

POLITICAL IMPLICATIONS OF BILINGUAL COGNITION

BY

WENSHUO ZHANG

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Doctoral Committee:

Professor Brian J. Gaines, Chair
Professor Scott L. Althaus
Professor Damarys Canache
Associate Professor Matthew S. Winters

ABSTRACT

Though more than two-thirds of all children around the world grow up in bilingual environments (Crystal 1997) and more than half of the world's population speak more than one language in everyday life (Grosjean 2010), political science continues to operate under a Chomskian scheme in which language is characterized as "a parsimonious symbol system, [or] a type of mental algebra" (Caldwell-Harris 2014, 2). Simply put, the prevailing assumptions are that language is transparent and trivial, and that no special evaluation of its impact independent of the plain meaning is required. Taken further, this paradigm implies that phrases from different languages will be understood exactly the same way, as long as they are faithful translational equivalents.

However, recent research in cognitive psychology has demonstrated otherwise. Affect research experiments have shown that the emotional impact of negative and taboo stimuli is significantly blunted when a bilingual receives them in a second language (Caldwell-Harris and Ayçiçeği-Dinn 2009, Eilola and Havelka 2010, Hsu, Jacobs and Conrad 2015). Concurrently, researchers studying implicit social cognition have found that whether an ethnic group was viewed favorably by bilingual respondents depended on the language in which they were prompted to express an opinion (Danzinger and Ward 2010, Ogunnaïke, Dunham, and Banaji 2010). More recently, decision research has found that working language affected how bilinguals made moral judgments (Costa *et al.* 2014a) and perceived causality (Geipel, Hadjichristidis, and Surian 2015a).

These findings suggest that language may carry enormous ramifications for the study of political behavior. Decreased affective response in second languages may mean that bilinguals respond less intensely to messages broadcast in their second language. Political advertisements,

perhaps especially attack ads, may lose their efficacy if their keywords and symbols do not provoke a bilingual citizen as intended, or if the bilingual forgets them too quickly. Citizens who must evaluate candidates, issue platforms, or even ballot initiatives in their second language may come to very different conclusions and vote choices than they would in their native language. In bargaining, second language negotiations may enable parties working in a second language to be more objective and willing to take risks in achieving a consensus, as they may be less likely to be provoked by topics that are controversial or hold deep emotional resonance.

From a methodological perspective, if a respondent's response in his second language differs from in his native language, then the investigator will fail in his goal of accurately capturing the opinions and attitudes of the target populations, especially those of minority constituents. Researchers who should be alert to possible effects of language for multilingual respondents must recognize the challenges that lie ahead, either of discerning which attitudes and opinions are "true" ones, or of being able to measure language-specific attitudes.

This dissertation investigates whether a native speaker and a non-native speaker process and react to a language in the same manner. I incorporate recent findings from psychology to explain why speaking native and non-native languages may prompt different modes of cognition, and subsequently, result in observable differences in attitudes and behaviors. I use data drawn from an original survey experiment that I designed and conducted in the People's Republic of China (PRC) in 2013 to draw larger conclusions about the potential impact of bilingualism in the political realm. This survey experiment, the first in political science to vary the working language as an experimental condition, asked university students at Capital Normal University to respond on a battery of questions including both commonly-used as well as original attitudinal and behavioral questions.

The balance of this dissertation comprises three chapters, each organized thematically around findings from a different cluster of psychology research into bilingualism. The first substantive chapter provides a basic primer on the terminology used in bilingualism research and investigates the *L1 affective advantage*, in which one's native language (L1) usually evokes greater affect than one's second language (L2). The L1 affective advantage influences how bilinguals view choices and outcomes in a hypothetical situation, which in turn affects their decision-making. I extend this research further to examine how bilinguals assess the fairness of money sharing proposals in an Ultimatum Game.

The second substantive chapter examines language in regard to the encoding specificity principle, which Tulving and Thomson (1973) defined as the improvement in recall when conditions at the time of encoding match those at the time of retrieval. Its corollary in bilingualism, the *language specificity effect*, asserts that memories are "more likely to be activated by the language in which the original events took place" (Pavlenko 2012, 410). I examine whether self-reported patterns of political discussion and media exposure changed as a function of the working language, and their methodological implications for political behavior research.

The last substantive chapter examines *cultural frame switching*, defined (by Hong *et al.* 2000) as the process through which a bilingual accesses networks of knowledge that are associated with different cultures. Cross-cultural psychologists have demonstrated that changing the working language can change a bilingual's self-perception and influence how he views and relates to different groups of people (Hong *et al.*, Ross, Xun, and Wilson 2002). I investigate whether monocultural bilinguals, a group commonly assumed not to be capable of displaying cultural frame switching, profess different core values, such as prioritizing group harmony over

individual rights and deference toward authority, or different political judgments when the working language changed.

