

Steinel et al., 2010), it is reasonable to expect that people may adhere more to social norms when placed in a native language context where there is a stronger sense of community.

The role of cultural associations

This dissertation will focus on the effect of nativeness of language on social norm adherence. This account hypothesizes that native language use encourages norm adherence, and is motivated by the expectation that native and nonnative languages bring about differences in norm accessibility, emotion, and psychological connection to the community. However, linguistic factors other than nativeness of language may also influence social norm adherence. Not only do languages differ in terms of whether they are native or foreign, they are also embedded within cultures and are associated with specific cultural rules.

The cultural account proposes that language can prime cultural mindsets. This account assumes that cultures adhere to different sets of social norms and that a particular language context triggers norms that are culturally relevant. For example, Chinese may prime collectivistic norms and prompt Chinese-English bilinguals to become more modest, while English may prime individualistic norms and prompt the same people to become more focused on individual success. When researchers randomly assigned Chinese-English bilinguals to complete an experiment in either English or Chinese, participants who used English rated themselves as better than others and distanced themselves more from outperforming others, compared to participants who used Chinese (Lee et al., 2010). This suggests that language can change the accessibility of norms related to self-enhancement.

The first distinction between the accounts is that the cultural account assumes languages prime culture-specific norms, while the nativeness account does not depend on whether norms

are tied to a specific culture. For example, the cultural account assumes that Chinese and English norms are fundamentally different, with English being more permissive about self-enhancement and Chinese encouraging more modesty. On the other hand, the nativeness account does not make any assumptions about whether Chinese and English languages are associated with different norms, but instead predicts that Chinese as a native tongue will make social norms (whatever they might be in that context) generally more relevant.

The second distinction is that unlike the nativeness account that I am proposing, the cultural associations account does not consider whether a language is native or foreign in relation to the person using the language. Hence, the accounts would make different predictions about the effect of crossing the languages. For example, the cultural account would predict that Chinese-English bilinguals and English-Chinese bilinguals would both react similarly to the Chinese language (e.g. by becoming more modest), even though Chinese is a native language for Chinese-English bilinguals and a nonnative language for the English-Chinese bilinguals. On the other hand, the nativeness account would predict that Chinese-English bilinguals would react to Chinese in the same way English-Chinese bilinguals would react to English. To sum up, the existing cultural account would make different predictions depending on which specific norms are associated with the tested languages and emphasizes the mapping between language and culture, while the nativeness account would make different predictions depending on whether the tested language is native or foreign and emphasizes the relationship between the person and the languages they speak.

My dissertation focuses on the contribution of nativeness of language, and to do so, I will compare the strength of the nativeness account with that of the cultural account in the scenarios I tested. However, this research does not aim at ruling out either account. It is likely that

nativeness and cultural associations will simultaneously impact social norm adherence through different mechanisms, and that both accounts will explain part of the variance in bilinguals' adherence to norms when using different languages. The explanatory power of each account is also likely to depend on the situation. For example, the cultural account might be more influential when cultural associations are strong, while the nativeness account would be more likely when cultural associations are weak.

Earlier findings about the relationship between native language and norm adherence

There is preliminary evidence suggesting that the nativeness of language is closely linked with social norms, but significant gaps remain. The role of nativeness of language on social norm adherence has been studied through research on bilinguals' communication of socially taboo topics. In one such study, Cantonese-English bilinguals interviewed each other about embarrassing and emotionally neutral topics. Results showed that participants spent a smaller portion of time talking about the embarrassing topics when using a native language (Cantonese), than when using a foreign language (English). According to the researchers, participants spoke for proportionally less time about embarrassing topics in a native language because a foreign language distanced bilinguals emotionally and permitted them to express taboo ideas that were otherwise too disturbing (Bond & Lai, 1986). However, speaking time is an ambiguous measure, and other interpretations are possible. Participants could have spoken longer about taboo topics in a foreign language compared to a native language not because they experienced less embarrassment, but because they felt so shameful that they had to talk around the topic, or because they had to use more words to explain themselves. Additionally, this study only recruited 48 female undergraduates from Hong Kong, raising questions about the generalizability and robustness of the effect.

Bilinguals' communication of taboo topics has also been examined through word choice in translation. To study word choice in translation, Polish-English bilinguals were asked to translate a passage containing swear words either from their native to foreign language, or from their foreign to native language. After translating the passage, the same group of participants rated the offensiveness of swear words from the source passage as well as the translated words. Results indicated that bilinguals used stronger swear words when translating ethnic slurs from their native to foreign language, while the reverse was true when the passage was translated from a foreign to a native language. This effect was not found for swear words that were not directed at social groups (Gawinkowska et al., 2013). A major limitation of this study comes from the subjective nature of the dependent variable. The results were based on a comparison between participants' own ratings of the offensiveness of source versus translated words, which may be more indicative of participants' lay theories about translation rather than objective differences between the words.

Besides communication of taboo topics, the role of language on norms has also been studied in the domain of judgments of hypothetical norm violations. In one study, Italian-German bilinguals were asked about their opinions of common violations of moral and social norms. Participants rated the severity of 15 hypothetical behaviors that ranged from lying to get a discounted fare, cutting in line, and driving out the homeless. Results showed that bilinguals were less lenient when judging hypothetical norm violations in a native language (Geipel et al., 2015a). In another study, bilinguals from different language backgrounds judged the appropriateness of utilitarian responses to moral dilemmas. For some dilemmas, the utilitarian response was a clear violation of social norms, while in other dilemmas, the utilitarian response was irrelevant to norms. While language did not affect judgments of actions that were irrelevant

to norms, foreign language use motivated bilinguals to be more supportive of norm-violating responses to moral dilemmas (Geipel et al., 2015b).

Although these results demonstrated that judgments of norm violations depended on language, the earlier studies focused on judgments of behaviors in hypothetical settings that were irrelevant to the self. Thus, the effect of language on norm adherence in actual behaviors and personal choices remains vastly under-researched. Findings based on hypothetical judgments may not generalize to actual choices, because attitudinal judgments do not always accurately predict behavior (Ajzen, 2000), and the correlation between attitudes and behaviors can be as low as -.20 (Fazio & Williams, 1986; Leippe & Elkin, 1987). Furthermore, judgments of others' norm violations may not mirror choices for the self. People may act one way and suggest another plan of action for others, because choices for the self and other prompt different considerations (Fischhoff, 1992; Kray & Gonzalez, 1999; Prentice, 1990). Self-other asymmetries in preferences have been demonstrated in medical decision-making, where people's preferences for active medical interventions, such as vaccinations, depended on whether they made the choice for themselves versus for others (Zikmund-Fisher et al., 2006). Taken together, prior findings may not generalize beyond hypothetical judgments of others' norm violating behaviors, and more research is needed to understand how nativeness of language influences norm adherence in real decisions that implicate the self.

Current research

My dissertation will evaluate the idea that adherence to social norms depends on the whether people are using a native or nonnative language. Few studies have explored this theory in a satisfying manner, either because they focused on hypothetical judgments of others' behaviors, or because there are confounding variables or compelling alternative explanations. In

this dissertation, I examine how nativeness of language motivates norm adherence for real decisions that are highly relevant for the self, including language choices for embarrassing topics (Studies 1-5) and decisions to divulge sensitive information (Studies 6-7). Studies 1-5 test whether bilinguals choose to talk about embarrassing topics (e.g. sexual topics) in a nonnative language rather than a native language, as compared to their language choices for neutral topics. Studies 6-7 test whether Mandarin-English and Hebrew-English bilinguals are more likely to divulge sensitive information when they answer intrusive questions in a native versus nonnative language.

STUDIES 1-5: BILINGUALS' LANGUAGE CHOICE FOR EMBARRASSING CONTENT

When people need to discuss taboos, they anticipate being highly embarrassed (e.g. Edelmann, 1981). Languages around the world seem to provide the same solution. They borrow words from other languages to talk about delicate topics. English speakers sometimes use French or Latin words like "derrière" and "ménage à trois," and Japanese speakers sometimes use "sekkusu," a word derives from the English word "sex", to refer to a variety of sexual terms (Larkin, 2009). Cantonese speakers frequently use English-based euphemisms to refer to condoms ("dom dom") and menstrual pads ("m 卩"), and Hebrew speakers borrow the word for vagina from Arabic.

Borrowing words from another language may protect monolinguals from feeling embarrassed when they talk about taboo topics like sex. But when people are bilinguals, they can go even further and choose between using a native and nonnative language altogether. If norms are more accessible in a native language, embarrassment may be attenuated through using a nonnative language. Hence, bilinguals may be more likely to choose a nonnative language for embarrassing topics compared to neutral topics.

This account is motivated by anecdotal evidence on emotion-related language choice suggesting that bilinguals generally prefer using a foreign language for aversive topics. For example, bilingual authors may write in a nonnative language to distance themselves from emotion (e.g. Kellman, 2000), and therapists report that bilinguals occasionally switch into a foreign tongue to discuss traumatic events (e.g. Altarriba & Santiago-Rivera, 1994; Javier, 1989). Although the earlier findings suggest that nonnative language use could be a strategy that bilinguals use to avoid negative emotion, the evidence is inconclusive due to the lack of

controlled experiments. Here we report the first experimental evidence that bilinguals choose to use a foreign language to speak about embarrassing topics.

General Method

Participants received topics or sentences that were embarrassing or emotionally neutral (Appendix A). Their task was to indicate their choice of language (either native or foreign) for reading aloud each item in front of an audience. At the end of the experiment, the experimenter informed the participant that they would not need to read aloud any items. Importantly, while reporting their language choices, participants believed that they would be reading aloud the items in the experiment, so the language choices were made in anticipation of a real interaction.

Instructions were always presented in the participants' native languages but the items to be read aloud were presented bilingually[1]. I translated and back-translated the items to ensure comparability (Brislin, 1970) and consulted bilingual native speakers of the languages used in each experiment to ensure that words and phrases conveyed the same intent across languages.

All data was collected in the lab, except for Experiment 5, which was conducted online. For the in-person experiments, participants received most instructions on a computer-based survey to minimize experimenter interaction and bias, but the experimenter was always present to answer participants' questions. In Experiment 1, experimenters ran one participant in each session. In all other in-person experiments, experimenters usually ran participants in small groups.

[1] In all experiments except Experiment 5, participants completed other unrelated tasks in the same experiment session. Some of these tasks randomly assigned participants into different language conditions. In most cases, the language conditions in other tasks did not influence the reported findings. In Experiment 2, an unexpected effect of survey language on language choice emerged, where the difference between topics assigned to English in embarrassing and neutral conditions was significantly higher when the survey was in English (11%) than when the survey was in Chinese (5%), two-sample $t(360.64) = -2.43$, $p = .02$, $d_{Cohen} = 0.24$.

Experiment 1

Experiment 1 assessed Cantonese-English bilinguals' language choices for reading aloud passages related to embarrassing versus neutral activities. Participants were given pairs of embarrassing and neutral topics and decided which topic to speak about in a native language, and which topic to speak about in a nonnative language.

Method

Participants

I conducted an a-priori power analysis using G*Power for a two-tailed one-sample Wilcoxon signed-rank test, assuming a small effect size (d = 0.20, estimated), and an alpha of .05 (Faul et al., 2007). This analysis indicated that at least 208 participants was required to achieve a minimum power of 0.8. To be conservative, I planned to collect a larger sample. In total, 385 native Cantonese speakers from Hong Kong who also spoke English participated in an in-person study. I recruited participants through a combination of methods, including emailing students and staff at a university in Hong Kong, posting on online job boards and Facebook groups or pages, and asking the research team to spread the word among their friends. Due to the sensitive nature of the experiment materials, research assistants refrained from signing up to run sessions where they knew the participant. Table B1 in Appendix B lists the characteristics of the sample in each study, including language background and gender of participants. Table C1 in Appendix C lists the eligibility criteria and justifications for participant replacements in each study.

Materials

I pretested the embarrassing and neutral topics with an independent group of 42 native Mandarin speakers[2]. The pretest participants completed the survey in either Chinese or English, where they received all instructions and topics in the randomly assigned language. In the pretest, participants rated how embarrassing it would be to describe each topic to another person in full detail (0 = *Not embarrassing*, 100 = *Most embarrassing*). Additionally, pretest participants reported if they knew the words they would need to talk about each topic in Chinese (Putonghua) and English (1 = *Definitely don't know*, 7 = *Definitely know*). Participants reported their level of vocabulary for both languages regardless of the survey language condition.

The pretest analysis was based on data from 42 participants, using their ratings on the 12 topics included in the 6 experimental topic pairs (i.e. excluding the filler items). The first goal of the pretest was to ensure that Chinese participants thought the embarrassing topics were more embarrassing then the neutral topics. To do so, I evaluated the impact of topic type and survey language on embarrassment ratings in a mixed ANOVA. Participants rated the embarrassing topics as significantly more embarrassing (M = 75.06, SD = 15.14) than the neutral topics (M = 7.57, SD = 8.25), $F(1,40) = 765.92$, $p < .001$, $\eta^2_G = .89$. There was no interaction of survey language with topic type on embarrassment ratings, $F(1,40) = 0.24$, $p = .62$, $\eta^2_G = .003$. There was also no significant main effect of survey language, $F(1,40) = 0.59$, $p = .45$, $\eta^2_G = .009$.

Vocabulary concerns could motivate language choice because bilinguals may code-switch depending on whether words are accessible in a particular language (e.g. Altarriba, 1992,

[2] We did not pretest the stimuli with Cantonese speakers because it was difficult to access Cantonese-speaking participants in Chicago. We recruited participants who reported speaking "Chinese" as their native language but excluded those who reported speaking "Cantonese" as their native language. We asked about "Chinese" generally rather than specific dialects, because it is reasonable to assume that Chinese speakers (who are not Cantonese speakers) use Mandarin (Putonghua) at a native level. We believe that the cultural norms of Mandarin and Cantonese speakers are close enough for the purposes of the pre-test.

2000). Hence, the second goal of the pretest was to evaluate participants' confidence in their vocabulary knowledge for discussing embarrassing and neutral topics in their native and nonnative languages. In the next analysis, I evaluated the impact of topic type, topic language, and survey language on vocabulary knowledge ratings in a mixed ANOVA. Although I was not primarily interested in the effect of survey language, I included the variable in my analyses to control for it. With the exception of the main effect of survey language, all other main effects and interactions were significant at $p < .05$. Most importantly, there was a significant interaction of topic language and topic type on words known, $F(1,40) = 43.37$, $p < .001$, $\eta^2_G = .08$. Participants were more confident about knowing the vocabulary in Chinese than in English for both topic types, but the difference was larger for the embarrassing items than the control items ($M_{difference}$ = 1.36 and 0.02 respectively). In other words, the relative difficulty of accessing foreign vocabulary was stronger for the embarrassing topics than the control topics. Therefore, if participants in the main experiment would make their language choices based on vocabulary, they should choose to speak about the control items (rather than the embarrassing items) in English. Notably, the vocabulary account would predict a different pattern of results compared to my primary hypothesis that participants would choose English for the embarrassing topics.

Procedure

At the beginning of the experiment, participants were told that they would read aloud two short passages that describe different activities in detail. Participants were told that they would be reading one passage in Cantonese, their native language, and another passage in English, a nonnative language, and that they would be given the opportunity to choose a language for each topic before reading aloud the passages. To indicate their language choices, participants were told that they would be shown pairs of topics, and that for each pair of topics, they had to assign

one topic for Cantonese and one topic for English. Among these pairs of topics, participants were informed that one pair would be randomly selected for them to read aloud. Participants were also informed that they would be video-recorded while they read aloud the passages, and that the video recording would be played to the next group of participants.

After receiving the instructions, participants saw seven pairs of topics one at a time in a randomized order and indicated their language choices ("Later in the video-recording, which language would you like to use to read aloud short passages related to the following activities?" Six pairs of topics were experimental pairs that were constructed with one embarrassing topic and one emotionally neutral topic (e.g. "Masturbation" and "Brushing Teeth"). The remaining pair of topics was a filler item that was constructed with two neutral topics ("Clapping Hands" and "Putting on Shoes") (For the full list, see Table A1, Appendix A). For each pair of topics, participants indicated their language choices by dragging each topic into the box on the top labeled "I wish to use English" or the box on the bottom labeled "I wish to use Chinese*"*. After choosing a language for each topic, participants described the criteria they generally used to make their language choices during the experiment in a free response question.

Results

The analysis was based on data from 385 participants. The results supported the hypothesis that participants were more likely to choose English, a nonnative language, to read aloud passages about embarrassing topics. On average, participants chose to read aloud passages related to embarrassing topics in a nonnative language for 68% (*SD* = 0.02) of the experimental topic pairs, where they had to indicate their language choices for an embarrassing topic and an emotionally neutral topic. Results from a one-sample t-test showed that for experimental topic pairs, participants were more likely than chance to select a nonnative language for embarrassing

topics, $t(384) = 10.76$, $p < .001$, $d_{Cohen} = 0.55$. Because the distribution of dependent variable was significantly different from normal ($W = 0.85$, $p < .001$), I also ran a Wilcoxon signed rank test and yielded the same conclusion, $Z = -9.36$, $p < .001$, $r = 0.48$.

Data from the filler topic pair was not included in the main analysis, because it did not contain embarrassing topics. However, an unexpected finding emerged in the pair of filler items. Although both topics were emotionally neutral, participants were still more likely to choose a nonnative language for "Clapping hands" relative to "Putting on shoes" ($M = 68\%$, $SD = 0.02$), $\chi^2(1, N = 385) = 48.75$, $p < .001$. Since the visual order of the topics was not randomized, "Clapping hands" always appeared in the same part of the computer screen as the embarrassing topic in the experimental topic pairs. I suspect that this unintended visual design flaw artificially inflated the choice for using a nonnative language for the topic "Clapping hands" in the filler item.

Qualitative Analysis

After participants indicated their choice of language for each sentence, they described the criteria they used to make these decisions in a free response question. The qualitative analysis was based on 368 participants because 17 participants did not respond to the question. Two native Mandarin Chinese speakers who were blind to the hypothesis coded the qualitative data. Before they began, the research assistants were informed about the participants' task and reviewed the stimuli. I told the research assistants that participants described the overall criteria for their choices after indicating their choice of language to read aloud each pair of sentences. I also told the research assistants that the participants were bilingual in Chinese and English, although their native language was not specified.

For each response, the research assistants reported whether the participant mentioned any concepts related to embarrassment or negative emotion, and whether the participant mentioned any concepts related to vocabulary (1 = Concept Present; 2 = Concept Absent). Note that these categories are not mutually exclusive. To help the raters understand the scope of each category, I provided words related to the two concepts and emphasized that the list was not exhaustive. Whenever these concepts were mentioned as part of their criteria for language choice, the raters specified what the preferred language was for the sentence that was embarrassing or emotionally negative, or the sentence that had difficult vocabulary (Null = Did not specify language preference; Native = Prefer native language/mother tongue; Foreign = Prefer foreign/second language; Specific = If a specific language is mentioned, write that language down). Raters also reported the keywords that indicate the presence of each concept for each response that contained the concept. To ensure that raters understood the instructions, they coded nine practice responses that were not collected from the experiment. Furthermore, each rater also received my feedback after coding 20 or 11 responses from the experiment.

I conducted a reliability analysis on the raters' reports of whether each concept was present, using only the data where neither rater received feedback from the authors (N = 337). There was almost perfect agreement between the two raters for whether the concept of embarrassment or negative emotion was present, Cohen's $\kappa = .95$, $z = 17.5$, $p < .001$, and substantial agreement on whether the concept of vocabulary was present, Cohen's $\kappa = .64$, $z = 11.8$, $p < .001$. I also conducted a reliability analysis on the raters' reports of the language preferences when the concept was mentioned. The reliability analysis was based on data where there was no feedback from the authors and where both raters thought the concept was present (N = 190 for embarrassment or negative emotion, N = 71 for vocabulary). There was excellent

agreement for both language preferences listed for embarrassment as a criterion, Cohen's κ = .81, z = 13.1, $p < .001$, and vocabulary as a criterion, Cohen's κ = .80, z = 7.86, $p < .001$[3].

After the initial round of coding that was done independently, the raters convened to resolve all the discrepancies in their reports. Using the finalized dataset with the raters' consensus, I examined how frequently participants referred to each concept as well as their language preferences for the identified concepts. 57% of participants mentioned concepts related to embarrassment or negative emotion as a criterion informing their language choices, while 26% mentioned concepts related to vocabulary. A higher proportion of participants reported using the concept of embarrassment than vocabulary as a criterion for language choice, $\chi^2(1) = 73.91$, $p < .001$.

Next, I analyzed the language preferences indicated for content that is embarrassing or difficult in terms of vocabulary. In this analysis, "Chinese" and "English" were grouped under "Native" and "Foreign" respectively for ease of interpretation. Among those who reported using embarrassment or negative emotion as a criterion ($N = 211$), the majority preferred a nonnative language to discuss embarrassing content (85%). For the remaining participants, 3% preferred a native language, and 12% did not specify a preference for either language. The probability of having a preference for a nonnative language for embarrassing content was higher than that for a native language, $\chi^2(1) = 159.05$, $p < .001$, or not specifying a preference, $\chi^2(1) = 116.25$, $p < .001$ (significance level adjusted for multiple comparisons). Among those who reported using vocabulary as a criterion ($N = 96$), 46% preferred using a native language to discuss content that has difficult vocabulary, 5% preferred a nonnative language, and 49% did not specify their

[3] I interpreted the κ values according to the guidelines from Landis & Koch (1977).

preference for either language. The probability of having a preference for a native language was higher than that for a nonnative language, $\chi^2(1) = 31.04$, $p < .001$, but not significantly different from no preference, $\chi^2(1) = 0.10$, $p = .75$ (significance level adjusted for multiple comparisons).

Next I assessed how participants' qualitative responses were related to the quantitative findings from the main task. Participants who reported using embarrassment as a criterion for language choice were more likely to assign embarrassing items to English (83%) compared to those who did not mention embarrassment (50%), $\beta = 1.22$, $SE = 0.13$, $\chi^2(1) = 92.18$, $p < .001$, $OR = 3.39$. On the other hand, participants who mentioned using vocabulary as a criterion for language choice were less likely to assign embarrassing items to English (43%) compared to those who did not mention vocabulary (78%), $\beta = -1.31$, $SE = 0.14$, $\chi^2(1) = 83.41$, $p < .001$, $OR = 0.27$. This provides strong support that participants' choice for using nonnative language for the embarrassing topic was driven by concerns about embarrassment rather than vocabulary.

Discussion

These results suggest that bilinguals chose a nonnative language over a native language to discuss embarrassing, socially taboo topics. These results cannot be explained by vocabulary knowledge. In the pretest, participants reported knowing more vocabulary in Chinese than in English generally, but the comparative difficulty of English was larger for the embarrassing items than the control items. Thus, if participants' language choices were primarily driven by vocabulary, they should have been more likely to choose a native language for the embarrassing items, which was the opposite of what I observed. The qualitative results provide further support that language choice was motivated by embarrassment rather than vocabulary concerns. More participants mentioned embarrassment or negative emotion as a criterion for language choice compared to those who mentioned vocabulary. Furthermore, those who mentioned

embarrassment were more likely to choose a nonnative language for the embarrassing topics, while those who mentioned vocabulary showed the opposite pattern.

Although the results support the hypothesis, one methodological drawback is that the procedure lacked ecological validity. In Experiment 1, bilinguals were presented with pairs of embarrassing and neutral topics and asked to assign one topic to each language. In real life, however, bilinguals can speak in each language however much they want to. There are usually no arbitrary restrictions on the number of topics that must be spoken in each language or even any requirement to use a nonnative language when speaking to another bilingual. Hence, participants' choices in Experiment 1 may be different from their language choices when communicating in real life. When these restrictions on language choice are lifted, bilinguals should choose to use a nonnative tongue less frequently overall, but it is less clear whether bilinguals would still be more likely to choose a nonnative language for embarrassing topics relative to their language choice for neutral topics. Experiment 2 was designed to address this limitation.

Experiment 2

The goal of Experiment 2 is to replicate Experiment 1 using the same language population, but with two major changes in the procedure to address the methodological limitations. Participants in Experiment 1 were required to assign one topic to each language for each pair of topics. To make the results more ecologically valid, participants in Experiment 2 were free to choose however many topics they would like to discuss in each language. This paradigm is more reflective of choices made in the real world, where restrictions are rarely placed on language choice.

Furthermore, in Experiment 1, chance (50%) was used as the baseline for comparing whether the language choices observed in the experimental topic pairs were statistically significant. However, participants also systematically chose a foreign language for one of the topics in the filler pair, where both topics are emotionally neutral. Although the unexpected results are likely attributable to an unintended visual design flaw, it still raised the question as to whether chance is an appropriate baseline for comparison, or whether a more reliable baseline needs to be established with a control condition. Thus, in Experiment 2, I included a control condition as the reference point, where language choices for embarrassing topics would be directly compared with language choices for neutral topics. I hypothesize that participants will generally choose to use a native language across topics, since that is the language that bilinguals are more familiar with. But notably, participants will choose to use a nonnative language more frequently for embarrassing topics compared to neutral topics.

Method

Participants

I conducted an a-priori power analysis using G*Power (Faul et al., 2007) for testing the difference between two dependent group means using a two-tailed Wilcoxon signed-rank test for matched pairs, assuming a small effect size (d = 0.20, estimated), and an alpha of .05. This analysis indicated that at least 208 participants was required to achieve a minimum power of 0.8. To be conservative, I recruited 400 native Cantonese speakers from Hong Kong who also spoke English to participate in an in-person study. The recruitment methods were similar to that of Experiment 1, although I also incentivized participants to refer their friends. As in Experiment 1, research assistants refrained from running participants that they know personally.

Procedure

At the start of the experiment, participants were told that they would verbally respond to fill-in-the-blank questions in front of the experimenter and other participants. Participants were told that they could answer the questions in either Cantonese, their native language, or English, a nonnative language, and that there was no restriction to the number of questions assigned to each language. Participants were also told that they would indicate their language choices for each question before answering any of them.

After understanding the procedure, participants received a list of 10 questions in a randomized order and indicated their language choices ("You can choose to use Cantonese or English to respond. Please drag each topic into the Cantonese or English box to indicate your language preference for each topic."). The questions were ostensibly randomly chosen by the computer, but in reality, all participants received five embarrassing questions related to "Sexual habits and preferences" (e.g. "When you clean your private parts, how does it feel down there?"), as well as five emotionally neutral questions related to "Common illnesses" (e.g. "Please describe all the ways heart disease could be prevented.") (See Table A2, Appendix A).

Participants were informed that when answering each question, they would receive a short paragraph with blanks that would prompt them to describe their personal experiences. Participants indicated their language choices by dragging and dropping each topic from the list of 10 into one of the two boxes[4], labeled "I would like to answer this question in English" (labeled in English) or "I would like to answer this question in Cantonese" (labeled in Chinese)

[4] Seven participants encountered a computer glitch when trying to drag and drop the neutral item "Explain the correct way of handwashing, and how handwashing can prevent the spread of diseases" and had to verbally inform the experimenter about their language preferences for that item. Of those participants, 5 informed the experimenter that they preferred Cantonese for that question, and 2 preferred English.

respectively and positioned on top of each other. The position of the two boxes was randomized across participants.

At the end of the experiment, participants completed a manipulation check. They imagined answering each question in their native language and rated how embarrassing each question would be ("Regardless of what language you chose to answer these questions on the previous page, please imagine that you have to use Cantonese to answer each question now, and then evaluate the embarrassment level of each question." 1 = Not at all embarrassing, 7 = Most embarrassing).

Results

The analysis is based on 400 participants. Figure 1 shows the average percentage of questions assigned to English, a nonnative language, for embarrassing and neutral topics respectively. Participants chose a nonnative language to respond to embarrassing questions 16% of the time, (SD = 0.02) while they chose a nonnative language to respond to neutral questions only 8% of the time (SD = 0.01), paired $t(399) = 5.74$, $p < .001$, $d_{Cohen} = 0.29$. Since the dependent variable deviated from a normal distribution ($W = 0.54$, $p < .001$), a Wilcoxon rank sum test was performed as a robustness check, which yielded the same significant difference in language choices between topic types, $Z = -2.38$, $p = .01$, $r = -.12$. Consistent with Experiment 1, Experiment 2 supports the hypothesis. People were more likely to choose a nonnative language to talk about embarrassing topics compared to neutral topics.

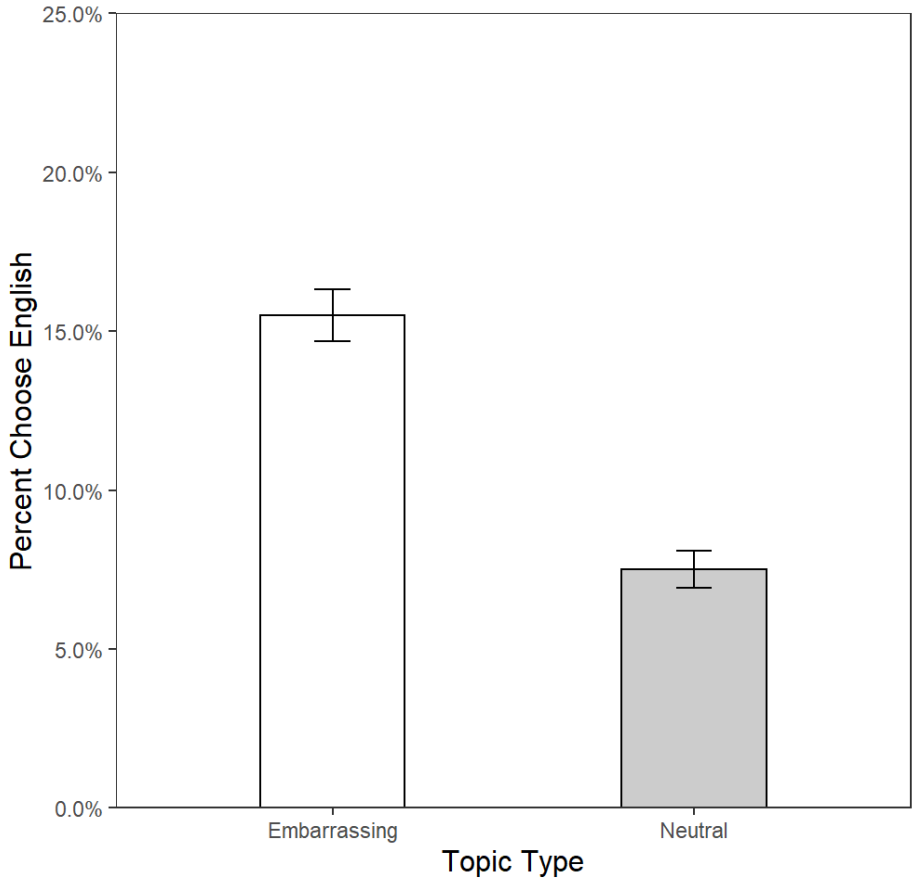

Figure 1. The average percentage of topics assigned to a nonnative language (English) for embarrassing and emotionally neutral topics in Experiment 2.

Note. Error bars represent standard errors.

As a manipulation check, participants also rated how embarrassing it would be to speak about each topic in Cantonese, their native language (1 = Not at all embarrassing, 7 = Most embarrassing). Due to a survey glitch, four participants did not complete the manipulation check, so the analysis is based on 396 participants. Participants rated embarrassing topics (M = 5.64, SD = 1.24) as more embarrassing than emotionally neutral topics (M = 1.27, SD = 0.56), paired $t(395) = 64.36$, $p < .001$, $d_{Cohen} = 3.23$.

Discussion

Although participants generally chose to use a native language across topics, participants in Experiment 2 were also more likely to choose a nonnative language for embarrassing topics compared to neutral topics. Together, Experiments 1 and 2 showed that Cantonese-English bilinguals systematically chose English, a nonnative language, to discuss embarrassing topics. The results were the same regardless of whether restrictions were placed on the number of items participants could assign for each language. The phenomenon also did not depend on whether chance or the proportion of control topics assigned to a nonnative language was used as a baseline for comparison.

Experiment 3

When bilinguals are choosing between languages to discuss embarrassing content, they may consider the differences between a native and a nonnative tongue, but they may also consider the cultural rules associated with these languages. Therefore, to understand whether bilinguals are indeed choosing a nonnative tongue to discuss embarrassing topics, it is important to evaluate the strength of the cultural explanation. Results from Experiments 1 and 2 demonstrated that Cantonese-English bilinguals systematically chose to use English to discuss embarrassing content. However, all of the embarrassing topics in Experiment 2 were about sex, while Experiment 1 also contained some sexual topics. It is possible that language choices for the sexual topics had little to do with nativeness of language, because participants might choose English simply because cultures that speak English are more permissive and open about sex than Chinese culture (e.g. Pew Research Center, 2015). Hence, as the most stringent test of the alternative account of culture, I recruited native Cantonese speakers who speak Mandarin as a foreign language in Experiment 3. If Cantonese speakers still chose to speak about embarrassing

topics in Mandarin, it is unlikely to be driven by culture because Cantonese and Mandarin should be associated with extremely similar cultures.

In Experiment 2, participants were free to choose however many topics they wanted for each language. Although the free-choice paradigm in Experiment 2 is ecologically valid, there is a risk of a floor effect. Specifically, removing restrictions on language choice may lead to participants to assign very few topics to a nonnative language. This is especially a concern for Cantonese-Mandarin bilinguals, as Mandarin is often learned as a third language, meaning they may be less proficient. To avoid potential floor effects, participants in Experiment 3 were required to assign half of the topics to each language.

Method

Participants

I preregistered the study on AsPredicted (https://aspredicted.org/blind.php?x=cc4hd6). Since the design was highly similar to Experiment 2, I consulted the same power analysis and preregistered to collect 400 participants, the same number as before. Four hundred native Cantonese speakers from Hong Kong who also spoke Mandarin participated in an in-person study. The recruitment methods were similar to that of Experiment 1, although I also incentivized participants to refer their friends. As in Experiment 1, research assistants refrained from running participants that they knew personally. The final sample size was 399, because one participant withdrew from participation.

Procedure

Similar to Experiment 2, participants were told that they would verbally respond to 10 fill-in-the-blank questions in front of the experimenter and other participants (See Table A3,

Appendix A) and were given the opportunity to indicate their language choices for each question before answering them ("What language would you like to use to respond to these questions?"). Experiment 3 followed the same procedure as Experiment 2, with a few exceptions. Here, the nonnative language being tested was Mandarin instead of English. Participants decided between using Cantonese (native) or Mandarin (nonnative) for each question.

Different from Experiment 2 where there was no restriction on language choice, participants in Experiment 3 were required to assign equal numbers of questions to each language. Because of this restriction, the number of embarrassing and neutral topics assigned to Mandarin must add up to 5 for each participant. All questions were preassigned a default language by the survey (either Cantonese or Mandarin, randomly assigned), and participants indicated their language choice for each topic by changing the default language choice for half of the questions. Participants clicked on radio buttons that corresponded to their language choices, either "I want to use Mandarin" or "I want to use Cantonese". The position of the radio buttons was randomized across participants.

Just like Experiment 2, participants also rated how embarrassing it would be to speak about each topic in Cantonese, their native language (1 = Not at all embarrassing, 7 = Most embarrassing) as a manipulation check at the end of the experiment. They were asked to disregard their previous language choices when rating how embarrassing each topic would be.

Results

The analysis is based on 399 participants. On average, the percentage of embarrassing and neutral topics that were assigned to a nonnative language (English) were both 50% (*SD* = 0.03). There was no significant difference in the number of topics that were assigned to a

nonnative language between the topic conditions, paired $t(399) = -0.29$, $p = .77$, $d_{Cohen} = 0.01$. Since the number of embarrassing topics assigned to Mandarin deviated from a normal distribution ($W = 0.91$, $p < .001$), I also ran a Wilcoxon signed rank test and found the same results, $Z = -0.33$, $p = 0.74$, $r = -0.01$.

As a manipulation check, participants rated how embarrassing it would be to speak about each topic in Cantonese, their native language (1 = Not at all embarrassing, 7 = Most embarrassing). Participants rated embarrassing topics ($M = 5.29$, $SD = 1.44$) as more embarrassing than neutral topics ($M = 1.13$, $SD = 0.42$), paired $t(398) = 54.30$, $p < .001$, $d_{Cohen} = 2.72$.

Discussion

Experiment 3 evaluated whether language choice for embarrassing topics was primarily driven by cultural rules rather than the decision between a native and nonnative language. This was motivated by Experiments 1 and 2, where native Cantonese speakers may have chosen English to discuss sexual topics not because it was a nonnative language, but because they considered English-speaking cultures to be more permissive of sex than Chinese-speaking cultures. Although the cultural account cannot account for the language choices for the embarrassing topics unrelated to sex in Experiment 1, it is a compelling explanation for Experiment 2 where all the embarrassing topics were related to sex. Therefore, in Experiment 3, I recruited Cantonese-Mandarin bilinguals whose native and nonnative languages share almost the same culture as a stringent test of the cultural account. Contrary to the results from Experiments 1 and 2 with Cantonese-English bilinguals, Cantonese-Mandarin bilinguals in Experiment 3 were just as likely to choose a nonnative language for embarrassing and emotionally neutral questions. Hence, these results are consistent with the cultural account.

Native Cantonese speakers in Experiments 1 and 2 chose English for embarrassing topics due to cultural differences in how permissible it is to talk about sex, while native Cantonese speakers in Experiment 3 did not choose Mandarin because such cultural differences do not exist.

Although the cultural account is a possible interpretation, other reasons could explain why Experiment 3 showed a different pattern of results from the first two studies. Most notably, Mandarin may not function as a true foreign language for native Cantonese speakers in the same way that English does. Both Mandarin and English are nonnative languages for native Cantonese speakers, but Mandarin is linguistically and culturally much more similar to participants' native language Cantonese. Although the spoken forms of Mandarin and Cantonese are mutually unintelligible (Tang & van Heuven, 2009), Mandarin and Cantonese share the same orthography as well as a large part of grammar, and the Chinese Academy of Social Sciences considers them to be dialects of the same language (Xing, 1991). Since participants received the questions in written form, the distinctions between Mandarin and Cantonese, which are mostly auditory, may have been quite small. Linguistic similarities aside, Mandarin and Cantonese are both closely associated with Chinese culture. In contrast to using a culturally dissimilar language like English, Mandarin may not have provided native Cantonese speakers with psychological and emotional distance that allows them to discuss taboo topics.

Methodological differences may also account for the null results in Experiment 3. Compared to the first two studies, the procedure in Experiment 3 might be more cognitively taxing, because participants had to keep track of their language choices to ensure that half of the topics had been assigned to each language. Such cognitive demands might have distracted participants from relying on subtle cues to determine their language choices, such as the degree of emotionality felt in different languages.

Due to the methodological differences as well as the similarity between Cantonese and Mandarin, Experiment 3 is not a definitive test of the alternative account about culture. Further research is needed to understand whether language choice for embarrassing topics is primarily motivated by cultural rules about particular taboos or the decision between using a native and nonnative language.

Experiment 4

So far, Experiments 1 and 2 demonstrated that Cantonese-English bilinguals systematically chose a nonnative language, English, for discussing embarrassing topics. This was not replicated in Experiment 3 with Cantonese-Mandarin bilinguals, as they did not systematically choose Mandarin for embarrassing topics. However, it is difficult to interpret the null findings from Experiment 3 due to the methodological differences that could have increased cognitive load. Mandarin is also arguably not a true foreign language for Cantonese speakers because of its cultural and linguistic similarities. Collectively, the experiments so far raise the question of whether nonnative languages are generally chosen for embarrassing discourse, or whether the effect is unique to Cantonese-English bilinguals. With these considerations in mind, Experiment 4 tested the hypothesis with a different language, by recruiting Mandarin-English bilinguals in Beijing.

The first three experiments raised a strong alternative account that bilinguals' language choices were primarily driven by cultural rules about specific taboos associated with the languages, rather than the decision between a native and foreign language. Cantonese-English bilinguals in Experiments 1 and 2 might have chosen English to speak about sexual topics simply because they perceived English-speaking cultures to be more permissive about sex than Chinese-speaking cultures (e.g. Pew Research Center, 2015), while Cantonese-Mandarin bilinguals in

Experiment 3 did not choose Mandarin as such cultural differences did not exist. Hence, to evaluate the strength of the cultural rules account, Experiment 4 tested a wider range of social taboos, as well as shifted the emphasis away from sex.

The embarrassing items in Experiment 4 involved disgusting topics (e.g. excrement, bad personal hygiene) and intrusive topics that invoked sensitive information (e.g. describing a socially inappropriate dream). Unlike sex, these embarrassing topics are not considered to be more permissible among English speakers compared to Chinese speakers. In fact, there are reasons to expect the opposite, that disgusting topics such as bathroom activities would be comparatively more acceptable in Asian cultures. For example, compared to Western cultures, excrement and defecation is more socially visible in Japan, as characterized by popular poop accessories, "poop talk" on TV, and even a toilet god in folklore. Similarly, Taipei is home to the original toilet-themed restaurant where dishes are served from mini toilet bowls and guests can order drinks such as "Bleeding Hemorrhoid Strawberry Milk" (Szczygiel, 2017, 2019). Therefore, if Mandarin-English bilinguals chose English over Mandarin to discuss disgusting and intrusive topics in Experiment 4, it would not be easily explained by cultural rules about these specific taboos.

Rules about specific taboos are not the only mechanism through which culture can motivate language choice. Culture may also influence how open people are about their private lives, so bilinguals may choose a language that encourages more self-disclosure to discuss embarrassing things about themselves. Prior studies suggests that East Asians (e.g. Japanese, Chinese) self-disclosed less compared to North Americans (Asai & Barnlund, 1998; Chen, 1995; Kito, 2005). Asians and Asian Americans were more reluctant to talk about their problems with close others in times of stress and benefitted less from seeking social support compared to

European Americans (Kim et al., 2006, 2008; Taylor et al., 2004). Similarly, field studies of online behaviors found that Twitter users in Japan were more likely to have anonymous profiles (Thomson et al., 2012). Japanese people self-disclosed less and connected with fewer people on a Japanese social networking site compared to an American social networking site (Thomson & Ito, 2012).

Although none of these studies explicitly tested the effect of language on self-disclosure, it is possible that the cultural contexts associated with languages may influence the willingness to self-disclose. In Experiments 1 and 2, Cantonese speakers may have chosen English to talk about embarrassing topics because English-speaking cultures encouraged more self-disclosure than Chinese-speaking cultures. This account would also explain why Cantonese speakers in Experiment 3 did not choose Mandarin for embarrassing topics, because the cultural norms surrounding disclosure should be similar in the two Chinese languages. To further assess this account in Experiment 4, participants would rate their perceptions about the norms of self-disclosure in Chinese-speaking and English-speaking cultures.

Beyond evaluating the cultural explanations, Experiment 4 also explored other mechanisms. It is possible that participants expect the consequences for speaking about embarrassing content to be less negative in a nonnative language than in a native language. Motivated by the existing theory that nonnative languages are emotionally muted (e.g. Harris et al., 2006), I assessed the emotional consequences that participants anticipate for using each language, focusing on the experience of discomfort. Since native languages serve as social markers (e.g. Kinzler et al., 2007), it may be reasonable to expect that people may feel more disconnected from their social environment in a nonnative language and care less about what their audience might think. Thus, I also assessed the social consequences that participants

anticipate for using each language, focusing on the expectation for negative character evaluation from others.

Aside from driving different expectations of social and emotional consequences, language may also impact how much the content to be read aloud is related to one's sense of self. People generally process self-relevant information more quickly and accurately than information that is unrelated to the self. However, people prioritized self-relevant information less when using a foreign language than when using a native language (Ivaz et al., 2016; Ivaz et al., 2019), suggesting that a nonnative language reduces the psychological importance of the self. In this experiment, I asked participants to rate how much their answers can reveal the kind of person they are and their personalities, expecting that a nonnative language may weaken the perceived relationship.

Lastly, an additional goal of Experiment 4 is to address the visual design flaw that may have biased the results from Experiment 1. In Experiment 1, participants systematically chose foreign language for one of the neutral items in the filler pair, potentially because the order of the items was not randomized. This suggests that the position of items in the visual space may have an impact on participants' reported language choice. To address the confounding effect of presentation position, Experiment 4 randomized the position of items across participants.

Method

Participants

Since the planned design and analyses was highly similar to the earlier studies, I planned for a similar sample size. I recruited 402 native Mandarin speakers from Beijing who also spoke English for an in-person study. Research assistants relied on email contact lists from the

University of Chicago Center in Beijing and a researcher at Peking University to connect them with potential participants.

Procedure

Just like the earlier experiments, participants in Experiment 4 were told that they would verbally respond to questions in front of the experimenter and possibly other participants, and were given the opportunity to decide what language to use for each item before reading their answers aloud ("What language would you like to use to read these two sentences aloud in front of other people?"). In Experiment 4, I explicitly reminded participants that the audience would be native Mandarin speakers who also spoke English. As in Experiment 1, participants in Experiment 4 received pairs of embarrassing and emotionally neutral items. Participants indicated their language choices by clicking on the items that appeared in the language they wished to respond in. For each pair of items, participants chose one item to read aloud in their native language and another item in their nonnative language.

Similar to Experiments 2 and 3, the items to be read aloud were fill-in-the-blank questions. In Experiment 4, rather than presenting just the question, the entire sentence to be read aloud was presented, reducing the ambiguity of the materials. To make the items feel more personal, participants were instructed to fill in the blank with one of the provided answer choices that best described themselves, although their selected answer choices were not recorded explicitly. Participants received 30 pairs of sentences, each containing one embarrassing sentence and one neutral sentence.

The 30 sentence pairs were divided into two sets (disgust items and intrusive items) according to the topic of the embarrassing item. The disgust and intrusive items were presented

in a blocked manner (block order was randomized). Embarrassing sentences from the disgust set asked participants to describe disgusting bodily functions and habits, such as body parts they liked to scratch and the shape of their excrement. Embarrassing sentences from the intrusive set asked participants to divulge sensitive and private information, for example, to reveal who they might have blamed for a mistake and describe a socially inappropriate dream (See Tables A4 and A5, Appendix A). I adapted stimuli from previous studies to create the intrusive items (John, Acquisti, & Loewenstein, 2009; 2011). The neutral items were emotionally neutral and matched the embarrassing sentence on length and level of vocabulary. The order of the items within the set was randomized across participants. Each pair of sentences was presented bilingually on the same page, in a 2-by-2 grid. The order of presentation of the four sentences (Native Neutral, Native Embarrassing, Nonnative Neutral, Nonnative Embarrassing) was randomized across participants.

After the main task, participants rated the consequences they anticipated if they were to read aloud the embarrassing sentences in Mandarin and English. Participants were randomly assigned to imagine reading either the disgust items, or the intrusive items. Participants then responded to four measures: two measures that assessed the emotional consequences of discomfort and negative social judgment and two measures that assessed the extent to which their answers could reveal what kind of person they are and their personality (Table 1). The measures were presented in participants' native language, while the embarrassing sentences were presented in either Mandarin or English, so that participants could better imagine reading them. For every measure, participants gave two responses, one for items in each language.