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Chapter 1: Introduction

"Bilingualism and multilingualism are a normal and unremarkable necessity of everyday life for the majority of the world's population" (Romaine 2008, 385). The equation of the nation-state with a monocultural and monolingual citizenry is fast being crushed by increasing human migration and technological innovations that facilitate greater interest and engagement across borders. The most recent Census of the United States, conducted in 2010, found that about 79% of the population spoke only English¹ (U.S. Census Bureau 2013), which constituted a 3% decrease from 2000.

The U.S. Census Bureau anticipates that this number will drop further, as 82% of the population growth through 2050 will come from immigrants for whom English is not mother tongue and their descendants born in this country (Passel and Cohn 2008). Hispanics will account for much of that growth, with 50.5 million residents currently self-identifying as being Hispanic or Latino², and 37.6 million reporting being bilingual in Spanish and English (U.S. Census Bureau 2011). While the Census, frustratingly, does not report how many Hispanics are bi- or multi-lingual, a Pew Research Center study on Latinos (Taylor 2012) found that over 82% of Hispanic adults interviewed report speaking Spanish "very well" or "pretty well", and over 95% of respondents agree that it is either "very important" or "somewhat important" that future generations of Hispanics be able to speak Spanish. As of 2014, Hispanics are the largest ethnic group in the country's most populous state, California, and projections anticipate their accounting for the majority of the state population within two generations (Passel and Cohn 2008).

¹ This is a statistic for the U.S. population over five years of age.

² The United States Census Bureau defines a Hispanic/Latino as "a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race" (U.S. Census Bureau 2013).

While English is the undisputed *lingua franca* of the world today, multilingualism in Anglophone countries continues to rise. The 2011 Canadian Census of Population found that over 17.5% of the population, or at least 5.8 million people, reported speaking at least two languages at home. This is an increase from 2006, when 14.2%, or 4.5 million people did so (Statistics Canada 2011).³ Similarly, the 2011 Australian Census found that 76.8% reported speaking only English at home, and they anticipate that this number will further decrease as immigrants from countries where English is not spoken continue to enter the country in large numbers.⁴ This transition toward mass multilingualism means that Anglophone countries are slowly catching up to the multilingual *status quo* observed elsewhere.

In many countries, particularly postcolonial entities whose borders were arbitrarily drawn rather than organically formed, citizens are bi- or multi-lingual often out of necessity in order to communicate with fellow citizens. India, for example, recognizes over 20 official languages out of a total of 447 spoken. While Indonesian is the official language of Indonesia, estimates place the total number of languages spoken in the island nation at one-tenth of the total number currently spoken in the world (Steinhauer 1994).

Being multilingual, at least in a restricted set of languages, has also become a necessity in the international arena. International organizations such as the United Nations and the International Court of Justice specify a set of official languages and, often, a smaller subset of working languages. The European Union makes all documents accessible to all of its citizens in any of the community's 24 official languages⁵, but its civil servants predominantly use English to communicate among themselves regardless of nationality. Multinational corporations have

³ This increase is not due to changes in rates of French-English bilingualism. Languages that have seen the most increase in home use include Tagalog, Mandarin Chinese, Arabic, and Hindi.

⁴ Australian Bureau of Statistics. 2012. "2011 Census shows Asian languages on the rise in Australian households", June 21, 2012. <http://www.abs.gov.au/websitedbs/censushome.nsf/home/CO-60?opendocument&navpos=620>

⁵ http://ec.europa.eu/languages/policy/linguistic-diversity/official-languages-eu_en.htm

increasingly adopted a common working-language policy, in most cases specifying English, requiring employees to use English for both written and spoken interaction (Harzing and Pudelko 2013). And in academia, "English is today the undisputed lingua franca of scholarly exchange...the language of the most prestigious international conferences and journals, and increasingly the medium of higher-level instruction in universities across the world" (Bennett 2013, 169).

Charlemagne (c. 747-814), the first Holy Roman Emperor, is reputed to have observed that to speak another language is to possess a second soul. With more than two-thirds of all children around the world growing up in bilingual environments (Crystal 1997) and more than half of the world's population speaking more than one language in everyday life (Grosjean 2010), is there a scientific basis to Charlemagne's idea of a second soul? When someone who is bilingual speaks his second (or third, *etc.*) language, do his thoughts and behavior differ from when he speaks his native language? In what ways do they differ?