Then, participants rated the extent to which a native Chinese and English speaker would agree with statements related to habits of self-disclosure ("How much do you think a typical

native Chinese speaker and a typical native English speaker would agree with the statements below?" 1 = Strongly disagree to 7 = Strongly agree). Participants rated three statements related to disclosure adapted from previous studies (Wheeless, 1978): (1) "When I talk about my feelings, what I say is usually very brief.", (2) "I frequently reveal private things without hesitation.", (3) "I often express my personal views and opinions." The Cronbach's α for the three questions was .15 and .08 for rating a typical Chinese and typical English speaker respectively. It suggests that although the items were adapted from the same scale, it is tapping into very different facets of disclosure. Since the reliability of the scale was low, I decided not to collapse the items and to focus on the item that was most relevant for embarrassing topics (i.e. Item 2 on revealing private things).

Finally, participants also reported the language that makes them feel more like themselves ("Do you feel more like yourself when speaking in Chinese or English?" 1 = More like myself when speaking in English; 4 = No difference between the languages; 7 = More like myself when speaking in Chinese) and more emotional ("Do you feel more emotional when speaking in Chinese or English?" 1 = More emotional when speaking in English; 4 = No difference between the languages; 7 = More emotional when speaking in Chinese).

Measure	Question Text	Scale
Discomfort	To what extent does reading aloud these sentences in Chinese/English make you feel uncomfortable?	1 = *Not at all uncomfortable;* 7 = *Extremely uncomfortable*
Negative Social Judgment	When reading aloud these sentences in Chinese/ English, how negatively do you think others will evaluate your character or how cultivated you are?	1 = *Not at all negative;* *7 = Extremely negative*
Reveal Kind of Person	When reading aloud these sentences in Chinese/ English, how much can what you say reveal what kind of person you are?	1 = *Cannot reveal at all*; 7 = *Can reveal a lot*
Reveal Personality	Do you think others feel that your answers in Chinese/ English reflect your true personality?	1 = *Not at all*; 7 = *Very much so*

Table 1. Measures assessing anticipated consequences of reading aloud embarrassing items in native and nonnative languages in Experiment 4.

Results

The analysis is based on 402 participants. Participants chose a nonnative language (English) to read aloud the embarrassing item in 78% (*SD* = 0.02) of the 30 sentence pairs they reviewed, which was significantly higher than chance, one-sample $t(401) = 24.16$, $p < .001$, $d_{Cohen} = 1.21$. Because the distribution of response variable was significantly different from normal (W = 0.85 p < .001), I also ran a Wilcoxon signed rank test and found the same results, $Z = -15.05$, $p < .001$, $r = .75$.

What led participants to choose a nonnative language to read aloud embarrassing sentences? One possibility is that participants imagined the emotional and social consequences of reading aloud embarrassing sentences to be less severe in a nonnative language. Another

possibility is that participants considered embarrassing revelations in a nonnative language to be less associated with their sense of self. To evaluate these accounts, I compared the consequences that participants anticipated when they imagined reading the embarrassing sentences aloud in Mandarin and English (Table 1).

Across all four measures, participants gave higher ratings when they imagined using a native language. When participants contemplated the possibility of having to answer embarrassing questions out loud, they imagined that doing so in a nonnative language would be less uncomfortable and generate less negative social judgment. They also imagined that what they say in a nonnative language would be less reflective of who they are and their true personality (Table 2).

Measure	Disgust Item (Native)	Disgust Item (Nonnative)	Intrusive Item (Native)	Intrusive Item (Nonnative)	Language Comparison for Disgust Items (paired t)	Language Comparison for Intrusive Items (paired t)
Discomfort	6.18 (1.28)	4.44 (1.57)	5.54 (1.53)	4.32 (1.55)	$t(200) = 15.94$, $p < .001$, $d_{Cohen} = 1.12$	$t(200) = 12.61$, $p < .001$, $d_{Cohen} = 0.89$
Negative Social Judgment	4.51 (1.33)	3.83 (1.52)	4.71 (1.54)	3.84 (1.55)	$t(200) = 13.79$, $p < .001$, $d_{Cohen} = 0.97$	$t(200) = 8.87$, $p < .001$, $d_{Cohen} = 0.63$
Reveal Kind of Person	5.80 (1.92)	4.51 (1.61)	5.45 (1.80)	4.55 (1.52)	$t(200) = 5.95$, $p < .001$, $d_{Cohen} = 0.42$	$t(200) = 7.48$, $p < .001$, $d_{Cohen} = 0.53$
Reveal Personality	5.00 (1.61)	4.02 (1.53)	5.01 (1.68)	4.01 (1.53)	$t(200) = 8.60$, $p < .001$, $d_{Cohen} = 0.61$	$t(200) = 8.53$, $p < .001$, $d_{Cohen} = 0.60$

Table 2. Results from comparing the anticipated consequences of reading aloud embarrassing items in a native and nonnative language in Experiment 4.

To assess how these anticipated consequences might have driven the phenomenon, I evaluated whether these four measures were correlated with participants' language choices. Table 3 shows the correlations between language choice and the difference between ratings in a native and nonnative language. The difference is operationalized as the rating in English minus the rating in Mandarin, such that a negative score indicates that the participant gave a higher rating in a native language. Generally, the perceived differences between the experience of using a native and nonnative language is very weakly correlated with language choice, with *r* ranging from -.17 to -.24. The negative correlations suggest that the choice for using a nonnative language was weaker among participants who gave higher ratings in a nonnative compared to native language (i.e. more positive difference scores). All of the correlations were significant except for the relationship between language choice for disgust items with ratings of negative judgments and reveal kind of person.

Language difference in ratings	Item	*t*	df	*p*	*r*
Discomfort	Disgust	-3.18	199	.002	-.22
Discomfort	Intrusive	-3.27	199	.001	-.23
Negative judgments	Disgust	-1.43	199	.155	-.10
Negative judgments	Intrusive	-2.62	199	.009	-.18
Reveal kind of person	Disgust	-1.43	199	.154	-.10
Reveal kind of person	Intrusive	-3.48	199	.001	-.24
Reveal personality	Disgust	-2.46	199	.015	-.17
Reveal personality	Intrusive	-2.86	199	.005	-.20

Table 3. Correlations between language choice and difference between English and Mandarin in anticipated consequences in Experiment 4.

Next, Table 4 below shows the correlations between language choice and the ratings in a native language. Positive correlations would indicate that participants are more likely to choose a nonnative language for the embarrassing items if they anticipated more severe consequences in a

native tongue. All of the correlations were significant except for the relationship between language choice for disgust topics with ratings for reveal kind of person. Taken together, ratings in a native language were more strongly correlated with language choice (*r* ranging from .15 to .45) than the language differences in ratings. When participants are making decisions about language, they are primarily considering the consequences of speaking about embarrassing content in a native language and focusing on how to avoid that painful experience.

Native language ratings	Item	*t*	df	*p*	*r*
Discomfort	Disgust	7.12	199	<.001	.45
Discomfort	Intrusive	4.92	199	<.001	.33
Negative judgments	Disgust	4.16	199	<.001	.28
Negative judgments	Intrusive	3.70	199	<.001	.25
Reveal kind of person	Disgust	1.06	199	.292	.07
Reveal kind of person	Intrusive	3.58	199	<.001	.25
Reveal personality	Disgust	2.16	199	.032	.15
Reveal personality	Intrusive	3.41	199	.001	.24

Table 4. Correlations between language choice and anticipated consequences for using a native language in Experiment 4

Therefore, these anticipated consequences likely contributed to participants' language choices. These findings are consistent with anecdotal evidence that people choose nonnative languages for aversive topics because it gives them psychological distance (e.g. Altarriba & Santiago-Rivera, 1994; Javier, 1989). Indeed, when I asked participants to report whether they felt more emotional and like themselves when speaking in Chinese or English, I found corroborating evidence that nonnative tongues confer more psychological distance. Participants indicated that Chinese, their native language, made them feel more like themselves, one-sample $t(401) = 11.55$, $p < .001$, $d_{Cohen} = 0.58$, and more emotional, one-sample $t(401) = 12.40$, $p < .001$, $d_{Cohen} = 0.62$.

Anticipated emotional and social consequences may also help explain why participants chose a nonnative language more frequently for the disgust items compared to the intrusive items, paired $t(401) = 10.24$, $p < .001$, $d_{\text{Cohen}} = 0.51$. For disgust items, participants chose a nonnative language to read aloud the embarrassing sentence in 85% ($SD = 0.02$) of the sentence pairs, and this was significantly higher than chance, one-sample $t(401) = 28.48$, $p < .001$, $d_{Cohen} = 1.42$. For the intrusive items, participants chose a nonnative language for the embarrassing item 72% ($SD = 0.02$) of the time, and this was significantly different from chance, one-sample $t(401) = 15.2$, $p < .001$, $d_{Cohen} = 0.76$. When participants imagined reading aloud embarrassing content in their native language, they expected to experience higher discomfort and more severe social judgments for the disgust items compared to the intrusive items. These differences between item type were significant for discomfort, two-sample $t(388.58) = 4.53$, $p < .001$, $d_{Cohen} = 0.45$, and for negative social judgment, two-sample $t(392.04) = 2.46$, $p = .01$, $d_{\text{Cohen}} = 0.25$. These results suggest that stronger effect observed for disgust items might be driven by the heightened emotional and social consequences that participants anticipated.

Cultural differences in the norms about self-disclosure may also drive participants' language choices. Participants believed that native English speakers are more likely to "frequently reveal private things without hesitation" than native Chinese speakers, paired $t(401) = -2.14$, $p = .03$, $d_{Cohen} = 0.11$. Since embarrassing topics inherently involve private issues, such perceived cultural differences in self-disclosure may have encouraged participants to choose English for embarrassing discourse generally. However, just because participants perceived a difference between cultures does not mean that these perceptions drove their language choices. Next, I calculated a difference score between the perceived disclosure norm for native English speakers and that of native Chinese speakers for each participant, and correlated the perceived

cultural difference with participants' language choices. The perceived cultural differences were neither correlated with the overall number of items assigned to English, $r = .07$, $p = .135$, nor correlated with the number of disgust items assigned to English, $r = .01$, $p = .883$. On the other hand, there was a weak positive correlation between perceived cultural differences with number of moral items assigned to English, $r = .12$, $p = .020$. These correlations suggest that perceptions of the cultural differences in disclosure could not fully account for the language choices. However, these correlations are not a definitive test of whether cultural differences in disclosure could motivate language choice. Although it is a less likely account, it is possible that people do not need to be consciously aware of the cultural differences in order to conform to cultural norms and choose to disclose in English rather than Chinese.

In Experiment 1, the position of the embarrassing and neutral items was not randomized across participants. I found that participants systematically chose English for one of the neutral topics in the filler pair, suggesting that visual position of the stimuli could influence the reported language choices. Thus, in Experiment 4, I checked if the presentation order of the sentences influenced the results. All participants saw the same visual position of the items throughout the experiment, but the four possible presentation orders were randomly assigned across participants ($N = 88$; $N = 103$; $N = 103$; $N = 108$). Some participants saw the Mandarin items on top while others saw the English items on top, and some participants saw the embarrassing item on the left while others saw the neutral items on the left. The sentence positions had no significant effect on language choice.

Participants received either the disgust items first ($N = 201$) or the intrusive items first ($N = 201$). Since the embarrassing and neutral items always appeared in the same position throughout the experiment, it is possible that participants may associate the embarrassing stimuli

with a particular visual position over time. Hence, participants' language choices for the block of items that appeared first may carry over to the block of items that appeared later. The order of item type had no significant effect on overall language choice, two-sample $t(400) = 1.90$, $p = .06$, $d_{Cohen} = 0.19$, or the language choice observed in the disgust items, two-sample $t(387.89) = 1.14$, $p = .26$, $d_{Cohen} = 0.11$. However, language choice for the intrusive items was sensitive to item type order, two-sample $t(400) = 2.14$, $p = .03$, $d_{Cohen} = 0.22$, with those receiving the disgust items first assigning 6% more intrusive items to a nonnative language. These order effects suggest that part of the language choice for the intrusive items resulted from carryover effects from the disgust items. The significant order effect found for intrusive items but not disgust items also suggests that carryover effects were stronger for item types where the choice for using a nonnative language was not as pronounced.

Discussion

Experiment 4 generalized the earlier findings to a wider set of social taboos and a sample that speaks a different language. Critically, Experiment 4 provided initial evidence that the findings cannot be fully accounted by the cultural rules about specific taboos, such as how permissible it is to talk about sex in different cultures. In Experiments 1 and 2, most of the embarrassing stimuli were related to sex, and thus it is possible that participants' language choices were primarily driven by cultural norms of sexual permissibility associated with the languages. This explanation is unlikely to fully account for the findings in Experiment 4 where Chinese participants chose English for both disgusting and intrusive topics. There are no strong cultural differences in how taboo the intrusive topics are, whereas for the disgusting topics, it is reasonable to expect that Chinese culture is more accepting of discussing bathroom activities than Western cultures. However, it is still possible that cultural associations contributed to

language choice in Experiment 4. Participants perceived English speakers to be more willing to self-disclose than Chinese speakers, and the perceived cultural difference in disclosure was weakly correlated with their language choice for intrusive items. This account would be consistent with research showing that East Asians generally self-disclosed less than Americans (e.g. Kito, 2005).

Beyond evaluating the cultural accounts, Experiment 4 also demonstrated that participants expected discussing embarrassing topics in different languages to have different consequences. Participants expected that using Chinese, their native language, would be more uncomfortable, result in more negative judgment, and reveal more about their personality and who they are as a person. These expectations could potentially motivate language choice.

Experiment 5

Experiment 5 evaluated the language choices of English-Spanish bilinguals and continued to explore the underlying reasons that govern these language choices. Experiments 1 through 4 were conducted either in Beijing or Hong Kong with bilinguals who speak English as a foreign language. Notably, it remains unclear whether the observed language choices can only found among Asian participants or only among bilinguals who speak English as a nonnative tongue.

By recruiting English-Spanish bilinguals in the United States, Experiment 5 tested a few possibilities. If native English speakers in Experiment 5 chose English for embarrassing content, then it would suggest that something about the English language (such as cultural rules) encouraged people to choose it for discussing embarrassing topics. If, however, native English speakers in Experiment 5 chose Spanish for embarrassing content, then there are two additional

possibilities. First, it could support my primary hypothesis, that the phenomenon is driven by nativeness of language. That is, bilinguals generally choose a nonnative language for embarrassing content regardless of the cultural norms associated with each language. Second, the phenomenon could be driven by cultural differences in disclosure, because some studies suggest Latin Americans are quite willing to share personal information with close others (e.g. Thomson et al., 2018). This account suggests that participants would choose Spanish for embarrassing content because the associated cultural norms encourages self-disclosure.

Method

Participants

I recruited native English speakers who spoke Spanish as a second language. I preregistered the study on AsPredicted (English: https://aspredicted.org/blind.php?x=bu3yt8). I conducted an a-priori power analysis using G*Power (Faul et al., 2007) for a two-tailed one-sample Wilcoxon signed-rank test using an alpha of .05 and a minimum power of 0.8. This analysis indicated that at least 208 and 35 participants for a small effect size ($d = 0.2$) and medium effect size ($d = 0.5$) respectively. Since I expected the effect size to be between small to medium, I preregistered to collect 110 participants. I recruited 111 native English speakers from the United States who also spoke Spanish to participate in an online study. I primarily recruited University of Chicago students taking Spanish classes on campus by asking Spanish instructors to tell their students (e.g. through Canvas or email). I also reached out to Spanish departments at other U.S. universities as well as asked research assistants to spread the word online (e.g. Facebook, sorority email lists, etc.) I collected one more than the preregistered sample due to a glitch in the survey quota on Qualtrics.

Procedure

As in all other studies, participants in Experiment 5 indicated their language choices for reading aloud embarrassing and emotionally neutral sentences in front of an audience. Bilingual research assistants translated fill-in-the-blank sentences from Experiment 4 into Latin American Spanish (See Tables A6 and A7, Appendix A). Some adaptations were also made to ensure that items were culturally appropriate (e.g. “chopsticks” were changed to “forks”).

Experiment 5 generally followed the same procedure as Experiment 4. I invited participants to participate in a two-part study which involved an online survey in the first session, and a videoconference or in-person study in an ostensible second session. Participants were told that they would read aloud sentences in English and Spanish in front of the experimenter and possibly other participants in a second session. In the first session, participants reviewed these sentences and made decisions about the languages they would use to read each sentence. In reality, I was primarily interested in participants’ decisions in the first session, so the second session never took place for any participant. However, all participants were led to believe that there would be an interactive second session. Similar to all the other studies in the paper, the language choices that participants made were made in anticipation of a real interaction.

As in all other studies, Experiment 5 stated that the participants would be reading aloud items in front of the experimenter and possibly other participants. Whereas Experiment 4 explicitly reminded participants that the audience would be native Mandarin speakers who also spoke English, Experiment 5 (as well as Experiments 1, 2, and 3) did not make the language background of the audience explicit. To assess participants’ lay theories about their audience, some participants in Experiment 5 (N = 39) reported what they thought was the audience’s language background after they completed the main part of the experiment. Specifically they

were asked to select the audience's native language ("What do you think is your audience's native language"?) and the languages the audience knows ("What language(s) do you think your audience knows?").

As in Experiment 1, participants described the criteria they used to make their language choices after the main task is over. Participants then responded to four measures assessing the consequences they anticipated if they were to read aloud the embarrassing sentences, using similar measures from Experiment 4 that assessed the emotional consequences of discomfort and negative social judgment, as well as the extent to which their answers could reveal what kind of person they are and their personality (Table 5). Different from Experiment 4, participants rated both types of items for both languages in a repeated measures design. Finally, participants also responded to questions related to self-disclosure norms (Wheeless, 1987), and reported whether they felt more emotional and like themselves when speaking in English or Spanish, using the same measures from Experiment 4.

Measure	Question Text	Scale
Discomfort	To what extent does reading aloud these sentences in English/Spanish make you feel uncomfortable?	1 = *Not at all uncomfortable;* 7 = *Extremely uncomfortable*
Negative Social Judgment	When reading aloud these sentences in English/Spanish, how negatively do you think others will evaluate your character?	1 = *Not at all negative;* *7 = Extremely negative*
Reveal Kind of Person	When reading aloud these sentences in English/Spanish, how much can what you say reveal who you are as a person?	1 = *Reveals nothing*; 7 = *Reveals a lot*
Reveal Personality	Do you think others feel that your answers in English/Spanish reveal your true personality?	1 = *Not at all*; 7 = *Very much*

Table 5. Measures assessing anticipated consequences of reading aloud embarrassing items in native and nonnative languages in Experiment 5.

Results

The analysis is based on 111 native English-speaking participants. Native English-speaking participants chose Spanish to read aloud the embarrassing item in 58% (*SD* = 0.05) of the 30 sentence pairs they reviewed. Their overall choice for using a nonnative language to discuss embarrassing topics was significantly higher than chance, one-sample $t(110) = 3.33$, $p = .001$, $d_{Cohen} = 0.32$. Because the distribution of response variable was significantly different from normal ($W = 0.97$, $p = .02$), I also ran a Wilcoxon signed rank test and found the same results, $Z = -3.04$, $p = .002$, $r = .29$.

To understand the underlying reasons for the language choices, I evaluated the consequences that participants anticipated when they imagined reading the embarrassing

sentences aloud in English and Spanish (Table 3). The same pattern of results from Experiment 4 emerged. When participants contemplated the possibility of having to answer embarrassing questions out loud, they imagined that doing so in a nonnative language would be less uncomfortable and generate less negative social judgment. They also imagined that what they say in a nonnative language would be less reflective of who they are and their true personality (Table 6).

Measure	Disgust Item (Native)	Disgust Item (Nonnative)	Intrusive Item (Native)	Instrusive Item (Nonnative)	Language Comparison for Disgust Items (paired t-tests)	Language Comparison for Intrusive Items (paired t-tests)
Discomfort	5.49 (1.52)	4.23 (1.75)	4.77 (1.65)	4.04 (1.58)	$t(110) = 8.25$, $p < .001$, $d_{Cohen} = 0.78$	$t(110) = 4.94$, $p < .001$, $d_{Cohen} = 0.47$
Negative Social Judgment	5.00 (1.65)	4.23 (1.58)	4.95 (1.75)	4.32 (1.59)	$t(110) = 6.11$, $p < .001$, $d_{Cohen} = 0.58$	$t(110) = 4.34$, $p < .001$, $d_{Cohen} = 0.41$
Reveal Kind of Person	4.05 (1.81)	3.40 (1.59)	4.41 (1.77)	3.78 (1.62)	$t(110) = 4.69$, $p < .001$, $d_{Cohen} = 0.45$	$t(110) = 4.29$, $p < .001$, $d_{Cohen} = 0.41$
Reveal Personality	4.14 (1.91)	3.18 (1.67)	4.41 (1.88)	3.49 (1.65)	$t(110) = 6.51$, $p < .001$, $d_{Cohen} = 0.62$	$t(110) = 5.98$, $p < .001$, $d_{Cohen} = 0.57$

Table 6. Results from comparing the anticipated consequences of reading aloud embarrassing items in a native and nonnative language in Experiment 5.

To assess how these anticipated consequences might have driven the phenomenon, I evaluated whether these four measures were correlated with participants' language choices. Table 7 shows the correlations between language choice and the difference between ratings in a native and nonnative language. The difference is operationalized as the rating in Spanish minus the rating in English, such that a negative score indicates that the participant gave a higher rating

in a native language. None of the correlations were significant, although difference in discomfort and revealing personality was marginally and weakly correlated with language choice for intrusive items.

Language difference in ratings	Item	*t*	df	*p*	*r*
Discomfort	Disgust	-1.38	109	.169	-.13
Discomfort	Intrusive	-1.91	109	.059	-.18
Negative judgments	Disgust	-1.74	109	.084	-.16
Negative judgments	Intrusive	-1.05	109	.295	-.10
Reveal kind of person	Disgust	-1.74	109	.085	-.16
Reveal kind of person	Intrusive	-1.75	109	.083	-.17
Reveal personality	Disgust	-0.86	109	.391	-.08
Reveal personality	Intrusive	-1.97	109	.052	-.19

Table 7. Correlations between language choice and difference between Spanish and English in anticipated consequences in Experiment 5.

Next, Table 8 below shows the correlations between language choice and the ratings in a native language. Positive correlations would indicate that participants are more likely to choose a nonnative language for the embarrassing items if they anticipated more severe consequences in a native tongue. Language choices for both disgust and intrusive items were correlated with anticipated discomfort and negative judgments. Ratings of revealing kind of person and revealing personality were only correlated with language choice for intrusive items. In other words, participants who imagined disgusting and intrusive questions in English would generate more discomfort and more negative judgments were more likely to choose Spanish. Participants who imagined intrusive questions in English would reveal more about themselves were more likely to choose Spanish. Ratings in a native language were more related to language choice than the language differences in ratings. This suggests that when participants make language choices, they are primarily considering the consequences of speaking about embarrassing content in a native language and focusing on how to avoid that painful experience.

Native language ratings	Item	*t*	df	*p*	*r*
Discomfort	Disgust	2.64	109	.009	.25
Discomfort	Intrusive	3.70	109	<.001	.33
Negative judgments	Disgust	2.51	109	.013	.23
Negative judgments	Intrusive	2.09	109	.039	.20
Reveal kind of person	Disgust	0.54	109	.589	.05
Reveal kind of person	Intrusive	2.42	109	.017	.23
Reveal personality	Disgust	0.60	109	.552	.06
Reveal personality	Intrusive	3.63	109	<.001	.33

Table 8. Correlations between language choice and anticipated consequences for using a native language in Experiment 5

Hence, these anticipated consequences likely contributed to participants' choice of language. These results are consistent with the account that a nonnative language is chosen for embarrassing topics because of its psychological distance. Just as in Experiment 4, native English speakers in Experiment 5 indicated that English, their native language, made them feel more like themselves, one-sample $t(110) = 18.12$, $p < .001$, $d_{Cohen} = 1.72$, and more emotional, one-sample $t(110) = 6.97$, $p < .001$, $d_{Cohen} = 0.66$.

Native English speakers' choice for using a nonnative language was stronger for the disgust items compared to the intrusive items, paired $t(110) = 7.35$, $p < .001$, $d = 0.70$. For disgust items, participants chose a nonnative language for the embarrassing item in 66% (SD = 0.04) of the sentence pairs, and this was significantly higher than chance, $t(110) = 6.15$, $p < .001$, $d_{Cohen} = 0.58$. For the intrusive sentences, participants chose a nonnative language for the embarrassing item only 50% (SD = 0.05) of the time, and this was not significantly different from chance, $t(110) = -0.15$, $p = .88$, $d_{Cohen} = 0.01$. If bilinguals chose to discuss embarrassing content in a nonnative language because of its psychological distance, then this choice should only emerge when the items trigger strong negative emotion. Indeed, anticipated discomfort may also explain the asymmetry of language choices across types of embarrassing content. When participants imagined reading aloud embarrassing content in a native language, they expected the

disgust items to trigger more discomfort compared to the intrusive items, paired $t(110) = 4.58$ $p < .001$, $d_{Cohen} = 0.43$. Unlike Experiment 4, the difference between item type on negative social judgment was not significant, paired $t(110) = 0.29$ $p = .77$, $d_{Cohen} = 0.03$. These results suggest that stronger effect observed for disgust items could be driven by the heightened discomfort that participants anticipated.

As in Experiment 4, I evaluated whether cultural differences in the norms about self-disclosure could account for participants' language choices. Here, participants believed that Spanish speakers were marginally more likely to "frequently reveal private things without hesitation" than English speakers, paired $t(110) = -1.95$, $p = .05$, $d_{\text{Cohen}} = 0.18$. Since embarrassing topics inherently involve private issues, such perceived cultural differences in self-disclosure may have encouraged participants to choose Spanish over English for embarrassing content. Next, I evaluated whether perceived cultural differences in disclosure drove language choice. The perceived cultural differences were not correlated with the overall number of items assigned to Spanish, $r = .08$, $p = .426$, the number of disgust items assigned to Spanish, $r = .05$, $p = .611$, or the number of moral items assigned to Spanish, $r = .09$, $p = .352$. These correlations suggest that perceptions of the cultural differences in disclosure could not account for the language choices. However, it is possible that people do not have to be conscious of the cultural differences in order to act accordingly, so these correlations are not a definitive test of whether cultural differences in disclosure contributed to language choice.

As in Experiment 4, I checked if the presentation order of the sentences influenced the results. All participants saw the same visual position of the items throughout the experiment, but the four possible presentation orders were randomly assigned across participants ($N = 26$; $N = 31$; $N = 24$ $N = 30$). Some participants saw the English items on top while others saw the Spanish

items on top, and some participants saw the embarrassing item on the left while others saw the neutral items on the left. The sentence positions had no significant effect on language choice.

Participants were also randomly assigned to receive either the disgust items first (N = 55) or the intrusive items first (N = 56). Since the embarrassing and neutral items always appeared in the same position throughout the experiment, it is possible that participants may associate the embarrassing stimuli with a particular visual position over time. Hence, participants' language choices for the block of items that appeared first may carry over to the block of items that appeared later. The order of item type had a significant effect on overall language choice, two-sample $t(109) = 2.30$ $p = .02$, $d_{\text{Cohen}} = 0.44$ and the language choice observed in the intrusive items, two-sample $t(109) = 2.45$, $p = .02$, $d_{\text{Cohen}} = 0.47$. When the disgust items appeared first, the percentage of embarrassing topics assigned to a nonnative language was 11% higher overall, and 12% higher for the intrusive items. These order effects suggest that part of the language choices for the intrusive items resulted from choices carried over from the disgust items. However, language choice for the disgust items was insensitive to item type order, two-sample $t(109) = 1.70$, $p = .09$, $d_{\text{Cohen}} = 0.32$. The results show that there were carryover effects between item types generally and that this was primarily driven by the order effect on intrusive items, suggesting that carryover effects were stronger for item types where the language choices were not as pronounced at baseline.

As a manipulation check, I asked some participants to identify the language background of the audience. Of the 39 native English speakers who received the manipulation check, everyone correctly identified both English and Spanish to be languages that the audience knows. Most participants thought that the native language of the audience was English, although 6 participants thought their native language would be Spanish.

Qualitative Analysis

After participants indicated their choice of language for each sentence, they described the criteria they used to make these decisions in a free response question. After data collection was complete, two native English speakers who were blind to the hypothesis coded the qualitative data. Before they began, the research assistants reviewed the participants' task and the stimuli. I told the research assistants that participants described the overall criteria for their choices after indicating their choice of language to read aloud each pair of sentences. I also told the research assistants that the participants were bilingual in English and Spanish, although their native language was not specified.

For each response, the research assistants reported whether the participant mentioned any concepts related to embarrassment or negative emotion, and whether the participant mentioned any concepts related to vocabulary (1 = Concept Present; 2 = Concept Absent). Note that these categories are not mutually exclusive. To help the raters understand the scope of each category, I provided words related to the two concepts and emphasized that the list was not exhaustive. Whenever these concepts were mentioned as part of their criteria for language choice, the raters specified what the preferred language was for the sentence that was embarrassing or emotionally negative, or the sentence that had difficult vocabulary (Null = Did not specify language preference; Native = Prefer native language/mother tongue; Foreign = Prefer foreign/second language; Specific = If a specific language is mentioned, write that language down). Raters also reported the keywords that indicate the presence of each concept for each response that contained the concept. To ensure that raters understood the instructions, they coded nine practice responses that were not collected from the experiment. Each rater also received my feedback after coding 10 or 13 responses from the experiment.

I conducted a reliability analysis on the raters' reports of whether each concept was present, using only the data where neither rater received feedback from the authors (N = 98). There was excellent agreement between the two raters for whether the concept of embarrassment or negative emotion was present, Cohen's $\kappa = .82$, $z = 8.10$, $p < .001$, and whether the concept of vocabulary was present, Cohen's $\kappa = .87$, $z = 8.68$, $p < .001$. I also conducted a reliability analysis on the raters' reports of the language preferences when the concept was mentioned. The reliability analysis was based on data where there was no feedback from the authors and where both raters thought the concept was present (N = 74 for embarrassment or negative emotion, N = 37 for vocabulary). There was excellent agreement for both language preferences listed for embarrassing sentences, Cohen's $\kappa = .73$, $z = 7.64$, $p < .001$, and vocabulary, Cohen's $\kappa = .67$, $z = 4.33$, $p < .001$[5].

After the initial round of coding that was done independently, the raters convened to resolve any discrepancies in their reports. Using the finalized dataset with the raters' consensus, we examined how frequently participants referred to each concept as well as their language preferences for the identified concepts. 82% of participants mentioned concepts related to embarrassment or negative emotion as a criterion informing their language choices, while 43% mentioned concepts related to vocabulary. A higher proportion of participants reported using the concept of embarrassment than vocabulary as a criterion for language choice, $\chi^2(1) = 35.58$, $p < .001$.

Next, I analyzed the language preferences indicated for content that is embarrassing or difficult in terms of vocabulary. In this analysis, "English" and "Spanish" are grouped under

[5] I interpreted the κ values according to the guidelines from Landis & Koch (1977).

"Native" and "Foreign" respectively for ease of interpretation. Among those who reported using embarrassment or negative emotion as a criterion (N = 91), 60% preferred a nonnative language to discuss embarrassing content, 8% preferred a native language, and 32% did not specify a preference for either language. The probability of having a preference for a nonnative language for embarrassing content was higher than that for a native language, $\chi^2(1) = 37.16$, $p < .001$, or not specifying a preference, $\chi^2(1) = 8.05$, $p = .005$ (significance level adjusted for multiple comparisons). Among those who reported using vocabulary as a criterion (N = 48), 63% preferred using a native language to discuss content that has difficult vocabulary, 0% preferred a nonnative language, and 38% did not specify their preference for either language. The probability of preferring a nonnative language was not significantly different from not specifying a preference, $\chi^2(1) = 3$, $p = .08$.

Next I assessed how participants' qualitative responses were related to the quantitative findings from the main task. Overall, participants who reported using embarrassment as a criterion for language choice were more likely to assign embarrassing items to Spanish (62%) compared to those who did not mention embarrassment (39%), $\beta = 0.64$, $SE = 0.17$, $\chi^2(1) = 14.10$, $p < .001$, $OR = 1.90$. On the other hand, participants who mentioned using vocabulary as a criterion were less likely to assign embarrassing items to Spanish (47%) compared to those who did not mention vocabulary (66%), $\beta = -0.53$, $SE = 0.13$, $\chi^2(1) = 15.88$, $p < .001$, $OR = 0.59$.

The results were similar for language choices assigned to disgust and intrusive items. Participants who reported using embarrassment as a criterion were more likely to assign disgust items to Spanish (71%) compared to those who did not mention embarrassment (45%), $\beta = 0.77$, $SE = 0.21$, $\chi^2(1) = 13.77$, $p < .001$, $OR = 2.16$. Participants who reported using embarrassment as a criterion were also more likely to assign intrusive items to Spanish (53%) compared to those

who did not mention embarrassment (33%), $\beta = 0.57$, $SE = 0.19$, $\chi^2(1) = 9.19$, $p = .002$, $OR = 1.76$.

On the other hand, participants who reported using vocabulary as a criterion were less likely to assign disgust items to Spanish (55%) compared to those who did not mention vocabulary (74%), $\beta = -0.64$, $SE = 0.16$, $\chi^2(1) = 15.28$, $p < .001$, $OR = 0.53$. Participants who reported using vocabulary as a criterion were also less likely to assign intrusive items to Spanish (40%) compared to those who did not mention vocabulary (57%), $\beta = -0.48$, $SE = 0.14$, $\chi^2(1) = 10.91$, $p < .001$, $OR = 0.62$. Together, these results demonstrate that participants' choice for using a nonnative language for the embarrassing topic was driven by concerns about embarrassment rather than vocabulary.

Discussion

In Experiment 5, English-Spanish bilinguals systematically chose a nonnative language when answering disgusting and intrusive questions. Experiment 5 addressed the limitations of the earlier experiments. Most importantly, Experiment 5 recruited English-Spanish bilinguals because it was unclear from the earlier experiments whether the phenomenon could only be found among native Chinese speakers or among foreign speakers of English. By generalizing the findings to native English speakers, Experiment 5 provided stronger evidence that language choices for embarrassing topics were not driven by idiosyncratic differences between Chinese and English or anything special about English.

Cultural associations about particular taboos also cannot account for the phenomenon. Bilinguals' language choices across the experiments were similar for a range of embarrassing content that included sexual taboos, disgusting bodily functions, and sensitive, private

revelations. The observed language choices could not be attributed to specific cultural taboos because of the variety of taboos tested across experiments. Furthermore, in Experiment 4, Chinese participants actually chose the language that is less permissive of toilet taboos (English) to discuss items about bathroom activities.

Just like in Experiment 1, Experiment 5 demonstrates that the language choices cannot be explained by vocabulary concerns. The qualitative analysis from Experiment 5 yielded a highly similar pattern of results as Experiment 1, which is remarkable given the differences in embarrassing topics and the languages between the experiments. More participants mentioned embarrassment or negative emotion as a criterion for language choice than vocabulary. Additionally, those who mentioned embarrassment were more likely to choose a nonnative language for the embarrassing topics, while those who mentioned vocabulary showed the opposite pattern. This was true for both disgust and intrusive items.

What can explain bilinguals' language choices for embarrassing topics then? There are two remaining accounts that could both contribute to the phenomenon. The first account is my primary hypothesis, which is that participants considered the differences between using a native and nonnative language. Using a nonnative language offered psychological distance from the aversive items, allowing participants to anticipate less embarrassment. The second account is that participants chose languages that are associated with cultures that encouraged self-disclosure for embarrassing content. In other words, native Chinese speakers chose English for the embarrassing items because English is associated with a more open culture. Similarly, native English speakers could choose Spanish because Spanish is associated with a more open culture. More work is needed to compare these accounts more definitively. Regardless of whether nativeness or self-disclosure norms contributed more to language choice, participants expected

reading aloud embarrassing items in English (Experiment 5) and Chinese (Experiment 4) to be more uncomfortable, generate more negative judgments, and reveal more about themselves. These expectations likely contributed to their language decisions and motivated participants to choose a nonnative language.

Aside from demonstrating the general phenomenon and exploring potential mechanisms, I also discovered a possible boundary condition. Experiment 3 showed that the similarity between native and nonnative languages could be a potential moderator, because Cantonese-Mandarin bilinguals did not show the same effect. Together, these experiments deepened our understanding of bilinguals' language choice for embarrassing topics and informed the broader inquiry about the relationship between language and norms.

STUDIES 6-7: THE EFFECT OF NATIVENESS OF LANGUAGE ON DIVULGING SENSITIVE INFORMATION

In the first five experiments, I examined the effect of embarrassment of the content to be spoken on bilinguals' language choice. While the first five studies assessed bilinguals' decision between using a native and nonnative language to speak about topics that violate social norms, the next two studies evaluated how the use of a native versus nonnative language impacts norm-violation. Specifically, Experiments 6 and 7 examined how language influenced bilinguals' decision to divulge sensitive information about their own norm-violating behaviors.

Decisions to divulge sensitive information depend on privacy concerns. In other words, people may deny that they have engaged in sensitive behaviors if they feel concerned about privacy. The perceived significance of privacy concerns and likelihood of divulging has been found to depend on the situation. When people are uncertain about the value they place on privacy, they may resolve the uncertainty by relying on contextual cues. Ironically, contextual cues may not always be helpful, because cues that reduce privacy concerns are at times unrelated or even positively correlated to the objective hazards of disclosure. For example, even though a website that looks unprofessional should be less likely to offer privacy protection compared to reputable platforms (e.g. Cranor, 2002), unprofessional websites suppressed privacy concerns and facilitated disclosure. In another experiment, the effect of confidentiality assurances on disclosure to questions about academic integrity breaches depended on whether privacy concerns were top of mind. Notably, when people were warned about the sensitive nature of the questions through a consent notice, confidentiality assurances backfired and reduced the likelihood of divulging. Furthermore, people were more likely to divulge sensitive information when asked

indirectly compared to directly, even though the inquiry method should not indicative of the objective dangers of disclosure (John, Acquisti, & Loewenstein, 2009; 2011).

In Experiments 6 and 7, I examined the role of nativeness of language as a contextual cue that could influence the likelihood of disclosing norm-violating behaviors. Bilingual participants were randomly assigned to answer intrusive questions that elicited sensitive self-relevant information in either their native or nonnative language. Similar to contextual cues such as a website that looks unprofessional and indirect questioning, I expected a nonnative language context to increase the likelihood of divulging sensitive, personally relevant information. This account is motivated by prior research showing that bilinguals were more lenient when judging hypothetical norm violations (e.g. lying to get a discounted fare) in a nonnative language (e.g. Geipel et al., 2015a). The attenuated severity of judgments suggests that people may also feel more comfortable disclosing their own norm-violating behaviors in a nonnative language. This is because when norm violations are judged to be less severe, the risk of stigma and potential reputation costs could be reduced, and this reduces concerns about privacy and removes the barrier to disclosing sensitive information. In studies about seropositive adults' decisions to disclose their HIV status, for example, beliefs about whether HIV is stigmatized by the public was positively correlated with endorsements of reasons to conceal one's HIV status (e.g. Leary & Schreindorfer, 1998). Thus, through attenuating the severity of moral judgments, nonnative languages could potentially increase the likelihood of divulging.

In Experiments 6 and 7, I randomly assigned bilingual participants to participate in an ethical judgment task in either their native or foreign language. Modeling after the procedure of John et al. (2011), I presented participants with indirect questions that probed whether they had personally engaged with different behaviors, half of which were norm-violating behaviors that

were potentially incriminating (e.g. making up a serious excuse), and half of which were control behaviors that do not carry the same reputational costs (e.g. traveling outside of the country). I expected that using a nonnative language would encourage bilinguals to divulge more information in response to intrusive questions about norm-violating behaviors, but would not have any effect on control questions. Consistent with the first five studies on bilinguals' language choice, I expected Experiments 6 and 7 to support the general account that norm adherence depends on whether people are using a native or nonnative language.

Experiment 6

Experiment 6 examined whether nativeness of language influenced likelihood of divulging sensitive information about their own norm-violating behaviors. Participants were randomly assigned to participate in an ethical judgment task in either their native or nonnative language and were indirectly asked to report if they had previously engaged with sensitive and control behaviors. If the norm adherence is associated with a native tongue, then participants should be more likely to divulge sensitive information about their own norm violations when using a nonnative language. Furthermore, language should not have any effect on divulging control behaviors that are unrelated to norm violations.

Method

Participants

Four hundred and ten Mandarin Chinese-English bilinguals were recruited to participate in an in-person study in Beijing. The sample size for a 2 (within) x 2 (between) mixed ANOVA was estimated using G*Power. For a small effect ($f = 0.10$), a sample size of at least 200 was needed to achieve a minimum power of 0.8. To be conservative, I planned to collect a larger

sample. Research assistants recruited participants primarily through the University of Chicago Center in Beijing email contact list as well as their personal connections.

Procedure

Participants were randomly assigned to complete the experiment in Mandarin Chinese (native language) or English (foreign language). With the exception of four participants, all procedures and materials, including interactions with the experimenter, consent procedures, and study materials that preceded the current experiment, were presented to participants in the assigned language. Due to a computer glitch, four participants were exposed to a different language in the consent and preceding study materials before starting the experiment in the assigned language. All materials used in the experiment were backtranslated to ensure comparability and accuracy (Brislin, 1970).

Participants were told that they would assess how ethical different behaviors are, as well as report whether they have done the behaviors. They were informed that research has shown that ethical judgments are influenced by prior engagement in the behaviors. For each behavior, participants rated the ethicality of the behavior using 6-point scale that included the following options: *Not unethical, Somewhat unethical, Quite unethical, Extremely unethical, It depends on the situation, Nothing to do with ethics*. Additionally, the scale contained two columns, one of which indicated they have done the behavior, while the other one indicated they have not done the behavior. Hence, by placing their ethicality rating in one of the two columns, participants indirectly reported whether they have done each behavior. Rather than asking participants about their engagement with the behaviors directly, I borrowed this indirect questioning method from John et al. (2011) in an effort to increase the overall likelihood of divulging and reduce the risk

of running into floor effects. Figure 2 shows the scale that participants responded to for each behavior.

	If you have done this behavior, how unethical do you think this is?	If you have not done this behavior, how unethical do you think this is?
Not unethical	☐	☐
Somewhat unethical	☐	☐
Quite unethical	☐	☐
Extremely unethical	☐	☐
It depends on the situation	☐	☐
Nothing to do with ethics	☐	☐

Figure 2. Ethical judgment task in Experiment 6.

Note. Participants indirectly reported whether they have done each behavior by placing their ethicality rating in the column with the corresponding header.

Participants responded to 20 behaviors, half of which were sensitive behaviors, some of which were morally questionable (e.g. faking someone's signature), and half of which were control behaviors that were not sensitive (e.g. running a marathon) (See Table A8 in Appendix A for the full list). The sensitive behaviors were adapted from previous research (John et al., 2009, 2011). The items were selected from a larger set of items, based on results from two pretests

conducted in English on Amazon Mechanical Turk (N = 98 and N = 107). The percentage of participants who reported having done each pretested behavior can be found in Tables D1 and D2 in Appendix D. The finalized list of items were selected based on the following criteria. First, a range of divulging rates was represented, but items in the extreme ends were avoided (i.e. very rare or very common behaviors). Second, divulging rates on the sensitive and control behaviors were matched as best as possible. Third, items that the research team thought may have strong cultural differences in prevalence were avoided (e.g. sexual behaviors).

Results

The analysis included 410 participants, with 209 participants randomly assigned to completing the experiment in Mandarin Chinese (native language), and the remaining 201 participants randomly assigned to completing the experiment in English (foreign language). Figure 3 shows the average percentage of sensitive and control behaviors that participants reported having done, when they were asked in Chinese or English.

The results support the hypothesis that foreign language use led participants to divulge more sensitive behaviors. I ran a generalized linear mixed model with divulging (report having done a behavior or not) as the response variable. Language (native Mandarin or foreign English) and behavior type (sensitive or control) were entered as fixed factors. Participant (1-410) and question (1-20) number were entered as random factors. Wald tests were used to provide estimates of the p-values for each individual parameter. There was a significant main effect of language on divulging, such that participants were less likely to indirectly report having done a behavior in a native language (33%) than foreign language (38%), Z = -2.45, $p < .05$; β = -0.15, SE= 0.06. There was also a significant main effect of behavior type on divulging, such that people were less likely to report having done control behaviors (29%) rather than sensitive

behaviors (42%), $Z = 2.12$, $p < .05$; $\beta = 0.37$, $SE = 0.17$. Most importantly, there was a significant interaction between language and behavior type, $Z = -4.69$, $p < .001$; $\beta = -0.13$, $SE = 0.03$. People in the foreign language condition divulged sensitive behaviors 10% more often than those in the native language condition. Conversely, there was only a 1 percentage point difference between language conditions for the divulging of control behaviors.

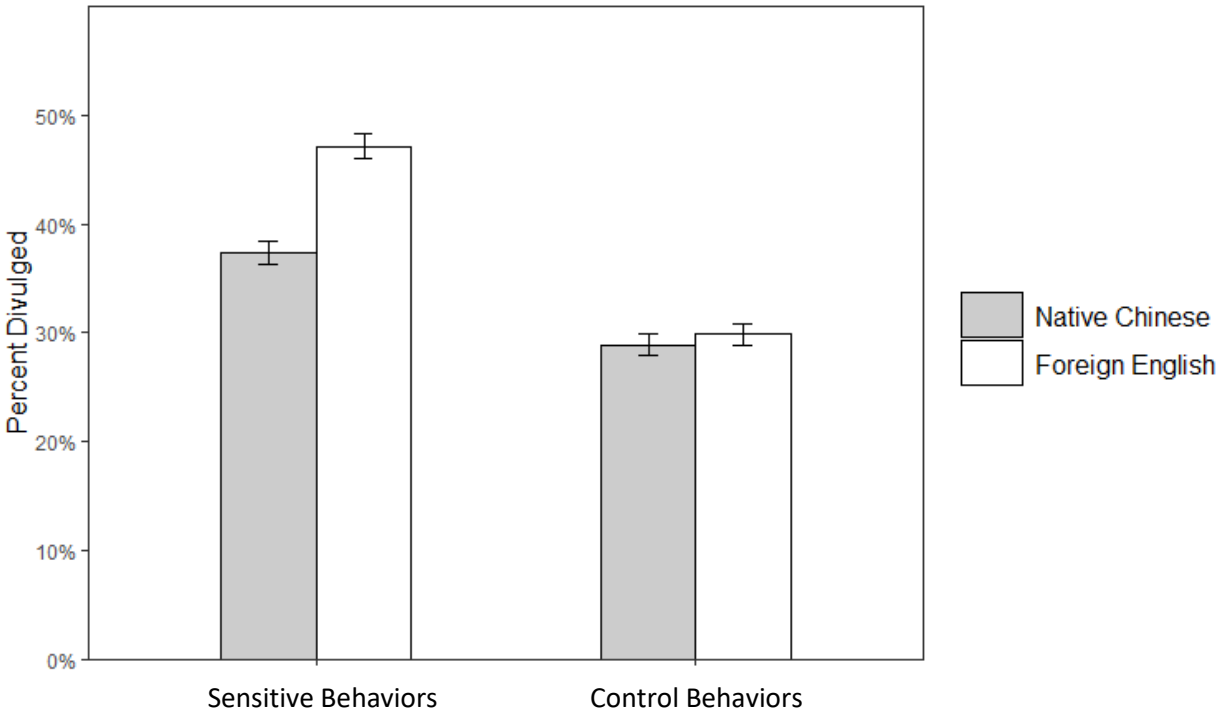

Figure 3. Average percentage of participants in Experiment 6 who reported having done sensitive and control behaviors in each language condition.