Surprisingly, insofar as there is a paradigm of language underlying most work in political science, the discipline operates under a Chomskian scheme in which language is characterized as "a parsimonious symbol system, [or] a type of mental algebra" (Caldwell-Harris 2014, 2). Simply put, the prevailing assumptions are that language is transparent and trivial, and that no special evaluation of its impact independent of the plain meaning is required. Taken further, this paradigm implies that phrases from different languages will be understood exactly the same way, as long as they are faithful translational equivalents.

While a few studies in advertising research and public health have investigated the practical consequences of bilingualism, only a handful of papers in political science to date, all conducted in the United States, have investigated whether the choice of language can affect a

person's behavior. All have been framed as public opinion studies, and all but one found significant differences in respondent attitudes as a function of the language of interview. Welch, Comer, and Steinman (1973) found that English-language and Spanish-language interviews produced differences in responses, but that analysis was merely suggestive due to a lack of methodological sophistication and statistical power.⁶ More recent papers have found that the language of interview appears to influence the interpretation of survey questions by Latino respondents even after controlling for measurement error and socioeconomic background characteristics of individual respondents (Pérez 2011), respondent attitudes on other ethnicities and immigration policies (Lee and Pérez 2014)⁷, on attitudes and political knowledge (Pérez 2016), and even on support for gender equality legislation (Pérez and Tavits, unpublished). However, theoretical explanation of these differences is still lacking.

Findings from psychology may provide some needed answers. Both clinical practitioners as well as academic researchers have found that that using different languages can affect a bilingual speaker's perception, cognition, and even behavior. Observations dating back to Freud reported multilingual patients behaving differently depending on the language in use (Pavlenko 2012). There is a very rich literature in psychotherapy that documents how bilingual patients utilize their languages to process trauma (Gumperz and Hernandez 1971, Javier 1989, Javier, Barroso, and Muñoz 1993, Javier and Marcos 1989, Rintell 1984, Rozensky and Gomez 1983, Santiago-Riviera and Altarriba 2002), and also how counselors can take advantage of multiple languages when devising treatment (Aragno and Schlachet 1996, Clauss 1998).

⁶ Welch *et al.* wanted to assess how different aspects of the interview can affect response consistency (116). They interviewed Mexican-Americans in two Nebraska counties. Each respondent had the option of being interviewed in Spanish by a Mexican-American, in English by an Anglo interviewer, or in both languages, both interviewers working together. The language of the interview seemed to affect some responses on healthcare and on politics, but their statistical analysis was rudimentary.

⁷ The data was derived from a national survey that offered Latino respondents the choice of interview languages.

In the academic realm, many subfields have reported similar findings among more ordinary research subjects who were bilingual. Observational studies dating back to the 1960s have reported that individuals fluent in multiple languages, far from merely translating their views, often sound like two completely different people when their views are measured in more than one language (Ervin 1964, Ervin-Tripp 1964, Koven 1998). Similar observations have been made in cross-cultural psychology: for instance, bilingual respondents in Hong Kong were more likely to describe themselves differently or to express approval for very different types of cultural values when the working language changed (Bond and Yang 1982, Trafimow *et al.* 1997, Yang and Bond 1980).

The most significant developments have occurred in experimental psychology, where bilingualism research has developed as a distinctive sub-discipline. While most studies in this area have focused on multiple language acquisition, particularly among young children, researchers have reported that the ease with which a memory can be retrieved as well as the details that can be remembered are both a function of the working language used to prompt recall (Marian and Neisser 2000, Marian and Kaushanskaya 2004). Similar memory effects have been observed in affect research (for review, see Caldwell-Harris 2014), where self-reports as well as physiological measurements have shown that the emotional impact of negative and taboo stimuli is significantly blunted when a bilingual receives them in a second language (Caldwell-Harris and Ayçiçeği-Dinn 2009, Eilola and Havelka 2010, Hsu, Jacobs and Conrad 2015). Concurrently, researchers studying implicit social cognition, or "thoughts and feelings outside of conscious control"⁸, have found that whether an ethnic group was viewed favorably by bilingual respondents depended on the language in which they were prompted to express an opinion (Danzinger and Ward 2010, Ogunnaike, Dunham, and Banaji 2010). Lately, decision research

⁸ <https://implicit.harvard.edu/implicit/aboutus.html>

has also joined the fray, with findings that bilinguals behave in a more economically rational manner when working in a non-native language (Keysar *et al.* 2012, Costa *et al.* 2014a). Aside from being less averse to risk, the most recent research has also shown that the working language affects a bilingual's perception of causality (Gao *et al.* 2015), and perhaps most importantly, his moral judgment (Chan *et al.* 2016, Cipoletti, McFarlane, and Weissglass 2016, Costa *et al.* 2014a, Costa *et al.* 2014b, Geipel, Hadjichristidis, and Surian 2015a, Geipel, Hadjichristidis, and Surian 2015b).