Note. Error bars represent standard errors.

Figure 4 and 5 shows the distribution of ethicality ratings chosen by the participants for the sensitive and control items respectively. The graph descriptively indicates that a much larger proportion of ethicality ratings fell into the "Nothing to do with ethics" category for control items compared to the sensitive items. This indicates that the manipulation of item type was

successful, because participants were identified the differences in ethicality between the control items and the sensitive items that were related to norm violations. The language effects on ethicality ratings are more difficult to observe based on the graphs. Compared to participants using English, participants using Chinese seemed to be more likely to indicate that control behaviors had "Nothing to do with ethics". Because the scale is not continuous, it was not possible to conduct further confirmatory analyses on the moral ratings.

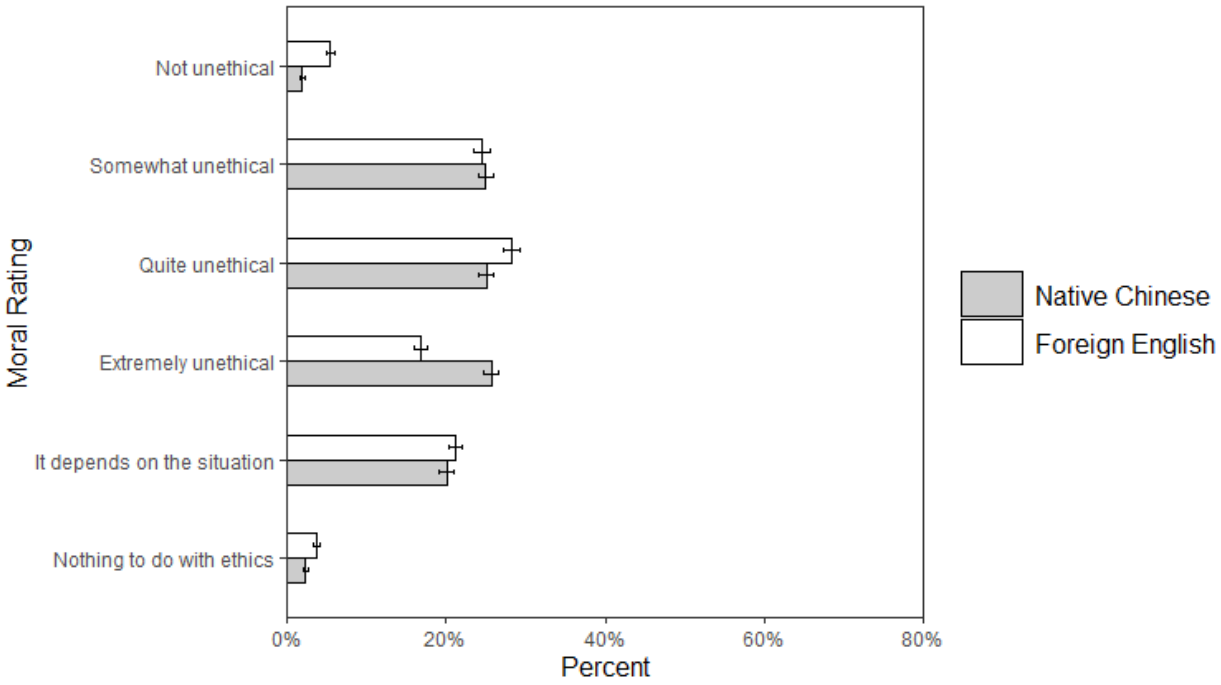

Figure 4. Distribution of ethicality ratings for the sensitive behaviors in Experiment 6.

Note. Error bars represent standard errors.

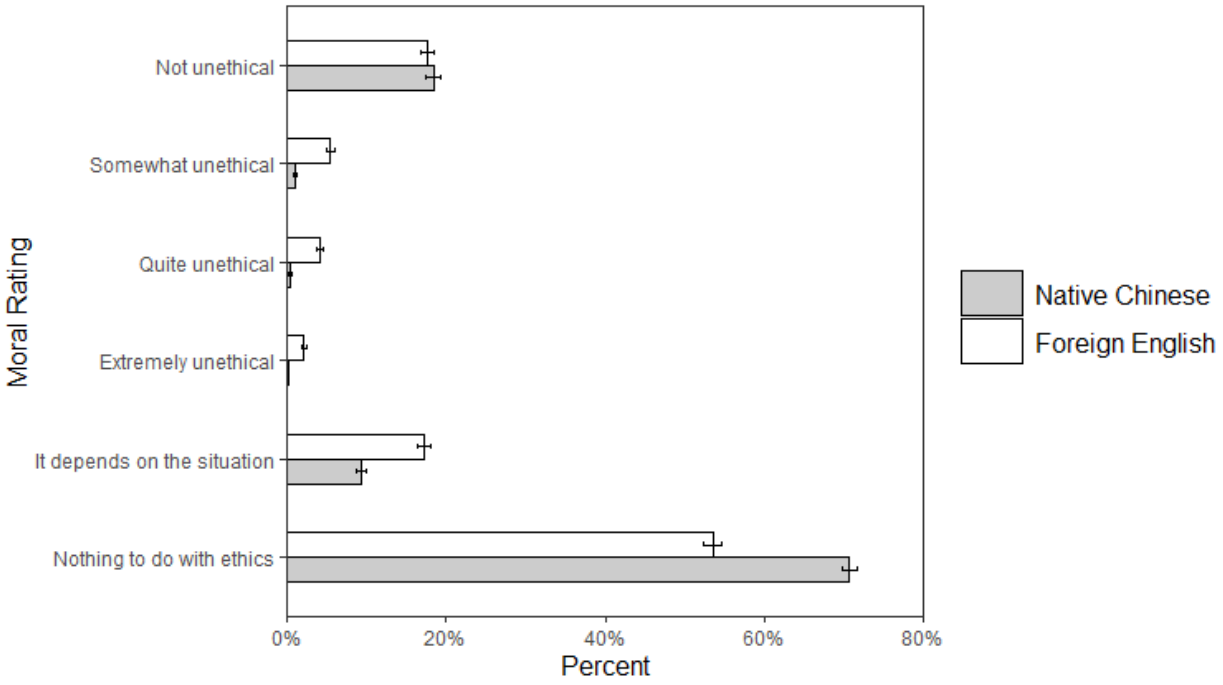

Figure 5. Distribution of ethicality ratings for the control behaviors in Experiment 6.

Note. Error bars represent standard errors.

Discussion

Experiment 6 supported the account that bilinguals were more likely to divulge sensitive information when using a nonnative language, and that language had no effect on divulging neutral information. Although Experiment 6 was informative, there were several limitations. First, the ethicality ratings were difficult to interpret because the scale was not fully continuous. It was not possible to quantify the impact of language on perceived ethicality of the items. Second, the position of the columns of the ethicality rating scales was not randomized, and the "have done" column was always positioned closer to the scale anchors. Although this is an unlikely account, it is possible that participants might default to using the "have done" column because of its convenient and prominent position, especially when using a nonnative language that increases cognitive load. Furthermore, the control items were typically shorter in length than

the sensitive items and introduces a confound. It is possible that the sensitive items were more difficult to comprehend, especially in a nonnative language. Experiment 7 was designed to address these concerns.

Experiment 7

Experiment 7 was designed to replicate the findings from Experiment 6 with different languages and cultures. To increase the generalizability of the phenomenon, an Israeli sample was chosen because many of the experiments so far have exclusively studied native Chinese speakers. Similar to Experiment 6, Hebrew-English bilinguals in Experiment 7 completed an ethical judgment task in either their native or nonnative language, and I examined whether language influenced their likelihood to divulge sensitive information. The study was preregistered on AsPredicted.org (https://aspredicted.org/blind.php?x=ji6sx5).

Method

Participants

175 Hebrew-English bilinguals in Israel were recruited to participate in an online study. Assuming the same effect size observed in Experiment 6 (f = 0.17), a sample size of at least 75 was needed to achieve a minimum power of 0.8. To be conservative, I preregistered to collect a larger sample (http://aspredicted.org/blind.php?x=ji6sx5). The study team recruited participants from universities in Israel.

Procedure

Participants in Experiment 7 completed the same ethical judgment task as Experiment 6. They were randomly assigned to complete the entire experiment in either Hebrew (native

language) or English (foreign language). As in Experiment 6, all materials were back-translated to ensure comparability (Brislin, 1970). Participants rated the ethicality of 20 behaviors that were adapted from Experiment 7, half of which are sensitive and half of which are control behaviors (See Table 1 in the Appendix for the full list). Simultaneously, participants indicated whether they have done those behaviors by placing their rating in the corresponding column.

Experiment 7 addressed several issues in Experiment 6. In Experiment 6, the ratings were difficult to interpret because the scale was not fully continuous. Participants in Experiment 7 received a moral rating scale that was continuous, with the scale anchors ranging from 1 (*No ethical problem*) to 7 (*Serious ethical problem)*. Another difference was that the position of the column that indicated prior engagement with a behavior was randomized across participants in Experiment 6. Since the "have done" column was positioned closer to the scale anchors, it is possible that when participants were unsure of which column to use they would default to the column that is placed in the more convenient and prominent position. Another potential issue in Experiment 6 was that the control items were typically shorter in length than the sensitive items, and Experiment 7 corrected this confound. To ensure participants fully understood the materials in a foreign language, Experiment 7 also added a translation task at the end that assessed participants' understanding of the items by asking participants to select the correct translation of each item after the main task. Figure 6 shows the ethical judgment task that participants completed for each behavior.

	Use this column if you **have** done this	Use this column if you **have not** done this
1 – No ethical problem	☐	☐
2	☐	☐
3	☐	☐
4	☐	☐
5	☐	☐
6	☐	☐
7 – Serious ethical problem	☐	☐

Figure 6. Ethical judgment task in Experiment 7.

Note. Participants indirectly reported whether they have done each behavior by placing their ethicality rating in the column with the corresponding header.

Results

The analysis included 175 participants, with 80 participants randomly assigned to completing the experiment in Hebrew (native language), and the remaining 95 participants randomly assigned to completing the experiment in English (foreign language). Figure 7 shows the average percentage of sensitive and control behaviors that participants reported having done, when they were asked in Hebrew or English.

Recall that in Experiment 6, foreign language use led participants to divulge more sensitive behaviors. These results were not replicated in Experiment 7. I ran a generalized linear mixed model with divulging (report having done a behavior or not) as the response variable. Language (native Hebrew or foreign English) and behavior type (sensitive or control) were

entered as fixed factors. Participant (1-175) and question (1-20) number were entered as random factors. Wald tests were used to provide estimates of the p-values for each individual parameter. There was no significant main effect of language on divulging. Participants were just as likely to report having done a behavior in a foreign language (43%) or in a native language (44%), Z = -0.67, p = .50; β = -0.03, SE = 0.05. There was also no significant main effect of behavior type on divulging, such that people were just as likely to indirectly report having done control behaviors (41%) and sensitive behaviors (47%), Z = -0.63, p = .53; β = -0.14, SE = 0.23. There was no significant interaction between language and behavior type, Z = -0.53, p = .60; β = -0.02, SE = 0.04. For control behaviors, there was a 2 percentage point difference in divulging rates between language conditions, whereas for sensitive behaviors, the difference was 1 percentage point. Participants' accuracy on the translation task was 98%. Analyzing the data with only responses where the participants correctly translated the behaviors did not change the pattern of results.

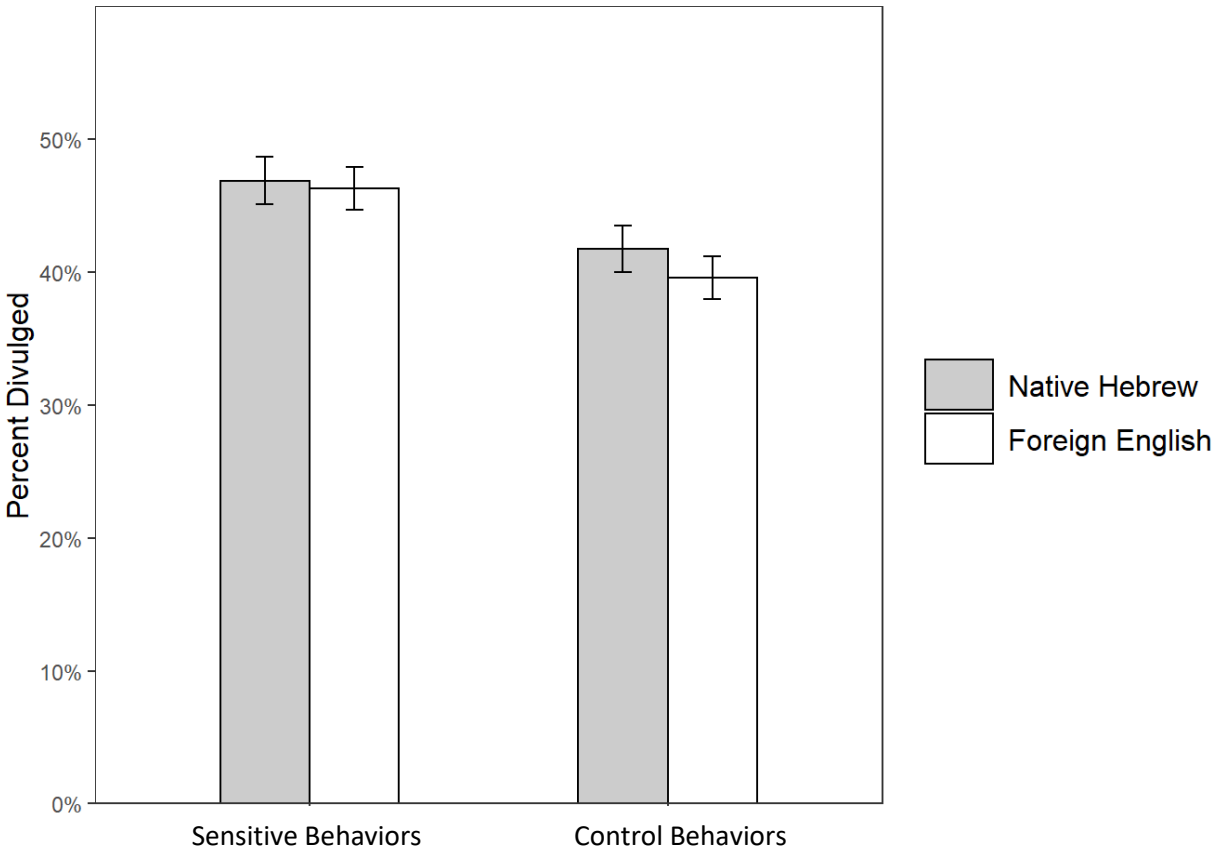

Figure 7. Average percentage of participants in Experiment 7 who reported having done sensitive and control behaviors in each language condition.

Note. Error bars represent standard errors.

Figure 8 shows the average ethicality ratings given to sensitive and control items by participants in different language conditions. As a manipulation check, participants rated sensitive behaviors (5.04) as more unethical than control behaviors (1.26), $t(0.2) = -16.85$, $p < .001$; $\beta = -1.89$, $SE = 0.11$. Participants gave similar moral ratings regardless of language condition, with the mean being 3.16 in English and 3.14 in Hebrew, $t(0.17) = 0.32$, $p = 0.75$; $\beta = 0.01$, $SE = 0.04$. There was no interaction of language and behavior type on the moral ratings, $t(0.003) = 0.45$, $p = 0.65$; $\beta = 0.01$, $SE = 0.02$. Sensitive and control behaviors were rated 0.01 and 0.04 points higher in the English condition respectively.

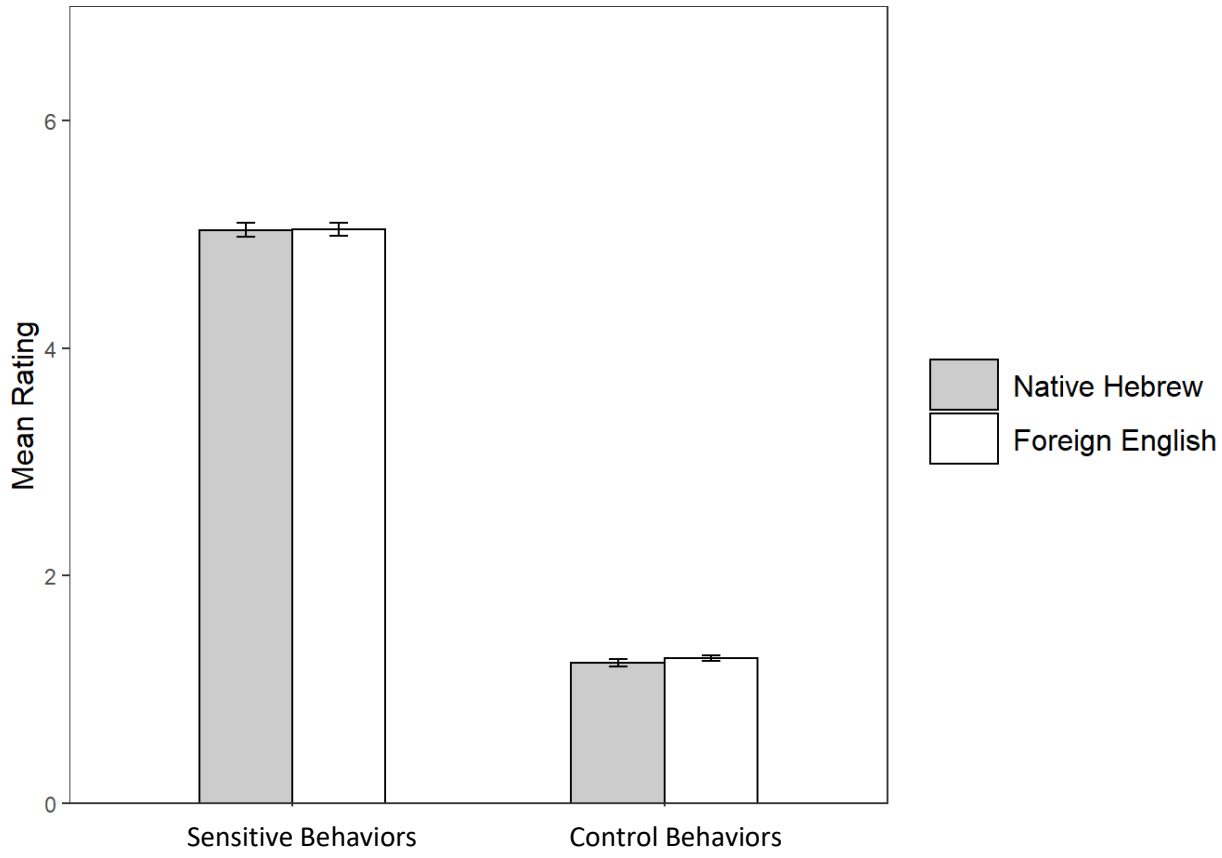

Figure 8. Average ethicality ratings for sensitive and control behaviors in Experiment 7.

Note. Error bars represent standard errors.

Discussion

Taken together, it is unclear whether bilinguals are more likely to divulge sensitive information about norm-violating behaviors when using a nonnative language. Experiment 6 supported the hypothesis with a sample of Mandarin-English bilinguals, while Experiment 7 found no significant effect with a sample of Hebrew-English bilinguals. It is possible that the effect of nativeness of language on divulging sensitive information is culture-specific, although

the slight differences in procedure makes it difficult to identify the reason for the non-replication. I will further discuss these possibilities in the general discussion.

GENERAL DISCUSSION

This dissertation evaluates whether nativeness of language drives social norm adherence. In Experiments 1-5, I examined bilinguals' choice between using a native or nonnative language to talk about embarrassing taboo content. In Experiments 6-7, I examined this research question through a different lens by assessing bilinguals' willingness to divulge sensitive information in response to intrusive questions presented in a native or nonnative language.

Bilinguals' choice of language for speaking about embarrassing content

If the use of a native language motivates adherence to social norms, bilinguals should choose to discuss embarrassing topics in a nonnative language. This account is generally supported by Experiments 1 through 5. In Experiment 1, Cantonese-English bilinguals assigned one topic to speak about in a native language and one topic to speak about in a nonnative language for each pair of embarrassing and neutral items they received. They were more likely than chance to choose a nonnative language for the embarrassing topic and a native language for the neutral topic. Cantonese-English bilinguals in Experiment 2 received a list of embarrassing and neutral items and decided the language they would use for each item. This design closely resembled language choices made in real life as there were no restrictions on the number of items participants must choose for each language. Participants generally did not choose a nonnative language across items, but more importantly for the hypothesis, they chose a nonnative language more frequently for embarrassing topics relative to neutral topics. Experiments 4 and 5 replicated Experiment 1 using the same design with bilinguals who spoke different languages, showing that Mandarin-English bilinguals and English-Spanish bilinguals were more likely than chance to choose a nonnative language for the embarrassing topic and a native language for the neutral topic. Finally, Experiment 3 tested a possible boundary condition of linguistic and cultural

similarity between native and nonnative languages with Cantonese-Mandarin bilinguals. Unlike the other studies, these participants did not choose a nonnative language to speak about embarrassing content. This is likely because Mandarin felt less "foreign" to native Cantonese speakers compared to the other pairs of languages I tested.

Taken together, bilinguals' choice for using a nonnative language (over a native language) was stronger for embarrassing topics relative to neutral topics, except when the native and nonnative languages were highly similar. Furthermore, based on qualitative analyses from Experiments 1 and 5, vocabulary concerns cannot explain the phenomenon. Participants who reported using vocabulary as a criterion for language choice were less likely to select a nonnative language for the embarrassing items compared to those who did not consider vocabulary, whereas those who considered embarrassment showed the opposite pattern of results and were more likely to select a nonnative language for the embarrassing items compared to those who did not consider embarrassment. Additionally, a larger proportion of participants reported using embarrassment or negative emotion as a criterion for language choice, compared to those who mentioned vocabulary.

Language is a rich and multifaceted contextual cue. So far the discussion is focused on the impact of nativeness of language, but languages are also associated with specific cultures and can prime cultural mindsets (Lee et al., 2010). Rather than choosing a nonnative language for embarrassing content, an alternative account is that the cultural associations of the languages motivated the language choices. These accounts are not mutually exclusive, meaning it is possible that both nativeness and culture contributed partly to the observed language choices.

One method of evaluating the relative contributions of culture is to "cross the languages". In other words, I would conduct the same experiment with two complementary populations that

spoke each other's native languages as foreign languages (e.g. English-Spanish bilinguals and Spanish-English bilinguals). If English-Spanish and Spanish-English bilinguals both chose their respective nonnative languages for speaking about embarrassing topics, then it is less likely that language choices are primarily attributable to cultural associations. Unfortunately, the plan was not realized because Spain imposed a lockdown in response to a global pandemic. I decided not to proceed with collecting data while participants were confined to their homes because they might not have access to a private space. Since participants in the experiments believe that they would be reading aloud embarrassing content, it was important they have access to a private space where they could be out of earshot from curious family members or roommates. Otherwise, language choices would be primarily driven by audience considerations and the data would be too noisy. Furthermore, some of stimuli were about disgusting behaviors (e.g. not washing your hands after going to the bathroom). It was difficult to predict how the pandemic would influence participants' reactions to items that relate to personal hygiene.

However, even without crossing the languages, the current set of studies still provides some insight about the relative contributions of cultural associations to language choice. First, it is impossible that cultural rules about specific taboos can account for the language choice observed in all studies, because bilinguals chose a foreign language for a variety of embarrassing content that ranged from sex to excrement to private revelations about sensitive issues. Furthermore, Chinese participants in Experiments 1 and 4 systematically chose English to discuss bathroom activities, even though the taboo of talking about excrement should be less strong in Chinese. Hence, participants did not simply choose the language that is associated with more cultural lenience for the taboos they have to speak about. Second, the phenomenon cannot be accounted for by idiosyncratic characteristics of English as a language or cultural context,

because English was chosen for embarrassing topics among foreign speakers of English (Experiments 1, 2, and 4) but avoided by native speakers of English (Experiment 5). In other words, this is not just an "English" effect.

Third, it is possible that cultural differences in self-disclosure accounted for the phenomenon. When bilinguals discuss embarrassing personal information, they might choose languages that are associated with cultures that encourage more self-disclosure. Cultures differ in how willing people are with sharing private information, and differences in self-disclosure could depend on relational mobility. Relationally mobile societies offer more opportunities to form and terminate relationships and this encourages self-disclosure, because revealing sensitive personal information can signal trust and commitment to a relationship and help maintain tenuous relationships. On the other hand, the risks of disclosure, such as negative reputation and social exclusion, are also lower when relationships come and go easily (Kito et al., 2017; Schug et al., 2010; Thomson et al., 2018). Since Latin America and North America score relatively higher on relational mobility, while East Asia is less mobile (Thomson et al., 2018), it is possible that the languages associated with these cultures serve as cues for whether self-disclosure is appropriate. This would explain why Cantonese-English bilinguals, Mandarin-English bilinguals, and English-Spanish bilinguals chose a nonnative language to discuss embarrassing topics, because their nonnative languages happened to be associated with cultures that encourage self-disclosure. This would also explain why Cantonese-Mandarin bilinguals did not show the same effect, since both languages are associated with a similar culture.

However, cultural differences in self-disclosure cannot fully explain the current phenomenon. Although participants in Experiments 4 and 5 recognized the cultural differences in self-disclosure, these perceptions were uncorrelated with their language choices, with the

exception of a very weak correlation (r = .12) with language choice for moral items in Experiment 4. Furthermore, almost all research on cultural differences in self-disclosure is based on self-report, which may not be an accurate representation of actual self-disclosure behaviors due to memory and cognitive biases.

Cultural differences in self-disclosure is a satisfactory account for the experiments with Chinese-English bilinguals but does not explain the language choices of English-Spanish bilinguals very well. Although the United States score much higher than East Asian countries such as Hong Kong in terms of relational mobility, the difference between Spanish-speaking cultures and English-speaking cultures is much smaller and less clear. It is also possible that American participants are reminded of Spain rather than Latin America when using Spanish, and Spain actually scores slightly lower on relational mobility than the United States (Thomson et al., 2018). Furthermore, while many studies demonstrate that East Asians are more reluctant to self-disclose compared to North Americans (e.g. Asai & Barnlund, 1998; Chen, 1995; Kim et al., 2006, 2008; Kito, 2005; Taylor et al., 2004; Thomson et al., 2012; Thomson & Ito, 2012), the evidence is mixed on whether Latin Americans are more open to revealing personal information than North Americans. Ratings for self-disclosure towards a closest friend were higher in Chile and Mexico than North America, although some other Latin American countries, such as Colombia and Brazil had a similar level of self-disclosure to North America. On the other hand, self-disclosure towards a romantic partner in the United States was higher than most Latin American countries (Thomson et al., 2018). Self-disclosure to strangers might also be less encouraged in Latin America, since Latin Americans were less trusting of strangers than North Americans (Inglehart et al., 2014).[6] Hence, cultural differences in self-disclosure is not a

[6] Based on descriptive data rather than confirmatory data analysis.

particularly strong explanation, especially for English-Spanish bilinguals' language choices in Experiment 5.

Taken together, the current studies suggest that bilinguals' language choices are likely driven by the choice between a native and nonnative language, although it is possible that cultural differences in disclosure may have contributed to the phenomenon as well. My findings are consistent with prior research on how emotional resonance is reduced in a foreign tongue (e.g. Harris et al., 2003; 2006, Puntoni et al., 2009). If emotion is experienced less intensely in a foreign tongue, it makes sense that bilinguals may choose to use a foreign language to distance themselves from aversive emotion. Indeed, I find in Experiments 4 and 5 that participants expected to feel less uncomfortable when reading aloud embarrassing content in a nonnative language compared to a native language. Other than anticipating less discomfort, participants also reported being less fearful of negative judgment from others. This is consistent with the account that social relationships are marked by language (e.g. Kinzler et al., 2007), as people might feel less connected with those around them and care less about social evaluations when using a nonnative language. The phenomenon is also related to the account that nonnative languages reduce the psychological importance of the self (Ivaz et al., 2016; Ivaz et al., 2019), as participants expected that their answers in a nonnative language to be less revealing of the kind of person they are and their personality.

These findings are also consistent with anecdotal reports that a foreign language is preferred for aversive topics. Bilingual authors sometimes choose to write in a foreign language, presumably to distance themselves from emotion (e.g. Kellman, 2000), and therapists report that bilingual clients sometimes switch to a foreign language to talk about trauma (e.g. Altarriba & Santiago-Rivera, 1994; Javier, 1989). Similarly, the native language seems to be chosen when

connecting to emotions is preferred. Multilingual parents report expressing endearment in their native tongue because it feels more authentic (Pavlenko, 2005), and people report swearing and expressing anger in their native tongue, presumably because of its superior emotional force (Dewaele, 2004a, 2006).

Every bilingual can connect to such reports and anecdotes and perhaps provide some more. But these anecdotes are not reliable evidence for the theory of emotion-guided language choice, and this highlights the importance of controlled experiments. The main reason is that such self-reports are inherently biased. Perhaps the best way to appreciate how biased such reports must be is realizing that they are what Gilovich (2008) called "one-sided events." These are events that we notice when they occur, but we do not notice when they do not occur. I might believe that the bus always leaves a few seconds before I arrive at the bus stop, because I see the back of the bus every time it happens. It is an event to be noticed. But when I get to the bus stop and do not see the back of the bus, it is a non-event and therefore I don't notice it. So I base my belief that I always just miss the bus on all those events I code, and have no opportunity to refute my belief because I don't code the counter evidence as it is a "non-event". This is a fundamental problem for any evidence that is based on self-reports or anecdotes. When the client switches into a foreign language to talk about a trauma (e.g. Altarriba & Santiago-Rivera, 1994; Javier, 1989), it is an event and so it is noticed. When the client does not switch languages and talks about the trauma, the therapist does not notice it, as it is a non-event. In this sense such reports are unreliable as evidence.

Hence, we cannot rely solely on anecdotal observations to evaluate bilinguals' language choices because they may be plagued by cognitive biases. Controlled experiments that capture real language choices made in the heat of the moment could address the limitations of prior

work. This set of studies is the first empirical demonstration that bilinguals systematically chose a nonnative language for embarrassing topics compared to neutral topics. Furthermore, it is also the first experimental evidence for the general account that bilinguals' language choices depended on the emotionality of the content.

This research offers an account of the choices that millions of bilinguals encounter every day when communicating. My work also offers a richer understanding of bilinguals' emotional lives more broadly. It has long been assumed that foreign languages are less grounded in emotion, though the evidence is based on anecdotes (e.g. Altarriba & Santiago-Rivera, 1994; Kellman, 2000; Javier, 1989), self-reports (e.g. Dewaele, 2004b, 2006), as well as reactions to isolated words (e.g. Harris et al., 2003; 2006). But anecdotes and self-reports are unreliable, and emotion is rarely experienced without context. Thus, controlled studies that examine bilinguals' reactions to more complex emotions (e.g. embarrassment) in ecologically valid and real interactions enable a more nuanced understanding of bilinguals' emotional experiences. Beyond contributing to our understanding of bilinguals, our research also contributes to theories about the communication of emotional content more generally, revealing the strategies that people adopt and the concerns that they have in anticipation of an embarrassing interaction.

Bilinguals' likelihood to divulge sensitive information in response to intrusive questions presented in a native or nonnative language

If nativeness of language promotes adherence to social norms, then bilinguals should divulge more sensitive information in a nonnative language than in a nonnative language. I sought to investigate this research question in Mandarin-English bilinguals (Experiment 6) and Hebrew-English bilinguals (Experiment 7) and found inconsistent results. In Experiment 6, participants in the nonnative language condition were more likely to divulge sensitive behaviors

related to norm-violations compared to those in the native language condition. Furthermore, nativeness of language did not impact the likelihood of divulging control behaviors. On the contrary, Experiment 7 did not replicate these findings, because the interaction between language and behavior type was not significant.

Without more data, it is difficult to fully understand why this is the case, but it is likely due to either differences in culture or the procedure. If there are cultural differences in the acceptability of the sensitive behaviors in Chinese and Israeli cultures, participants in the two experiments may find the questions to be intrusive to different extents, and this undermines the comparability of the two sets of results. Unfortunately, the moral ratings were collected using drastically different scales in the two experiments and it is not possible to confirm this speculation. Furthermore, languages are not merely native or nonnative and they carry different connotations in different cultures. Whether a language is seen as the language reserved for professional settings, in movies and entertainment, or as a political tool of oppression could impact the way different cultures and individuals react to intrusive questions posed in such languages. Relational mobility and self-disclosure could also be a potential account for the findings in Experiments 6 and 7. Mandarin-English bilinguals divulged more in English than Mandarin, because East Asians are less relationally mobile and encourage less self-disclosure than English-speaking cultures, while Hebrew-English bilinguals did not divulge more in English than in Hebrew, because Israel and the United States are more similar in terms of relational mobility (Thomson et al., 2018).

Cultural reasons aside, Experiment 6 was conducted in-person while Experiment 7 was conducted online. It is possible the effect was eliminated in Experiment 7 because participants were generally more comfortable with disclosing sensitive information in an online setting.

Indeed the results show higher rate of divulging on sensitive items for the native language condition in Experiment 7 (Figure 7) than Experiment 6 (Figure 3), and that may have explained why the interaction between language and behavior type on divulging became non-significant. If participants in Experiment 7 were already comfortable with sharing sensitive information in a native language, presenting the intrusive questions in a nonnative language would not significantly impact divulging rates.

Decisions to withhold sensitive information could have important consequences ranging from legal consequences to missed opportunities for diagnosis, treatment, and patient education in medical settings (e.g. Boekeloo, 2014). Thus, it is important to understand the role of language as a contextual cue that could influence privacy concerns and the willingness to disclose sensitive information. These experiments provide preliminary results that suggest the role of language on divulging could be moderated by culture.

Conclusion

In a globalized world where millions are using more than one language every day, it becomes increasingly important to understand the relationship between language and decision-making. Prior research has focused extensively on how decisions made in a nonnative language are less emotional, for example, by finding that using a foreign language attenuates cognitive biases that are based in emotion (e.g. Keysar et al., 2012). Yet, the effect of language on other aspects of decision-making, such as the consideration of social norm constraints, remain under-researched.

The English actress Kristin Scott Thomas once said, “I really like acting in French. It's actually quite different for me, from acting in English. It's fun acting in a foreign language.

You're liberated or freed from preconceptions." Many of our decisions are bound by social norms, but our reliance on social norms is malleable and depends on the situation. My dissertation demonstrated how the very use of our native tongue enforces the rule of norms. That is why using a nonnative language can liberate bilinguals from the constraints of social norms, enabling them to discuss taboo topics that are otherwise too embarrassing.

REFERENCES

Aggarwal, P., & Zhang, M. (2006). The moderating effect of relationship norm salience on consumers' loss aversion. *Journal of Consumer Research, 33*(3), 413-419. https://doi.org/10.1086/508524

Ajzen I. (2000). Nature and operation of attitudes. *Annual Review of Psychology, 52*, 27–58. https://doi.org/10.1146/annurev.psych.52.1.27

Allison, P. D. (1992). The cultural evolution of beneficent norms. *Social Forces, 71*(2), 279-301. https://doi.org/10.2307/2580012

Altarriba, J. (1992). The representation of translation equivalents in bilingual memory. In *Advances in psychology* (Vol. 83, pp. 157-174). North-Holland. https://doi.org/10.1016/s0166-4115(08)61493-4

Altarriba, J. (2000). Language processing and memory retrieval in Spanish-English bilinguals. *Spanish Applied Linguistics*, *4*(2), 2-245.

Altarriba, J., & Santiago-Rivera, A. L. (1994). Current perspectives on using linguistic and cultural factors in counseling the Hispanic client. *Professional Psychology: Research and Practice*, *25*(4), 388-397. https://doi.org/10.1037/0735-7028.25.4.388

Asai, A., & Barnlund, D.C. (1998). Boundaries of the unconscious, private, and public self in Japanese and Americans: A crosscultural comparison. *International Journal of Intercultural Relations, 22*(4), 431–452. https://doi.org/10.1016/s0147-1767(98)00017-0

Asch, S. E. (1956). Studies of independence and conformity: I. A minority of one against a unanimous majority. *Psychological Monographs: General and applied, 70*(9), 1-70. https://doi.org/10.1037/h0093718

Ayçiçegˇi, A., & Harris, C. (2004). Brief Report: Bilinguals' recall and recognition of emotion words. *Cognition and Emotion, 18*(7), 977-987. https://doi.org/10.1080/02699930341000301

Boekeloo, B. O. (2014). Will you ask? Will they tell you? Are you ready to hear and respond?: barriers to physician-adolescent discussion about sexuality. *JAMA pediatrics*, *168*(2), 111-113. https://doi.org/10.1001/jamapediatrics.2013.4605

Bond, M. H., & Lai, T. M. (1986). Embarrassment and code-switching into a second language. *Journal of Social Psychology, 126*(2), 179-186.

Brislin, R. W. (1980). Translation and content analysis of oral and written materials. *Methodology*, 389-444. https://doi.org/10.1037/10516-122

Chen, G. (1995). Differences in self-disclosure patterns among Americans versus Chinese: A comparative study. *Journal of Cross-Cultural Psychology, 26,* 84–91. https://doi.org/10.1177/0022022195261006

Cialdini, R. B., & Trost, M. R. (1998). Social influence: Social norms, conformity and compliance. In D. T. Gilbert, S. T. Fiske, & G. Lindzey (Eds.), *The handbook of social psychology* (p. 151–192). McGraw-Hill.

Cialdini, R. B., Kallgren, C. A., & Reno, R. R. (1991). A focus theory of normative conduct: A theoretical refinement and reevaluation of the role of norms in human behavior. In *Advances*

in experimental social psychology (Vol. 24, pp. 201-234). Academic Press. https://doi.org/10.1016/s0065-2601(08)60330-5

Cialdini, R. B., Reno, R. R., & Kallgren, C. A. (1990). A focus theory of normative conduct: recycling the concept of norms to reduce littering in public places. *Journal of Personality and Social Psychology*, *58*(6), 1015. https://doi.org/10.1037/0022-3514.58.6.1015

Cipolletti, H., McFarlane, S., & Weissglass, C. (2016). The moral foreign-language effect. *Philosophical Psychology*, *29*(1), 23-40. https://doi.org/10.1080/09515089.2014.993063

Costa, A., Foucart, A., Arnon, I., Aparici, M., & Apesteguia, J. (2014a). "Piensa" twice: on the foreign language effect in decision making. *Cognition, 130*(2), 236-254. https://doi.org/10.1016/j.cognition.2015.05.013

Costa, A., Foucart, A., Hayakawa, S., Aparici, M., Apesteguia, J., Heafner, J., & Keysar, B. (2014b). Your morals depend on language. *PloS one, 9*(4), e94842. https://doi.org/10.1371/journal.pone.0094842

Cranor, L. (2002). *Web privacy with P3P*. O'Reilly Media, Inc.

Dewaele, J. M. (2006). Expressing Anger in Multiple Languages. *Bilingual Minds*, 118–151. doi:10.21832/9781853598746-007

Dewaele, J. M. (2004a). Blistering barnacles! What language do multilinguals swear in?. *Estudios de Sociolingüística, 5*(1), 83-105. https://doi.org/10.1558/sols.v5i1.83

Dewaele, J. M. (2004b). The emotional force of swearwords and taboo words in the speech of multilinguals. *Journal of Multilingual and Multicultural Development, 25*(2-3), 204-222. https://doi.org/10.1080/01434630408666529

Edelmann, R. J. (1981). Embarrassment: The state of research. *Current Psychological Reviews*, *1*(2), 125-137. https://doi.org/10.1007/bf02979260

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior research methods*, *39*(2), 175-191. https://doi.org/10.3758/bf03193146

Fazio, R. H., & Williams, C. J. (1986). Attitude accessibility as a moderator of the attitude–perception and attitude–behavior relations: An investigation of the 1984 presidential election. *Journal of Personality and Social Psychology*, *51*(3), 505-514. https://doi.org/10.1037/0022-3514.51.3.505

Fischhoff, B. (1992). Giving advice: Decision theory perspectives on sexual assault, *American Psychologist*, *47*(4), 577-588. https://doi.org/10.1037/0003-066x.47.4.577

Freedman, J. L., Wallington, S. A., & Bless, E. (1967). Compliance without pressure: The effect of guilt. *Journal of Personality and Social Psychology*, *7*(2), 117-124. https://doi.org/10.1037/h0025009

Gawinkowska, M., Paradowski, M. B., & Bilewicz, M. (2013). Second language as an exemptor from sociocultural norms. Emotion-related language choice revisited. PloS one, *8*(12), e81225. https://doi.org/10.1371/journal.pone.0081225

Geipel J, Hadjichristidis C, & Surian L (2015a). How foreign language shapes moral judgment. *Journal of Experimental Social Psychology*, *59*, 8–17. https://doi.org/10.1016/j.jesp.2015.02.001

Geipel, J., Hadjichristidis, C., & Surian, L. (2015b). The foreign language effect on moral judgment: The role of emotions and norms. *PloS one, 10*(7), e0131529. https://doi.org/10.1371/journal.pone.0131529

Gerber, A. S., & Rogers, T. (2009). Descriptive social norms and motivation to vote: Everybody's voting and so should you. *The Journal of Politics, 71*(1), 178-191. https://doi.org/10.1017/s0022381608090117

Gilovich, T. (2008). *How I know what isn't so*. Simon and Schuster.

Goldstein, N. J., Cialdini, R. B., & Griskevicius, V. (2008). A room with a viewpoint: Using social norms to motivate environmental conservation in hotels. *Journal of Consumer Research, 35*(3), 472-482. https://doi.org/10.1086/586910

Gutierrez, R., & Giner-Sorolla, R. (2007). Anger, disgust, and presumption of harm as reactions to taboo-breaking behaviors. *Emotion, 7*(4), 853-868. https://doi.org/10.1037/1528-3542.7.4.853

Harris, C. L., Ayçíçeğí, A., & Gleason, J. B. (2003). Taboo words and reprimands elicit greater autonomic reactivity in a first language than in a second language. *Applied Psycholinguistics, 24*(4), 561-579. https://doi.org/10.1017/s0142716403000286

Harris, C. L., Gleason, J. B., & Ayçiçeği, A. (2006). When is a First Language More Emotional? Psychophysiological Evidence from Bilingual Speakers. *Bilingual Minds,* 257–283. doi:10.21832/9781853598746-012

Hayakawa, S., Tannenbaum, D., Costa, A., Corey, J. D., & Keysar, B. (2017). Thinking more or feeling less? Explaining the foreign-language effect on moral judgment. *Psychological science*, *28*(10), 1387-1397. https://doi.org/10.1177/0956797617720944

Inglehart, R., C. Haerpfer, A. Moreno, C. Welzel, K. Kizilova, J. Diez-Medrano, M. Lagos, P. Norris, E. Ponarin & B. Puranen et al. (eds.). 2014. *World Values Survey: Round Five - Country-Pooled Datafile 2005-2008*. Madrid: JD Systems Institute. Version:http://www.worldvaluessurvey.org/WVSDocumentationWV5.jsp.

Ivaz, L., Costa, A., & Duñabeitia, J. A. (2016). The emotional impact of being myself: Emotions and foreign language processing. *Journal of Experimental Psychology: Learning, Memory and Cognition*, *42*(3), 489–496. https://doi.org/10.1037/xlm0000179

Ivaz, L., Griffin, K. L., & Duñabeitia, J. A. (2019). Self-bias and the emotionality of foreign languages. *Quarterly Journal of Experimental Psychology*, 72(1), 76-89. https://doi.org/10.1177/1747021818781017

Javier, R. A. (1989). Linguistic considerations in the treatment of bilinguals. *Psychoanalytic Psychology*, 6(1), 87-96. https://doi.org/10.1037/0736-9735.6.1.87

Kellman, S. (2000). The translingual imagination. Lincoln, NE: University of Nebraska Press

Keysar, B., Hayakawa, S. L., & An, S. G. (2012). The foreign-language effect: Thinking in a foreign tongue reduces decision biases. *Psychological Science*, *23*(6), 661-668. https://doi.org/10.1177/0956797611432178

Kim, H. S., Sherman, D. K., & Taylor, S. E. (2008). Culture and social support. *American psychologist*, 63(6), 518-526. https://doi.org/10.1037/0003-066X

Kim, H.S., Sherman, D.K., Ko, D., & Taylor, S.E. (2006). Pursuit of comfort and pursuit of harmony: Culture, relationships, and social support seeking. *Personality and Social Psychology Bulletin*, 32, 1595–1607. https://doi.org/10.1177%2F0146167206291991

Kinzler, K.D., Dupoux, E., & Spelke, E.S. (2007). The native language of social cognition. *Proceedings of the National Academy of Sciences of the United States of America, 104*(30), 12577–12580. https://doi.org/10.1073/pnas.0705345104

Kinzler, K.D., Shutts, K., DeJesus, J., & Spelke, E.S. (2009). Accent trumps race in guiding children's social preferences. *Social Cognition, 27*(4), 623–634. https://doi.org/10.1521/soco.2009.27.4.623

Kito, M. (2005). Self-disclosure in romantic relationships and friendships among American and Japanese college students. *The Journal of Social Psychology, 145*(2), 127–140. https://doi.org/10.3200/SOCP.145.2.127-140

Kito, M., Yuki, M., & Thomson, R. (2017). Relational mobility and close relationships: A socioecological approach to explain cross-cultural differences. *Personal Relationships*, *24*(1), 114–130. https://doi.org/10.1111/pere.12174

Kray, L., & Gonzalez, R. (1999). Differential weighting in choice versus advice: I'll do this, you do that. *Journal of Behavioral Decision Making*, *12*(3), 207-218. https://doi.org/10.1002/(SICI)1099-0771(199909)12:3<207::AID-BDM322>3.0.CO;2-P

Landis, J. R., & Koch, G. G. (1977). An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics*, 33(2), 363-374. http://doi.org/10.2307/2529786

Leary, M. R., & Schreindorfer, L. S. (1998). The stigmatization of HIV and AIDS: Rubbing salt in the wound. In V. J. Derlega & A. P. Barbee (Eds.), *HIV and social interaction* (pp. 12–29). Sage Publications, Inc.

Lee, S. W., Oyserman, D., & Bond, M. H. (2010). Am I doing better than you? That depends on whether you ask me in English or Chinese: Self-enhancement effects of language as a cultural mindset prime. *Journal of Experimental Social Psychology*, *46*(5), 785-791. https://doi.org/10.1016/j.jesp.2010.04.005

Leippe, M. R., & Elkin, R. A. (1987). When motives clash: Issue involvement and response involvement as determinants of persuasion. *Journal of Personality and Social Psychology, 52*(2), 269-278. https://doi.org/10.1037/0022-3514.52.2.269

Lumsden C.J. (1988) Psychological Development: Epigenetic Rules and Gene-Culture Coevolution. In: MacDonald K.B. (Eds). *Sociobiological Perspectives on Human Development* I (pp. 234-267). Springer, New York, NY. https://doi.org/10.1007/978-1-4612-3760-0_8

Marian, V., & Neisser, U. (2000). Language-dependent recall of autobiographical memories. *Journal of Experimental Psychology: General*, *129*(3), 361-368. https://doi.org/10.1037/0096-3445.129.3.361

Nichols, S., Kumar, S., Lopez, T. (2013, July). *Rational learners and non–utilitarian rules*. Paper presented at the annual meeting of the International Association for Computing and Philosophy, College Park, Maryland, US.