These findings suggest that political science must reevaluate its lack of interest, that Charlemagne's second soul exists, and that it may carry enormous ramifications for our study of political behavior. For example, that the use of a second language is associated with decreased affective response may mean that bilinguals respond less intensely to commercial and political advertisements broadcast in their second language. Consumer research has already found that marketing slogans expressed in a consumer's native language tends to be perceived as being more emotional and is remembered longer than similar slogans in a different language (Putoni, Langhe, and Van Osselaer 2009). Similarly, political advertisements, perhaps especially attack ads, may lose their efficacy if their keywords and symbols do not provoke a bilingual citizen as intended, or if the bilingual forgets them too quickly.

Along similar lines, Keysar *et al.* (2012) speculated that if "affect play an important role in decision making and in consideration of risk....[then] people who routinely make decisions in a foreign language rather than their native language might be less biased in their savings, investment, and retirement decisions" (667). Citizens who must evaluate candidates, issue platforms, or even ballot initiatives in their second language may come to very different conclusions and vote choices than they would in their native language. In bargaining, second

language negotiations may enable parties working in a second language to be more objective and willing to take risks in achieving a consensus, as they may be less likely to be provoked by topics that are controversial or hold deep emotional resonance.

In the survey realm, both academic and professional, if a respondent's response in his second language differs from in his native language, then the investigator will fail in his goal of accurately capturing the opinions and attitudes of the target populations, especially those of minority constituents. In the extreme, one might re-conceive of opinions as vectors, not scalars, for multi-linguals capable of accessing quite different considerations as they shift languages. In the United States, the alternate survey language that is commonly offered is Spanish⁹, in recognition of the growing importance of the Latino voting bloc. Surveys outside of the United States vary wildly in their language policy, ranging from offering a selection of the country's most widely spoken or official languages (*e.g.* in Canada, Bolivia, Belgium) to offering only the national language (*e.g.* the People's Republic of China¹⁰). Researchers who should be alert to possible effects of language for multilingual respondents must recognize the parallel challenges of discerning *which* attitudes and opinions are "true" ones, or of somehow measuring language-specific attitudes. Looking forward, political scientists may have to entertain more careful considerations of the population that a survey *can* reach in any one language against the implications of administering that survey in a combination of languages. Experimental research

⁹ Pew Research Center and Gallup both offer Spanish-language interviews, though whether the option is offered to anyone whose primary language is not Spanish is unknown (<http://www.gallup.com/201194/gallup-daily-work.aspx>). Besides Hispanic-specific surveys such as the Latino National Political Survey (LNP) (1989-1990) and the Latino National Survey (LNS) (2006), major survey projects like the General Social Survey (GSS) and the American National Election Studies (ANES) now routinely offer respondents the choice of interview language to Spanish speakers.

¹⁰ To date, no cross-national surveys that interview respondents in the PRC have included respondents from Tibet or Xinjiang. The official justification is that there are not enough field workers trained in local languages to cover these regions sufficiently, though the political logic for excluding the regions is obvious.

shares many of these same risks, especially if participants in their second language behave in a manner contrary to how they would behave in their native language.

This dissertation investigates whether a native speaker and a non-native speaker process and react to a language in the same manner. In other words, I evaluate whether bilinguals do possess a "second soul". I incorporate recent findings from psychology to explain why speaking native and non-native languages may prompt different modes of cognition, and subsequently, result in observable differences in attitudes and behaviors. I use data drawn from an original survey experiment that I designed and conducted in the People's Republic of China (PRC) in 2013 to draw larger conclusions about the potential impact of bilingualism in the political realm. This survey experiment, the first in political science to vary the working language as an experimental condition, asked university students at Capital Normal University to respond on a battery of questions including both commonly-used as well as original attitudinal and behavioral questions.

My choice of participants allows me to control for language acquisition, language proficiency, and language use. In the People's Republic of China, English instruction is ubiquitous as well as relatively uniform in its implementation. English-language education begins in primary school¹¹, and English proficiency is assessed on university entrance exams. Moreover, the government requires a certain level of English proficiency before an undergraduate can receive a diploma.¹² Thus, Mandarin Chinese-English bilingualism¹³ is

¹¹ Some parents enroll their children in extra English education both before the start of school and as a supplement to official instruction.

¹² Non-English major must pass level four of the College English Test (CET), the standardized national exam for English fluency, while English majors must pass level six. Grade 4 is approximately high-intermediate English proficiency. However, see the next footnote for caveats on variations in proficiency.