Opp, K. D. (1982). The evolutionary emergence of norms. *British Journal of Social Psychology, 21*(2), 139-149. https://doi.org/10.1111/j.2044-8309.1982.tb00522.x

Pavlenko, A. (2005). *Emotions and multilingualism*. New York, NY: Cambridge University Press.

Perkins, H. W. (2002). Social norms and the prevention of alcohol misuse in collegiate contexts. *Journal of Studies on Alcohol, supplement*, (14), 164-172. https://doi.org/10.15288/jsas.2002.s14.164

Pew Research Center. (2015, June 01). *Global Views on Morality*. Retrieved from http://www.pewglobal.org/2014/04/15/global-morality/table/premarital-sex/

Prentice, D. A. (1990). Familiarity and differences in self- and other-representations. *Journal of Personality and Social Psychology, 59*(3), 369-383. https://doi.org/10.1037/0022-3514.59.3.369

Prentice, D. A., & Miller, D. T. (1993). Pluralistic ignorance and alcohol use on campus: some consequences of misperceiving the social norm. *Journal of Personality and Social Psychology, 64*(2), 243-256. https://doi.org/10.1037/0022-3514.64.2.243

Prewitt-Freilino, J.L., Bosson, J.K., Burnaford, R.M., Weaver, J.R. (2012). Crossing party lines: political identity and partisans' reactions to violating party norms. *Group Processes & Intergroup Relations, 15,* 317-332. https://doi.org/10.1177/1368430211428162

Puntoni, S., De Langhe, B., & Van Osselaer, S. M. (2009). Bilingualism and the emotional intensity of advertising language. Journal of consumer research, 35(6), 1012-1025. https://doi.org/10.1086/595022

Rottman, J., & Young, L. (2015). Mechanisms of moral development. In Decety J. & Wheatley T. (Eds.), *The moral brain: A multidisciplinary perspective*. Cambridge, MA: MIT Press.

Schug, J., Yuki, M., & Maddux, W. (2010). Relational mobility explains between- and within-culture differences in self-disclosure to close friends. *Psychological Science, 21*(10), 1471–1478. https://doi.org/10.1177/0956797610382786

Schultz, P. W., Nolan, J. M., Cialdini, R. B., Goldstein, N. J., & Griskevicius, V. (2007). The constructive, destructive, and reconstructive power of social norms. *Psychological science, 18*(5), 429-434. https://doi.org/10.1111/j.1467-9280.2007.01917.x

Steinel, W., Van Kleef, G. A., Van Knippenberg, D., Hogg, M. A., Homan, A. C., & Moffitt, G. (2010). How intragroup dynamics affect behavior in intergroup conflict: The role of group norms, prototypicality, and need to belong. *Group Processes & Intergroup Relations, 13*(6), 779-794. https://doi.org/10.1177/1368430210375702

Szczygiel, M. E. (2017). Sociology of Waste in Christian Europe and Japan. *Journal of International and Advanced Japanese Studies*, *9*, 237-250. http://doi.org/10.15068/00146789

Szczygiel, M. E. (2019). Understanding Relatively High Social Visibility of Excrement in Japan. *Silva Iaponicarum*, *60/61*, 94-138. http://doi.org/10.14746/sijp.2019.60/61.5

Tang, C., & van Heuven, V. J. (2009). Mutual intelligibility of Chinese dialects experimentally tested. *Lingua*, *119*, 709–732. https://doi.org/10.1016/j.lingua.2008.10.001

Taylor, S. E., Sherman, D. K., Kim, H. S., Jarcho, J., Takagi, K., & Dunagan, M. S. (2004). Culture and social support: Who seeks it and why? *Journal of Personality and Social Psychology*, *87*(3), 354–362. https://doi.org/10.1037/0022-3514.87.3.354

Thomson, R., & Ito, N. (2012). The effect of relational mobility on SNS user behavior: A study of Japanese dual-users of Mixi and Facebook. *国際広報メディア・観光学ジャーナル*, *14*, 3-22. http://hdl.handle.net/2115/48860

Thomson, R., Ito, N., Suda, H., Lin, F., Liu, Y., Hayasaka, R., ... & Wang, Z. (2012, April). Trusting tweets: The Fukushima disaster and information source credibility on Twitter. In *ISCRAM*.

Thomson, R., Yuki, M., Talhelm, T., Schug, J., Kito, M., Ayanian, A. H., Becker, J. C., Becker, M., Chiu, C., Choi, H.-S., Ferreira, C. M., Fülöp, M., Gul, P., Houghton-Illera, A. M., Joasoo, M., Jong, J., Kavanagh, C. M., Khutkyy, D., Manzi, C., … Visserman, M. L. (2018). Relational mobility predicts social behaviors in 39 countries and is tied to historical farming and threat. *Proceedings of the National Academy of Sciences*, *115*(29), 7521–7526. https://doi.org/10.1073/pnas.1713191115

Wheeless, L. R. (1978). A follow-up study of the relationships among trust, disclosure, and interpersonal solidarity. *Human Communication Research*, *4*, 143–157. https://doi.org/10.1111/j.1468-2958.1978.tb00604.x

Xing, F. (1991). *Xiandai Hanyu [Modern Chinese]*. Beijing: Chinese Higher Education Press.

Zahn-Waxler, C., Radke-Yarrow, M., & King, R. A. (1979). Child rearing and children's prosocial initiations toward victims of distress. *Child Development*, *50*(2), 319-330. http://doi.org/10.2307/1129406

Zikmund-Fisher, B. J., Sarr, B., Fagerlin, A., & Ubel, P. A. (2006). A matter of perspective: choosing for others differs from choosing for yourself in making treatment decisions.

Journal of General Internal Medicine, 21(6), 618-622. https://doi.org/10.1111/j.1525-1497.2006.00410.x

APPENDIX A

Items Used in Each Study

Table A1

Items Used in Experiment 1

	Topic 1 in Cantonese (Native)	Topic 1 in English (Nonnative)	Topic 2 in Cantonese (Native)	Topic 2 in English (Nonnative)
Experimental pairs	自慰	Masturbation	刷牙	Brushing teeth
	洗澡時清洗私處	Washing your private areas when taking a shower	爬樓梯	Climbing up the stairs
	腹瀉時大便	Pooping when you have diarrhea	喝水	Drinking water
	便秘時大便	Pooping when you have constipation	走路	Walking
	法式接吻	French-kissing	洗手	Washing hands
	挖鼻屎	Nose-picking	吃蘋果	Eating an apple
Filler pair	拍手	Clapping hands	穿鞋	Putting on shoes

Table A2

Items Used in Experiment 2

Topic Type	Cantonese (Native)	English (Nonnative)
Embarrassing	描述你認為口交是如何進行的。	Describe how you think oral sex works.
Embarrassing	描述你認識或嘗試過的所有性愛體位。	Describe all the sexual positions that you know of or have tried.
Embarrassing	描述你通常是如何自慰的。	Describe how you usually masturbate.
Embarrassing	有什麼會令你性喚起？	What makes you sexually aroused?
Embarrassing	當你清潔私處的時候，下體感覺如何？	When you clean your private parts, how does it feel down there?
Neutral	你生病的時候會避免吃哪些食物？為什麼？	What foods do you avoid eating when you are sick? Why?
Neutral	描述傷口癒合的過程。	Describe the process of wound healing.
Neutral	解釋正確的洗手方式，以及洗手如何能夠防止疾病傳播。	Explain the correct way of handwashing, and how handwashing can prevent the spread of diseases.
Neutral	請描述所有預防心臟病的方法。	Please describe all the ways heart disease could be prevented.
Neutral	除了飯前洗手以外，還有什麼能預防肚瀉的方法？	Aside from washing your hands before meals, what are other ways of preventing diarrhea?

Table A3

Items Used in Experiment 3

Topic Type	Cantonese (Native)	Mandarin (Nonnative)
Embarrassing	描述你認為口交係點樣進行嘅。	描述你认为口交是如何进行的。
Embarrassing	描述你所有認識或者嘗試過嘅性愛體位。	描述你所有认识或者尝试过的性爱体位。
Embarrassing	描述你平時係點樣自慰嘅。	描述你平时是怎样自慰的。
Embarrassing	有乜嘢會令你性喚起?	有什么会令你性唤起?
Embarrassing	當你清潔緊私人部位嘅時候，你下體有咩感覺?	当你清洁私人部位的时候，你下体有什么感觉?
Neutral	你病嘅時候會避免食邊啲食物? 點解?	你生病的时候会避免吃哪些食物？为什么?
Neutral	描述傷口癒合嘅過程。	描述伤口愈合的过程。
Neutral	解釋正確嘅洗手方法，同埋洗手點樣能夠防止疾病傳播。	解释正确的洗手方法，以及洗手如何能够防止疾病传播。
Neutral	請描述所有預防心臟病嘅方法。	请描述所有预防心臟病的方法。
Neutral	除咗飯前洗手之外，仲有乜嘢方法可以預防肚瀉?	除了饭前洗手之外，还有什么方法可以预防肚泻?

Table A4

Disgust Items Used in Experiment 4

Embarrassing Topic in Mandarin (Native)	Embarrassing Topic in English (Nonnative)	Neutral Topic in Mandarin (Native)	Neutral Topic in English (Nonnative)
我经常用___挖鼻屎。【多于一个手指，同一个手指，我的右/左手】	I often pick my nose using ____. [more than one finger, the same finger, my right/left hand]	我通常用___来吃饭。【筷子，勺子和筷子，刀叉】	I usually eat meals using ____. [chopsticks, a spoon and chopsticks, a fork and a knife]
有时候，我喜欢___睡觉。【不穿任何衣服，只穿内裤，不穿裤子】	Sometimes, I like to sleep ____. [without any clothes, with only my underpants, without pants]	有时，我喜欢在___起床。【下午，早上十点前，太阳升起前】	Sometimes, I like to wake up ____. [in the afternoon, before 10 in the morning, before the sun rises]
我不总是小便完后___。【洗手，擦我的私处，冲厕所】	I don't always ____ after I pee. [wash my hands, wipe my privates, flush the toilet]	我不会总是享受吃___。【很多肉，蔬菜，面条】	I don't always enjoy eating ____. [a lot of meat, vegetables, noodles]
有时，我喜欢我的___的味道。【嗝，汗，屁】	Sometimes, I like the smell of my ____. [burps, sweat, farts]	有时候，我喜欢___的声音。【鸟鸣，雨，浪花】	Sometimes, I like the sound of ____. [bird chirps, rain, waves]
在没有人时，我有时会抓___。【我的脚趾，我的暗疮，我的腿内侧】	When no one is around, I sometimes scratch ____. [my toes, my pimples, the inside of my legs]	当我无聊时，我有时喜欢___。【给朋友发消息，听音乐，看新闻】	When I am bored, I sometimes like to____. [message my friends, listen to music, read the news]
我的大便通常看起来是___。【长的，圆的，水状的】	My poop usually looks ____. [long, round, watery]	我的头发通常看起来是___。【直的，卷的，黑色的】	My hair usually looks ____. [straight, curly, black]
有时，我看见___在我大便里。【辣椒，玉米，菇】	Sometimes, I see ____ in my poop. [chili peppers, corn, mushrooms]	有时候，我会___听音乐。【用手机，用耳机，用我的电脑】	Sometimes, I listen to music ____. [on the phone, using headphones, on my computer]

Table A4 (Continued)

Disgust Items Used in Experiment 4

Embarrassing Topic in Mandarin (Native)	Embarrassing Topic in English (Nonnative)	Neutral Topic in Mandarin (Native)	Neutral Topic in English (Nonnative)
每天，我会用___清洁我的私处。【几秒钟，半分钟，多于一分钟】	Every day, I use ____ to clean my privates. [a few seconds, half a minute, more than a minute]	每天，我吃___来保持健康。【生的或熟的蔬菜，水果或果汁，坚果】	Every day, I eat ____ to keep myself healthy. [raw or cooked vegetables, fruits or fruit juice, nuts]
当我清洁我的屁股时，我会用___。【纸巾，水，肥皂和水】	When I clean my butt, I use ____. [tissues, water, both soap and water]	当我清洁我的厨房时，我会用___。【毛巾，刷子，毛巾和刷子】	When I clean my kitchen, I use ____. [towels, brushes, towels and brushes]
当我清洁我的私处时，我喜欢___。【用我的手指，用海绵，用肥皂】	When I clean my privates, I like to ____. [use my fingers, use a sponge, use soap]	当我清洁我的洗手池时，我喜欢___。【用香皂，只用水，用刷子】	When I clean my sink, I like to ____. [use soap, use only water, use a brush]
当我在家里时，我不总是___。【穿裤子，穿衣服，穿内裤】	I don't always ____ when I am at home. [wear pants, wear clothes, wear underpants]	工作或学习时，我不总是___。【用我的手机，接电话，带我的电脑】	I don't always ____ when I am at work or school. [use my phone, answer calls, bring my computer]
如果我吃太多___，我的屁会更臭。【豆子，蒜，辣的食物】	My farts are smellier if I eat too much ____. [beans, garlic, spicy food]	如果我吃太多___，我会感到更加口渴。【咸的食物，辣的食物，油炸食物】	I am thirstier if I eat too much ____. [salty food, spicy food, fried food]
___总是感觉很好。【挖鼻屎，抓挠我的私处，放屁】	____ always feels very nice. [Picking my nose, Scratching my privates, Farting]	___常常使我开心。【和父母谈话，和朋友见面，运动】	____ often makes me happy. [Talking to my parents, Meeting my friends, Playing sports]
___，我觉得很难拉大便。【在过去几天中，上周某时候，上个月某时候】	____, I felt it was very hard to poop. [In the past few days, Some time last week, Some time last month]	____, 我和朋友们度过了一段美好的时光。【上个暑假，大概上个月，大概上周】	____, I had a great time with my friends. [Last summer, Last month or so, Last week or so]

Table A4 (Continued)

Disgust Items Used in Experiment 4

Embarrassing Topic in Mandarin (Native)	Embarrassing Topic in English (Nonnative)	Neutral Topic in Mandarin (Native)	Neutral Topic in English (Nonnative)
曾经，我连续___没有洗澡。【一到两天，三天及以上，将近一周】	Once, I did not shower for ____. [one or two days, three or more days, almost a week]	曾经，我___没有睡好觉。【几天，一周或更久，将近一个月】	Once, I did not sleep well for ____. [a few days, a week or more, almost a month]

Table A5

Intrusive Items Used in Experiment 4

Embarrassing Topic in Mandarin (Native)	Embarrassing Topic in English (Nonnative)	Neutral Topic in Mandarin (Native)	Neutral Topic in English (Nonnative)
我曾经偷过___误给我的钱。【一个朋友，一个餐厅，一个商店】	I have stolen money that ___ gave to me by mistake. [a friend, a restaurant, a store]	我有时给我朋友买___做礼物。【一些鲜花，书本，一些食物】	I sometimes buy ___ as gifts for my friends. [some flowers, books, some food]
我曾经非法下载过___。【音乐，视频，电脑程序】	I have illegally downloaded ___ before. [music, videos, computer programs]	我喜欢在网上买___。【衣服和鞋，电子产品，书】	I like to shop for ___ on the internet. [clothes and shoes, electronics, books]
我曾经把我___秘密告诉过别人。【朋友的，家人的，男友/女友的】	I once told my ___ secret to another person. [friend's, family's, boyfriend/girlfriend's]	我经常和我的朋友或家人谈论___。【食物，学业，工作】	I often talk to my friends or family about ___. [food, school, work]
我曾经把我的过失怪罪到___头上。【同学，同事，队友】	I once blamed ___ for my mistake. [a classmate, a coworker, a teammate]	我曾经和我的家庭成员去___旅行。【日本，韩国，欧洲】	I have travelled to ___ with family members. [Japan, Korea, Europe]
我曾经___对于我的资质撒谎。【在一个工作申请上，在简历上，向我的老板】	I have lied about my qualifications ___. [on a job application, on my CV, to my boss]	最近，我的___ 技术提高了。【武术，钢琴，游泳】	I have improved my skills in ___ recently. [martial arts, the piano, swimming]
我曾经在他人非常不情愿时拍下___的照片。【小孩，朋友，陌生人】	I have taken photos of ___ when they really didn't want to. [children, friends, strangers]	大学或中学时，我曾经上过很多___课。【数学和科学，历史和文学，语言】	In university or secondary school, I have taken many classes in ___. [math and science, history and literature, languages]
我曾经冒充___签名。【一个家人的，我的老板的，我的同事的】	I have faked ___ signature. [a family member's, my boss', my coworker's]	我最近去过___家。【一个朋友的，一个同事的，一个同学的】	I have visited ___ home recently. [a friend's, a coworker's, a classmate's]

Table A5 (Continued)

Intrusive Items Used in Experiment 4

Embarrassing Topic in Mandarin (Native)	Embarrassing Topic in English (Nonnative)	Neutral Topic in Mandarin (Native)	Neutral Topic in English (Nonnative)
我曾经偷走了我在地上捡到的___。【现金，钱包，贵重物品】	I have stolen ___ that I found on the street. [cash, a wallet, expensive items]	我在街上或公共交通工具上丢过___。【我的钱包，钱，一个包】	I have lost ___ on the street or public transport. [my wallet, money, a bag]
我曾经编造过关于___的借口。【一个严重疾病，家庭成员的死亡，一种残疾】	Once, I made up an excuse about ___. [a serious illness, the death of a family member, a disability]	有一次，我在家做___当晚饭。【汤面，意大利面，炒饭】	Once, I made ___ for dinner at home. [noodles in soup, spaghetti, fried rice]
我曾经未经允许看过某人的___。【手机，邮箱，社交媒体账号】	I have looked at someone's ___ without permission. [phone, email, social media account]	我喜欢看关于___的电影或电视节目。【爱情，饮食，动物】	I like to watch movies or TV shows about ___. [romance, food and drink, animals]
我因为我朋友们的___而嫉妒他们。【成就，薪水，感情生活】	I am jealous of my friends because of their ___. [achievements, salaries, love life]	我喜欢我的朋友因为我们有共同___。【爱好，背景，社交圈】	I like my friends because I have the same ___. [interests, background, social circle]
我曾经非常被___所吸引。【某个同性别的人，一个老师或老板，某个比我大很多的人】	Once, I felt very attracted to ___. [someone of the same gender, a teacher or boss, someone much older than myself]	有一次，我为___而非常开心。【一个在学校的成就，某个人的表扬，一个来自朋友的礼物】	Once, I felt very happy about ___. [an achievement in school, a compliment from someone, a gift from a friend]
我曾经因为说很刻薄的话伤害过___。【一个家庭成员，一个同事，一个朋友】	I have hurt ___ by saying something very mean. [a family member, a coworker, a friend]	我有过通过社交媒体和___保持联系。【一个住在远方的家人，一个老同学，一个儿时朋友】	I have stayed in contact with ___ through social media. [a family member living faraway, an old classmate, a friend from childhood]
我为我的家人___感到尴尬。【的教育水平，的想法和性格，说的话】	I feel embarrassed by my family because of ___. [their education level, their opinions and personality, the things they say]	我喜欢我家人因为他们___。【有趣，非常支持我的梦想，关心我】	I like my family because they ___. [are fun, are very supportive of my dreams, care about me]

Table A5 (Continued)

Intrusive Items Used in Experiment 4

Embarrassing Topic in Mandarin (Native)	Embarrassing Topic in English (Nonnative)	Neutral Topic in Mandarin (Native)	Neutral Topic in English (Nonnative)
在我的睡眠中，我梦到过___。【伤害他人，做爱，裸体】	In my sleep, I have dreamed of ___. [hurting people, having sex, being naked]	在我的睡眠中，我梦到过___。【吃东西，飞翔，游泳】	In my sleep, I have dreamed of ___. [eating food, flying, swimming]

Table A6

Disgust Items Used in Experiment 5

Embarrassing Topic in English (Native)	Embarrassing Topic in Spanish (Nonnative)	Neutral Topic in English (Native)	Neutral Topic in Spanish (Nonnative)
I often pick my nose with ____. [more than one finger, the same finger, my right/left hand]	A menudo me hurgo la nariz con ____. [más de un dedo, el mismo dedo, mi mano derecha/mano izquierda]	I usually eat meals using ____. [a fork, a fork and a spoon, a fork and a knife]	Yo generalmente como usando ____. [un tenedor, un tenedor y una cuchara, un tenedor y un cuchillo]
Sometimes, I like to sleep ____. [without clothing, only with my underpants, without pants]	A veces me gusta dormir ____. [sin ropa, solo con mis calzoncillos, sin pantalones]	Sometimes, I like to wake up ____. [in the afternoon, before 10 in the morning, before the sun rises]	A veces me gusta despertarme ____. [en la tarde, antes de las 10 de la mañana, antes de que salga el sol]
I don't always ____ after I pee. [wash my hands, wipe my privates, flush the toilet]	No siempre ____ después de orinar. [me lavo las manos, me limpio mis partes privadas, tiro la cadena]	I don't always enjoy eating ____. [a lot of meat, vegetables, noodles]	No siempre disfruto comer ____. [mucha carne, verduras, fideos]
Sometimes, I like the smell of my ____. [burps, sweat, farts]	A veces, me gusta el olor de mis/mi ____. [eructos, sudor, pedos]	Sometimes, I like the sound of ____. [birds chirping, the rain, the waves]	A veces me gusta el sonido de ____. [el gorjeo de los pájaros, la lluvia, las olas]
When no one is around, I sometimes scratch ____. [my toes, my pimples, the inside of my legs]	Cuando no hay nadie cerca, a veces me rasco ____. [mis dedos de los pies, mis granos, el interior de mis piernas]	When I am bored, I sometimes like to____. [send messages to my friends, listen to music, read the news]	Cuando estoy aburrido/a, a veces me gusta____. [enviarle mensajes a mis amigos/as, escuchar música, leer las noticias]
My poop usually is ____. [long, round, watery]	Mi caca generalmente es ____. [larga, redonda, líquida]	My hair usually is ____. [straight, curly, black]	Mi pelo generalmente es ____. [liso, rizado, negro]

Table A6 (Continued)

Disgust Items Used in Experiment 5

Embarrassing Topic in English (Native)	Embarrassing Topic in Spanish (Nonnative)	Neutral Topic in English (Native)	Neutral Topic in Spanish (Nonnative)
Sometimes, I see ____ in my poop. [vegetables, corn, mushrooms]	A veces veo ____ en mi caca. [vegetales, maíz, champiñones]	Sometimes, I listen to music ____. [on the phone, using headphones, on my computer]	A veces escucho música ____. [en el teléfono, usando auriculares, en mi computadora]
Every day, I clean my privates for ___. [a few seconds, half a minute, more than a minute]	Todos los días me lavo mis partes íntimas por ____. [unos segundos, medio minuto, más de un minuto]	Every day, I eat ____ to keep myself healthy. [raw or cooked vegetables, fruits or dried fruit, nuts]	Todos los días como ____ para mantenerme saludable. [vegetales crudos o cocidos, frutas o frutas secas, nueces]
When I clean my butt, I use ____. [tissues, water, soap and water]	Cuando limpio mi trasero, uso ____. [pañuelos, agua, jabón y agua]	When I clean my kitchen, I use ____. [towels, brushes, towels and brushes]	Cuando limpio mi cocina, uso ____. [toallas, cepillos, toallas y cepillos]
When I clean my privates, I like to ____. [use my fingers, use a sponge, use soap]	Cuando limpio mis partes íntimas, me gusta ____. [usar mis dedos, usar una esponja, usar jabón]	When I clean my sink, I like to ____. [use soap, only use water, use a brush]	Cuando limpio mi fregadero, me gusta ____. [usar jabón, solo usar agua, usar un cepillo]
I don't always ____ when I am at home. [use pants, use clothes, use underpants]	No siempre ____ cuando estoy en casa. [uso pantalones, uso ropa, uso ropa interior]	I don't always ____ when I am at work or school. [use my phone, answer calls, bring my computer]	No siempre ____ cuando estoy en el trabajo o en la escuela. [uso mi teléfono, contesto llamadas, traigo mi computadora]
My farts are smellier if I eat too much ____. [beans, garlic, spicy food]	Mis pedos son más olorosos si como demasiado ____. [frijoles, ajo, comida picante]	I am thirstier if I eat too much ____. [salty food, spicy food, fried food]	Tengo más sed si como demasiada ____. [comida salada, comida picante, comida frita]