¹³ As with most foreign language learners, these students are more proficient at listening and at reading comprehension than they are at writing or speaking. During various trips to China over the last ten years, I have interacted with many university students. English education in China seems to prize comprehension over fluency in use. In my interactions, I have observed that university students, on average, possess a medium-to-high reading

prevalent among university students. All of these conditions create a participant pool with relatively more homogenous linguistic backgrounds than has been assembled before.

The balance of this dissertation comprises three chapters, each organized thematically around findings from a different cluster of psychology research into bilingualism. The first substantive chapter investigates the *L1 affective advantage*, in which one's native language (L1) usually evokes greater affect than one's second language (L2). The L1 affective advantage influences how bilinguals view choices and outcomes in a hypothetical situation, which in turn affects their decision-making. I extend this research further to examine how bilinguals assess the fairness of money sharing proposals in an Ultimatum Game. In addition, the chapter provides a basic primer on the terminology and concepts used when discussing bilingualism.

The second substantive chapter examines language in regard to the encoding specificity principle, which Tulving and Thomson (1973) defined as the improvement in recall when conditions at the time of encoding match those at the time of retrieval. Its corollary in bilingualism, the *language specificity effect*, asserts that memories are "more likely to be activated by the language in which the original events took place" (Pavlenko 2012, 410). I examine whether self-reported patterns of political discussion and media exposure changed as a function of the working language, and their methodological implications for political behavior research.

The last substantive chapter examines *cultural frame switching*, defined (by Hong *et al.* 2000) as the process through which a bilingual accesses networks of knowledge that are associated with different cultures. Cross-cultural psychologists have demonstrated that changing the working language can change a bilingual's self-perception and influence how he views and

ability and somewhat comparable listening ability. By comparison, though their vocabulary knowledge is high, their writing and speaking abilities are usually at or below the intermediate level.

relates to different groups of people (Hong *et al.*, Ross, Xun, and Wilson 2002). I investigate whether monocultural bilinguals, a group commonly assumed not to be capable of displaying cultural frame switching, profess different core values, such as prioritizing group harmony over individual rights and deference toward authority, or different political judgments when the working language changed.

Chapter 2: Cognitive Processing

*"If you talk to a man in a language he understands, you talk to his mind.
But if you talk to him in his own language, you talk to his heart."*

Nelson Mandela (1918-2013)

While at the prison on Robben Island, Nelson Mandela began learning Afrikaans in order to better communicate with his prison wardens (le Cordeur 2015). Afrikaans, the language of the white Afrikaner minority and the Apartheid government, held such stigma among the black South African community that many refused to speak or even learn it. According to Saths Cooper, a fellow prisoner, "[Mandela] argued it was all a question of knowing your enemy.... His position was that you had to know their language, their passions, their hopes and their fears if you were ever going to defeat them."¹⁴

Once the Apartheid government had been defeated, Mandela needed the cooperation of the Afrikaner community to ensure a smooth political transition. Against the more strident voices calling for retribution, including those of his estranged wife, Mandela instead cultivated a policy of inclusivity in his government, such as appointing former Apartheid officials to the transition government and overseeing the formation of a Truth and Reconciliation Commission to investigate politically motivated crimes that had been perpetrated by both the former government and the African National Congress (ANC).

Speaking Afrikaans became a key tool in Mandela's outreach arsenal. While most of his local audience could have just as easily understood him in English, one of South Africa's two *lingua franca*¹⁵ and one that was less politically fraught than Afrikaans, his speaking the native language publicly extended an olive branch to much of the white minority. In the Apartheid era,

¹⁴ Hanna, Mike. 2013. "Mandela's art of 'understanding the enemy'." *Al-Jazeera*, December 6, 2013. <http://www.aljazeera.com/indepth/features/2013/06/201368131236612731.html>

¹⁵ The other is isiZulu, also known as the Zulu language.

information about Mandela came primarily from the heavily censored white press, which casted him as a vengeful specter bent on destroying all whites. This image persisted even as Apartheid policies were dismantled. For Afrikaners, Mandela speaking Afrikaans was an incongruous image that disrupted the pervasive fear that many Afrikaners felt about him. Furthermore, being able to listen and speak to their new leader in Afrikaans made them more comfortable and willing to consider his ideas. In one notable incident, when three generals of the Afrikaner Defence Force asserted their stated willingness to fight against the ANC forever, Mandela spoke Afrikaans to them, countering with the observation that a complete victory by either side was pointless. Instead, he managed to persuade the generals to consider negotiations that would integrate the Afrikaner community into a larger, more inclusive vision of South Africa.¹⁶

For Mandela, speaking his constituents' native language was also a shrewd strategy with which he could forge a more genuine and personal connection. However, at times the audience could be taken off guard by the intense and unexpected emotions that were elicited. Zelda Le Grange, who became one of the private secretaries in the President's office after Mandela took office, described her reaction upon their first meeting:

...[A]fter I settled my thoughts or guts---I'm not sure which---I realized that he had addressed me in Afrikaans....I was completely over taken by emotion and couldn't continue. I then had a feeling of guilt that swept over me. I felt guilty that this kindly spoken man with gentle eyes and generosity of spirit spoke to me in my own language after 'my people' had sent him to jail for so many years. I instantly regretted voting 'No' in the referendum. How do you correct all of that prejudice in five minutes? Suddenly, I wanted to apologize. (Le Grange 2014, 28-29)

Mandela's multilingual background¹⁷ and his incarceration at Robben Island had set the stage for the vital realization that the language that he spoke was just as important as the words that he used to convey his ideas. Communicating with his constituents in their native language publicly

¹⁶ This anecdote was cited in an *Independent* article (<http://www.independent.co.uk/voices/comment/as-afrikaners-we-were-scared-of-what-mandela-would-do-to-us-how-wrong-we-were-9004171.html>), but I was unable to trace the provenance of this story further.

¹⁷ Mandela spoke Xhosa, English, and Afrikaans (le Cordeur 2015).

signaled his willingness to engage with them, and at the same time, seemed to make his listeners more psychologically predisposed to listen to him.

In countries such as the United States, where citizens whose first language is not English have become a formidable voting bloc to be courted, politicians and pundits increasingly incorporate native language outreach as an essential part of their political strategy. While isolated examples of bilingual campaign media existed as far back as the 1960 election, during which First Lady Jacqueline Kennedy Onassis made a Spanish-language political advertisement¹⁸, by 2000, both Al Gore and George W. Bush were regularly putting out websites, political advertisements, and soundbites in Spanish.¹⁹ The 2016 Democratic Vice Presidential candidate, Tim Kaine, recently made election history by delivering a speech entirely in Spanish.²⁰ Much like Mandela, Kaine aimed not only to facilitate understanding in his Hispanic audience, but also forcibly to suggest a deep connection between his ticket (the Democratic Party) and their communities.

Psychologists, rhetoricians, and linguists have long known that some words evoke stronger emotional reactions in the listener (Altarriba and Bauer 2004), and over the last thirty years, they have come to the consensus that bilinguals feel more strongly when working in their native language as opposed to a second language. This idea, called the *L1 affective advantage*, is rooted in research into embodied cognition. In short, the main idea is that "the mind must be understood in context of its relationship to a physical body that interacts with the world" and such that "human cognition, rather than being centralized, abstract, and sharply distinct from

¹⁸ <https://www.youtube.com/watch?v=65-11oubBsl>

¹⁹ Puente, Maria. 1999. "Bush, Gore using bilingual approach." *USA Today*, August 30, 1999. <http://usatoday30.usatoday.com/news/e98/e250.htm>

²⁰ Klein, Betsy. 2016. " Kaine makes history: Delivers speech entirely in Spanish during Spanish-language church service." *New York Times*, October 16, 2016. <http://www.cnn.com/2016/10/16/politics/tim-kaine-florida-miami-church-spanish/>

peripheral input and output modules, may instead have deep roots in sensorimotor processing" (Wilson 2002, 625). Language acquisition occurs alongside the maturation of emotions and the development of memory in a young child; in other words, a child learns how to describe the world at the same time that they are learning to process and to react to it (Bloom and Beckwith 1989). Sense memories are thus more integrated with a first language, and words in that language will more forcefully call up emotions and memories than can second languages learned later in life.

While the link between affect and bilingualism, particularly how a bilingual's behavior can be shaped by the L1 affective advantage, is a relatively new topic of inquiry, decision research has already found that how people make judgments and decisions can be greatly affected by whether a situation is reported in a first language versus a second language. Several studies have found that bilinguals are less afraid of risk and uncertainty in a second language (Keysar, Hayakawa, and An 2012, Costa *et al.* 2014a), and a series of recent papers suggest that bilinguals consider moral dilemmas differently in a second language, such as being less likely to condemn morally reprehensible acts (Geipel, Hadjichristidis, and Surian 2015).

While most political science research involves no explicit thinking about language, these findings from psychology suggest that bilingualism may in fact constitute a major source of influence on political behavior. Putoni, Langhe, and Van Osselaer (2009) reports that bilingual consumers tend to perceive native-language marketing slogans as being more emotional and to remember them better; bilingual voters may react similarly when viewing political advertisements. Along the same lines, voters rely on their judgments about the performance of their country and their leaders when deciding how to vote. However, if the working language can modify their judgment, then it stands to reason that their vote can change as well.

This chapter examines whether evaluations of fairness may be affected by the choice of working language. I conduct a survey experiment, the first of its kind in political science, to study if language alters behavior of Chinese-English bilinguals participating in an Ultimatum Game scenario. Participants took on both roles, so that they first chose two-way divisions of a quantity of money, as take-it-or-leave-it offers to a single counter-part, and then also chose to accept or reject various offers, as could be made by another player. As societies become larger but the pool of resources remains constant, the diverse demands upon the resources mean that citizens are sometimes asked to accept proposals that result in outcomes unfavorable to them (Alford and Hibbing 2004, 62). I extend the methods and findings first developed in decision science research into the realm of political science, studying whether bilingualism affects the participant's tolerance for unfairness and their willingness to punish selfish parties.

The first section provides an overview of bilingualism, starting with the presentation of a basic academic vocabulary for discussing bilingualism and bilinguals. The second section reviews the extant literature in psychology on the connection between affect and bilingualism, before moving on to discuss language-mediated behavioral changes that have been observed in affect research and decision research. The third section briefly discusses the survey experiment that provides the data for this dissertation. The fourth section presents three experimental modules that examine decision-making, with the working language as the experimental treatment. The first two modules replicate previously conducted experiments on the perception of risk and uncertainty, using a bilingual speaker population not previously assessed in the literature. The purpose of these replications is to confirm whether previously reported divergences in cognition can be replicated in the new speaker population. The third component

then moves on to assess whether the bilingual speakers exhibit noticeable differences in how they perceive and behave in an "unfair" scenario.

What is bilingualism?

When speaking of someone as being bilingual, we generally mean that person being discussed has the capacity to speak (and understand, and sometimes read and write) at least two languages.²¹ Bilingualism researchers, however, generally define a bilingual as someone who uses multiple languages in his daily life. While the lay definition usually assumes high proficiency in the speaker, the academic definition emphasizes frequency and context of use (Pavlenko 2013, 406). This dissertation, unless otherwise explicit, uses the academic definition.²²

Humans are born with the capacity for language. "[Y]oung children pay very close attention to the variable nature of [verbal] input" in their environment (DeHouwer 2005, 33). Babies as young as 4.5 months old are able to recognize when their caregivers switch languages, "even when [the languages] are rhythmically very similar" (Ellis 2005, 5). However, a child's recognition of a person switching among different languages does not mean that he automatically will know what these languages are. While a child acquires the ability to communicate early²³, the ability to mentally differentiate between language systems develops later, by fourteen to twenty-one months of age (5).

²¹ To avoid cumbersome conjunctions such as "bilingualism and/or multilingualism", academic conventions use "bilingualism" as the umbrella term when referring to the knowledge and usage of two or more languages. I have adopted this convention throughout this dissertation. I will, however, note the ability to speak *more* than two languages if the distinction proves important.

²² Many bilingual speakers around the world are forced to use a poorly mastered second language due to economic or political pressures. Adhering to the lay definition limits academic attention to expert linguists, which then ignores the modal experience of operating in an "extra" language. Within the set of bilinguals, of course, those who are extremely proficient and comfortable in both (all) of their languages will sometimes be worthy of additional attention. Whether they differ in degree or in kind from the more numerous set of people who have some, imperfect skill in a language routinely used is frequently an interesting question, albeit a secondary one.

²³ Babies can use sign language much earlier than they can speak, as brain development and muscular control over their hands matures faster than the vocal cord (Thompson *et al.* 2007).

Bilingualism is not a uniform phenomenon, and bilingualism research differentiates between different types of bilinguals on the basis of linguistic repertoire, age of first exposure to a second language, environment of exposure, and so on. Researchers tend to emphasize age and linguistic environment in which bilinguals first learned and/or use their second languages to infer the speaker's linguistic proficiency.²⁴ The native language, also known as L1, is the primary language to which a child is exposed between infancy and about three years of age, regardless of his current proficiency. Children who are exposed to multiple languages during this period have multiple L1. Languages acquired after this period are called second languages, or L2. Second languages are labeled in the order of acquisition (L2, L3, *etc.*) or spoken of generally as additional languages (LX), regardless of whether learners are exposed their languages sequentially or simultaneously.²⁵ The common academic practice refers to all languages after L1 as "second" languages in discussion.