Table A6 (Continued)

Disgust Items Used in Experiment 5

Embarrassing Topic in English (Native)	Embarrassing Topic in Spanish (Nonnative)	Neutral Topic in English (Native)	Neutral Topic in Spanish (Nonnative)
____ always feels very nice. [Picking my nose, Scratching my privates, Farting]	____ siempre me hace sentir bien. [Hurgarme la nariz, rascar mis partes privadas, tirarme pedos]	____ often makes me happy. [Talking to my parents, Meeting up with my friends, Playing sports]	____ a menudo me hace feliz. [Hablar con mis padres, encontrarme con mis amigos/as, jugar deportes]
____, I felt it was very hard to poop. [In the past few days, Sometime last week, Sometime last month]	____, he sentido que era muy difícil hacer caca. [En los últimos días, En algún momento de la semana pasada, En algún momento del mes pasado]	____, I had a great time with my friends. [Last summer, Last month, in the past few days]	____, la pasé muy bien con mis amigos/as. [El verano pasado, El mes pasado, En los últimos días]
Once, I did not shower for ____. [one or two days, three days or more, almost a week]	Una vez no me duché por ____. [uno o dos días, tres días o más, casi una semana]	Once, I did not sleep well for ____. [a few days, a week or more, almost a month]	Una vez no dormí bien durante ____. [unos días, una semana o más, casi un mes]

Table A7

Intrusive Items Used in Experiment 5

Embarrassing Topic in English (Native)	Embarrassing Topic in Spanish (Nonnative)	Neutral Topic in English (Native)	Neutral Topic in Spanish (Nonnative)
I have stolen money that ___ gave to me by mistake. [a friend, a restaurant, a store]	He robado dinero que ___ me dio por error. [un/a amigo/a, un restaurante, una tienda]	I sometimes buy ___ as gifts for my friends. [flowers, books, food]	A veces compro ___ como regalos para mis amigos/as. [flores, libros, comida]
I have illegally downloaded ___ before. [music, videos, computer programs]	He descargado ilegalmente ___. [música, videos, programas de computadora]	I like to buy ___ on the internet. [clothes and shoes, technology, books]	Me gusta comprar ___ en el Internet. [ropa y zapatos, tecnología, libros]
I once told my ___ secret to another person. [friend's, family's, boyfriend/girlfriend's]	Una vez le conté un secreto de mi ___ a otra persona. [amigo/a, familia, novio/a]	I often talk to my friends or family about ___. [food, school, work]	A menudo hablo con mis amigos o familiares sobre ___. [comida, la escuela, el trabajo]
I once blamed ___ for my mistake. [a classmate, a coworker, a teammate]	Una vez culpé a ___ por mi error. [un/a compañero/a de clase, un/a compañero/a de trabajo, un/a compañero/a de equipo]	I have travelled to ___ with family members. [Japan, Korea, Europe]	He viajado a ___ con familiares. [Japón, Corea, Europa]
I have lied about my qualifications ___. [on a job application, on my CV, to my boss]	He mentido sobre mis calificaciones ___. [en una solicitud de empleo, en mi CV, a mi jefe]	I have improved my skills in ___ recently. [basketball, drawing, swimming]	He mejorado mis habilidades en ___ recientemente. [baloncesto, dibujar, natación]
I have taken photos of ___ when they really didn't want to. [children, friends, strangers]	He tomado fotos de ___ cuando realmente no querían. [niños/as, amigos/as, extraños/as]	In university or high school, I have taken many classes in ___. [math and science, history and literature, languages]	En la universidad o escuela superior, he tomado muchas clases de ___. [matemáticas y ciencias, historia y literatura, idiomas]
I have faked ___ signature. [a family member's, my boss', my coworker's]	He falsificado la firma de ___. [un miembro de la familia, mi jefe, mi compañero/a de trabajo]	I have visited ___ home recently. [a friend's, a coworker's, a classmate's]	He visitado la casa de ___ recientemente. [un/a amigo/a, un/a compañero/a de trabajo, un/a compañero/a de clase]

Table A7 (Continued)

Intrusive Items Used in Experiment 5

Embarrassing Topic in English (Native)	Embarrassing Topic in Spanish (Nonnative)	Neutral Topic in English (Native)	Neutral Topic in Spanish (Nonnative)
I have stolen ___ that I found on the street. [cash, a wallet, expensive items]	He robado ___ que encontré en la calle. [dinero en efectivo, una billetera, artículos caros]	I have lost ___ on the street or public transport. [my wallet, money, a bag]	He perdido ___ en la calle o en el transporte público. [mi billetera, dinero, una bolsa]
Once, I made up an excuse about ___. [a serious illness, the death of a family member, a disability]	Una vez me inventé una excusa sobre ___. [una enfermedad grave, la muerte de un miembro de la familia, una discapacidad]	Once, I made ___ for dinner at home. [grilled chicken, pasta, roasted potatoes]	Una vez, hice ___ para cenar en casa. [pollo a la parilla, fideos, papas al horno]
I have looked at someone's ___ without permission. [phone, email, social media account]	He mirado ___ de alguien sin permiso. [el teléfono, el correo electrónico, la cuenta de redes sociales]	I like to watch movies or TV shows about ___. [romance, food and drink, animals]	Me gusta ver películas o programas de televisión sobre ___. [romances, comida y bebida, animales]
I am jealous of my friends for their ___. [achievements, salaries, love life]	Estoy celoso de mis amigos/as por sus ___. [logros, salarios, vidas amorosas]	I like my friends because we have the same ___. [interests, background, social circle]	Me gustan mis amigos/as porque tenemos los mismos ___. [intereses, antecedentes, círculos sociales]
Once, I felt very attracted to ___. [someone of the same gender, a teacher or boss, someone much older than myself]	Una vez me sentí muy atraído por ___. [alguien del mismo género, un/a profesor/a o jefe/a, alguien mucho mayor que yo]	Once, I felt very happy about ___. [an achievement in school, a compliment from someone, a gift a friend gave me]	Una vez me sentí muy feliz por ___. [un logro en la escuela, un cumplido de alguien, un regalo que me dio un/a amigo/a]
I have hurt ___ by saying something very mean. [a family member, a coworker, a friend]	Le he hecho daño a ___ al decir algo muy malo. [un miembro de mi familia, un/a compañero/a de trabajo, un/a amigo/a]	I have stayed in contact with ___ through social media. [a family member that lives far away, an old classmate, a friend from childhood]	Me he mantenido en contacto con ___ a través de las redes sociales. [un miembro de la familia que vive lejos, un/a compañero/a de clase viejo/a, un/a amigo/a de la infancia]

Table A7 (Continued)

Intrusive Items Used in Experiment 5

Embarrassing Topic in English (Native)	Embarrassing Topic in Spanish (Nonnative)	Neutral Topic in English (Native)	Neutral Topic in Spanish (Nonnative)
I feel embarrassed by my family because of ___. [their education level, their opinions and personality, the things they say]	Me siento avergonzado/a por mi familia por ___. [su nivel educativo, sus opiniones y personalidad, las cosas que dicen]	I like my family because they ___. [are fun, support my dreams, care about me]	Me gusta mi familia porque ellos ___. [son divertidos, me apoyan mis sueños, se preocupan por mí]
While I sleep, I dream of___. [hurting people, having sex, being naked]	Mientras que duermo, sueño de ___. [herir a la gente, tener sexo, estar desnudo/a]	While I sleep, I dream of ___. [eating food, flying, swimming]	Mientras que duermo, sueño de ___. [comer comida, volar, nadar]

Table A8

Items Used in Experiments 6 and 7

Behavior type	Beijing stimuli (Nonnative English)	Beijing stimuli (Native Chinese)	Israel stimuli (Nonnative English)	Israel stimuli (Native Hebrew)
Control	Ballroom dancing	社交舞	Participating in a dance class	השתתפות בשיעור מחול
Control	Dining at a Michelin starred restaurant	在米其林星级餐厅用餐	Eating at a celebrity chef's restaurant	אכילת ארוחה במסעדה של שף מפורסם
Control	Eating Peruvian food	吃秘鲁菜	Eating South American food, such as Brazilian or Argentinian food	אכילת אוכל דרום אמריקאי, כמו אוכל ברזילאי או ארגנטינאי
Control	Running a marathon	跑马拉松	Participating in a sports competition, such as a marathon or swimming race	השתתפות בתחרות ספורט, כמו מרתון או מירוץ שחיה
Control	Being on a helicopter	坐直升机	Riding in a helicopter or hot air balloon	טיסה בהליקופטר או בכדור פורח
Control	Traveling outside of China for more than a month	在中国境外旅行超过一个月	Traveling outside of Israel for more than two weeks	נסיעה מחוץ לישראל ליותר משבועיים
Control	Being on television or the newspaper	出现在电视或报纸上	Being interviewed by the television, radio, or newspaper	להיות מרואיין ע"י הטלוויזיה, הרדיו או העיתון
Control	Being hospitalized for more than one week	住院超过一周	Staying in the hospital for more than one week	שהיה בבית חולים במשך יותר משבוע
Control	Singing in a choir	在合唱团唱歌	Performing music on stage in front of an audience	נגינה על במה מול קהל
Control	Studying part time while having a full time job	在全职工作的同时兼职学习	Studying part time while having a full-time job	למידת מערכת חלקית, תוך עבודה במשרה מלאה

Table A8 (Continued)

Items Used in Experiments 6 and 7

Behavior type	Beijing stimuli (Nonnative English)	Beijing stimuli (Native Chinese)	Israel stimuli (Nonnative English)	Israel stimuli (Native Hebrew)
Sensitive	Taking photos or videos of someone without their knowledge	在他人不知情的情况下拍摄他人的照片或视频	Taking photos or videos of someone without permission	צילום תמונות או סרטוני וידאו של מישהו ללא רשות
Sensitive	Faking someone's signature	伪造他人签名	Faking someone's signature	זיוף חתימה של מישהו
Sensitive	Blaming someone else for your mistake knowing that they would be punished for it	明知他人会受到处罚的情况下将自己的过错归结于他人	Blaming someone for your mistake, knowing that they would be punished for it	האשמת מישהו בטעות שלך, בידיעה שהוא יענש על כך
Sensitive	Lying about or exaggerating your qualifications on a job application	求职申请时撒谎或夸大你的资历	Lying about your qualifications on a job application	לשקר לגבי הכישורים שלך בהגשת מועמדות לעבודה
Sensitive	Keeping money or valuable goods that you found on the street	将街上捡到的钱或贵重物品占为己有	Keeping money or expensive items that you found on the street for yourself	שמירת כסף או פריטים יקרי ערך שמצאת ברחוב לעצמך
Sensitive	Revealing a friend's secret to another person	向另一个人揭露朋友的秘密	Telling a friend's secret to another person	גילוי סוד של חבר לאדם אחר
Sensitive	Making up a serious excuse such as illness or death in the family	捏造严重的藉口，比如家里有人生病或死亡等	Making up a serious excuse such as illness or death in the family	המצאת תירוץ רציני כמו מחלה או מוות במשפחה

Table A8 (Continued)

Items Used in Experiments 6 and 7

Behavior type	Beijing stimuli (Nonnative English)	Beijing stimuli (Native Chinese)	Israel stimuli (Nonnative English)	Israel stimuli (Native Hebrew)
Sensitive	Trying to look at someone else's phone call records, texts, e-mails, or social media account without their agreement	在未有他人同意的情况下尝试看他人的通话记录，短讯，邮件或社交媒体帐户	Peeking at someone's phone without permission	הצצה בטלפון של מישהו ללא רשות
Sensitive	Not returning money that was given to you by mistake at a supermarket or restaurant	不归还超市或餐厅误给你的钱	Keeping money that was given to you by mistake	שמירת כסף שניתן לך בטעות
Sensitive	Illegally downloading music or software from the Internet	从互联网非法下载音乐或软件	Illegally downloading music or computer programs	הורדת מוזיקה או תוכנות מחשב באופן בלתי חוקי

APPENDIX B

Language Background and Gender of Participants in Each Experiment

Table B1

Language Background and Gender of Participants in Each Experiment

Study	Self-reported Native Language Proficiency	Self-reported Nonnative Language Proficiency	Age of Acquisition of Nonnative Language	Months Spent in Country where Nonnative Language is Spoken	Percent Female
1	6.49 (*SD* = 0.50) (1 = *Not proficient*, 7 = *Very proficient)*	5.24 (*SD* = 0.68) (1 = *Not proficient*, 7 = *Very proficient)*	5.06 years old (*SD* = 2.83)	8.54 months (*SD* = 19.0)	76% (*SD* = 0.02)
2	6.54 (*SD* = 0.82) (1 = *Not proficient*, 7 = *Very proficient*)	5.08 (*SD* = 0.93) (1 = *Not proficient*, 7 = *Very proficient*)	5.50 years old (*SD* = 3.16)	4.66 months (*SD* = 22.11)	64% (*SD* = 0.02)
3	6.86 (*SD* = 0.39) (1 = *Not at all fluent*, 7 = *Completely fluent*)	4.81 (*SD* = 0.94) (1 = *Not at all fluent*, 7 = *Completely fluent*)	No data	No data	68% (*SD* = 0.02)
4	6.59 (*SD* = 0.72) (1 = *Not fluent*, 7 = *Very fluent*)	5.07 (*SD* = 1.17) (1 = *Not fluent*, 7 = *Very fluent*)	9.70 years old (*SD* = 6.69)	9.96 months (*SD* = 23.28)	69% (*SD* = 0.02)
5	6.99 (*SD* = 0.04) (1 = *Not proficient*, 7 = *Very proficient*)	4.94 (*SD* = 0.86) (1 = *Not proficient*, 7 = *Very proficient*)	12.86 years old (*SD* = 3.67)	2.38 months (*SD* = 3.41)	65% (*SD* = 0.05)
6	6.62 (*SD* = 0.76) (1 = *Not proficient*, 7 = *Very proficient*)	4.25 (*SD* = 1.47) (1 = *Not proficient*, 7 = *Very proficient*)	10.24 years old (*SD* = 7.38)	9.19 months (*SD* = 28.48)	68% (*SD* = 0.02)

Table B1 (Continued)

Language Background and Gender of Participants in Each Experiment

Study	Self-reported Native Language Proficiency	Self-reported Nonnative Language Proficiency	Age of Acquisition of Nonnative Language	Months Spent in Country where Nonnative Language is Spoken	Percent Female
7	6.94 (*SD* = 0.23) (1 = *Not proficient*, 7 = *Very proficient*)	5.61 (*SD* = 0.87) (1 = *Not proficient*, 7 = *Very proficient*)	7.73 years old (*SD* = 1.85)	3.31 months (*SD* = 5.43)	61% (*SD* = 0.04)

Note. Demographic data was missing from 4 participants in Experiment 2 and 4 participants from Experiment 6. Language proficiency data was missing from 2 participants in Experiment 1.

APPENDIX C

Eligibility Criteria and Replacements or Exclusions for Each Study

Table C1

Eligibility Criteria and Replacements or Exclusions for Each Study

Study	Target population	Eligibility criteria based on language background	Replacements or Exclusions
1	Cantonese-English bilingual from Hong Kong	Native Cantonese speaker who considered Cantonese Chinese to be their dominant language Reported knowing English at an intermediate or above level, and passed a short English reading comprehension test Self-reported English proficiency must not be higher than their self-reported Chinese proficiency Did not grow up speaking English at home Spent most of their childhood in Hong Kong Prospective, Current, or former university student Obtain an English grade of D or below in the HKCEE or HKDSE (both are standardized Hong Kong exams) Preferred traditional over simplified Chinese and could use traditional Chinese at at least a sixth grade level	3 participants participated twice, and their second response was excluded 30 participants did not meet at least one of the eligibility criteria, and were replaced[a]
2	Cantonese-English bilingual from Hong Kong	Same as Study 1	33 participants did not meet at least one eligibility criteria, and were replaced[a]

Table C1 (Continued)
Eligibility Criteria and Replacements or Exclusions for Each Study

Study	Target population	Eligibility criteria based on language background	Replacements or Exclusions
3	Cantonese-Mandarin bilingual from Hong Kong	Native Cantonese speaker Passed a short Mandarin listening comprehension test Self-reported Mandarin proficiency must not be higher than their self-reported Cantonese proficiency Able to read simplified Chinese Cantonese is the language they use most frequently, both generally and with their family	No replacements or exclusions
4	Mandarin-English bilinguals from Beijing	Native Mandarin speakers who considered Mandarin to be their dominant language Reported knowing English at an intermediate or above level, and passed a short English reading comprehension test Self-reported English proficiency must not be higher than their self-reported Mandarin proficiency Did not grow up speaking Mandarin at home	6 participants encountered a glitch in the experiment procedure, and were replaced

Table C1 (Continued)
Eligibility Criteria and Replacements or Exclusions for Each Study

Study	Target population	Eligibility criteria based on language background	Replacements or Exclusions
5	English-Spanish bilinguals from Chicago	Native English speakers who considered English to be their dominant language Reported knowing Spanish at an intermediate or above level, and passed a short Spanish reading comprehension test Self-reported Spanish proficiency must not be higher than their self-reported English proficiency Did not grow up speaking Spanish at home Reported being confident with reading aloud English and Spanish sentences at the required level of vocabulary.	3 participants participated they were told that they were ineligible to participate by the online prescreen, and were replaced
6	Mandarin-English bilinguals from Beijing	Native Mandarin Chinese speakers who report speaking English at an intermediate or above proficiency Did not grow up speaking a lot of English at home Self-rated English proficiency must not be higher than their Mandarin Chinese proficiency	7 participants rated their English proficiency as higher than their Chinese proficiency and were replaced
7	Hebrew-English bilinguals from Israel	Native Hebrew speakers who spoke English at an intermediate level Did not grow up speaking a lot of English at home Self-rated English proficiency must not be higher than their Hebrew proficiency	No replacements or exclusions

[a] I screened participants for language background before and after Experiments 1 and 2. Those who were found to be ineligible after they participated were excluded from analysis and replaced. Analyzing the data with and without exclusions based on language background did not change the results.

APPENDIX D

Pretest Results from Experiment 6

Table D1

Percentage of participants who reported having done each behavior in Pretest 1 for Experiment 6.

Whether item was included in the finalized list	Behavior	Percent of participants who have done this
	Neglecting to tell a sexual partner about a contagious disease from which one is currently suffering	5.1
	Having a romantic interest in someone who is a close blood relative	6.1
	Watching someone while they undressed without their knowledge	10.2
	Skydiving	10.2
	Knowing about or witnessing a serious crime and failing to report it or stop it	13.3
	Stealing money from your family	13.3
	Bribing someone to do you favors by sending gifts or money	14.3
	Scuba diving	14.3
	Being romantically involved with someone else's husband wife boyfriend or girlfriend without being sexually involved	18.4
	Not being fully honest when filing taxes	19.4
	Failing to pay back money you have borrowed	19.4
	Lying about an illness or exaggerating your symptoms so that your doctor would approve a longer sick leave	19.4
	Letting a friend drive after thinking he or she had had too much to drink	20.4
	Cheating on your partner while in a relationship	20.4
Included	Dining at a Michelin starred restaurant	20.4
	Lying about one's income or that of one's family	21.4
Included	Taking photos or videos of someone without their knowledge	21.4
	Fantasizing about having violent consensual sex	23.5

Table D1 (Continued)
Percentage of participants who reported having done each behavior in Pretest 1 for Experiment 6.

Whether item was included in the finalized list	Behavior	Percent of participants who have done this
	Having sex with a person who is married or is in a committed relationship	24.5
Included	Lying about or exaggerating your qualifications on a job application	24.5
Included	Been on television or newspaper	24.5
	Speaking badly about someone for your personal gain	25.5
	Having sexual thoughts about a member of your same sex	26.5
Included	Blaming someone else for your mistake knowing that he/she would be punished for it	27.6
Included	Faking someone's signature	27.6
Included	Trying to peek at someone else's (e.g. a classmate's/boyfriend's/girlfriend's phone, email or social media account without them knowing)	28.6
	Having more than five sexual partners	32.7
Included	Keeping up money or valuable goods (e.g. wallet that you found on the street)	34.7
Included	Making up a serious excuse such as illness or death in the family to get out of doing something	35.7
	Taking office supplies (e.g. stationery) home for personal use	35.7
Included	Not returning money that was given to you by mistake (e.g. at a supermarket or restaurant)	36.7
Included	Revealing a friend's secret to another person	39.8
	Cheating on a test or exam	40.8
	Taking nude pictures of yourself or a partner	43.9
	Littering	45.9
	Copying someone else's homework	51.0
	Using sex toys	53.1
Included	Traveling outside of the country	55.1
	Fantasizing about having sex with more than one person at the same time	57.1

Table D1 (Continued)
Percentage of participants who reported having done each behavior in Pretest 1 for Experiment 6.

Whether item was included in the finalized list	Behavior	Percent of participants who have done this
Included	Playing a musical instrument	64.3
Included	Illegally downloading music or software from the Internet	69.4
	Looking at pornographic material	71.4

Table D2

Percentage of participants who reported having done each behavior in Pretest 2 for Experiment 6.

Whether item was included in the finalized list	Behavior	Percent of participants who have done this
	Skydiving	12.3%
	Seeing the real painting of the Mona Lisa	19.6%
	Scuba diving	19.8%
Included	Ballroom dancing	26.2%
Included	Dining at a Michelin starred restaurant	26.4%
Included	Eating Peruvian food	26.7%
Included	Running a marathon	28.3%
Included	Taking photos or videos of someone without their knowledge	28.6%
Included	Faking someone's signature	29.0%
Included	Blaming someone else for your mistake knowing that he she would be punished for it	29.2%
Included	Lying about or exaggerating your qualifications on a job application	29.5%
	Lying about your income or your family s income	30.2%
	Fantasizing about having violent sex	32.1%
Included	Keeping money or valuable goods (e.g. wallet that you found on the street)	32.1%
Included	Being on a helicopter	32.7%
Included	Traveling outside of the United States for more than a month	34.0%
Included	Revealing a friend's secret to another person	34.9%
Included	Making up a serious excuse such as illness or death in the family to get out of doing something	36.5%
Included	Trying to look at someone else's (e.g. a classmate's/boyfriend's/girlfriend's phone, email, or social media account) without them knowing	36.8%
	Having sexual thoughts about someone of the same sex	37.1%
	Taking office supplies (e.g. stationery) home for personal use	37.4%
Included	Being on television or the newspaper	37.4%

Table D2 (Continued)
Percentage of participants who reported having done each behavior in Pretest 2 for Experiment 6.

Whether item was included in the finalized list	Behavior	Percent of participants who have done this
Included	Being hospitalized for more than one week	37.4%
	Having sex with a person who is married or is in a committed relationship	37.7%
	Winning an award for an athletic achievement	38.1%
	Cheating on a test or exam	38.3%
	Copying someone else's homework	40.0%
Included	Not returning money that was given to you by mistake (e.g. at a supermarket or restaurant)	42.1%
Included	Singing in a choir	43.0%
Included	Playing a musical instrument on stage	43.4%
	Having more than three sexual partners	44.2%
	Breaking a bone in your body	44.9%
	Trying out virtual reality technology	45.3%
	Experiencing food poisoning	50.0%
	Using sex toys	50.9%
Included	Illegally downloading music or software from the Internet	53.7%
Included	Studying part time while having a full-time job	54.3%
	Cooking a meal for more than five people	56.6%
	Looking at pornographic material	65.7%
	Having a pet	71.7%