With regard to the acquisition phase, the *age of acquisition* (AoA) is the age at which a person begins to learn a language. It is usually collapsed into a three-way, ordered scheme distinguishing between *simultaneous*, *childhood*, and *late* bilinguals. A simultaneous bilingual is an individual who acquired multiple languages from birth; in this case, the individual does not have L1 and L2(s) but, rather, multiple L1s. Childhood bilinguals are individuals who began to

²⁴ A popular alternative in psychology (D'Acerno 1990) emphasizes the comparative acquisition context of different languages but largely ignores other factors. *Compound bilinguals* learn multiple languages in the same environment, meaning that the languages are mentally part of a single amalgamated linguistic construct. By contrast, *coordinate bilinguals* learn their multiple languages in different environments, such as a foreign language learner learn one language in the home and another in the classroom; in this scheme, words of different languages are mentally classified as belonging to two different linguistic constructs. The *sub-coordinate bilingual* is similar to the *coordinate bilingual* in acquisition environments but assumes that one language dominates over the other. For this dissertation, I will use the description system favored by bilingualism research, as it can convey information about linguistic acquisition and proficiency more accurately than the typology described here.

²⁵ Experimental psychology often refers to "foreign languages" (FL) as opposed to "second language" (L2). Bilingualism research does not make a distinction between FL and L2 except with regard to the context of acquisition, discussed below.

learn L2 in their childhood, before puberty²⁶ (generally operationalized, with some imprecision, as twelve years of age). Late bilinguals are thus the remaining case of those people who begin to learn a second language after puberty. The two latter types, especially if there is a considerable length of time between gaining proficiency in L1 and acquiring L2, are also called *sequential bilinguals*.

The *context of acquisition* (CoA) is defined as the linguistic environment in which a person learns a second language. Possible contexts for L2 acquisition consist of the instructed context (also known as the foreign-language context), the naturalistic context (the L2 context), and the mixed context. The instructed context produces *foreign-language learners*, in which learners are learning the language spoken in another country or community. In the United States, the typical foreign-language context is the foreign-language class, in which students are exposed to the target language (TL) (almost) exclusively during set class periods. An instructor independently determines the vocabulary and grammatical features to be learned, and the class period is usually devoted to integrating the new lesson content into the student's existing knowledge of the language. The traditional FL context usually involves the learner memorizing large amounts of vocabulary and grammar and displaying his proficiency via structured examinations.

The naturalistic context is also known as immersion, in which *second language learners* acquires a language in an environment in which it is the predominant language of use. Necessity often drives the acquisition of new vocabulary and grammar skills, and learners acquire skills by repeated trial and error. When learning about a speaker's learning experience in this type of

²⁶ Researchers have argued that the critical-period hypothesis (Lenneberg 1967), in which neuroplasticity in the developing brain facilitates language acquisition in children between infancy and five to seven years of age, also applies to second-language learners. Under this classification, bilinguals who are exposed to a second language outside of this time period would all be considered "late" bilinguals".

context, key pieces of information include the learner's *age of arrival* as well as the *length of residence* in this context. While naturalistic contexts are usually communities where use of the target language predominates, as experienced by migrants, travelers and the like, they can also be artificially created. For example, the Middlebury Language Schools requires all enrolled students to pledge to "listen, speak, read, and write the language of study as the only means of communication for the entire summer session."²⁷

However, Middlebury is not a purely naturalistic context, as the program incorporates classroom instruction to introduce new linguistic content to the learner, better exemplifying the mixed context. Other examples of the mixed context include foreign language-based study abroad programs run by many American universities, which combine intensive classroom instruction with social reinforcement in the target language environment. However, given the prevalence and social desirability of speaking English around the world, maintaining the insularity of a strictly naturalistic social context is now very unlikely for a member of such a program.

To understand a bilingual speaker's *language proficiency*, or overall skill level in a particular language, researchers may assess or ask the speaker to assess his own ability in reading, writing, speaking and listening. The results determine whether a speaker is a *balanced bilingual*, who displays relatively similar facility with all of his languages, or a *dominant bilingual*, who displays greater proficiency in some languages over others²⁸.

Most bilinguals are dominant bilinguals, as social or economic concerns may force them to interact regularly in only one language. However, Grosjean (2008) observes that bilinguals will use different languages in response to the audience and the situation at hand, such as using

²⁷ <http://www.middlebury.edu/languages/language-pledge>

²⁸ It is important to keep in mind, however, that balance and dominance are polar opposites on a spectrum, and most bilinguals are never purely balanced or purely dominant.

L1 with family members and L2 with work. Such differential social demands in turn influence how often a speaker may use a language as well as his languages' respective *domain(s) of competence*, or the subjects in which a speaker is most proficient in a particular language. For example, a bilingual accountant may be very fluent when talking about his job in L2 and also display very low aptitude when talking about politics, which is a part of home life that is usually conducted in L1.

To demonstrate how to apply these terms in practice, consider the linguistic background of Barack Obama, who speaks English as his L1 and some Indonesian (Bahasa Indonesia) as an L2. President Obama was born in 1961 to an American mother and a Kenyan father in Hawaii. His L1 is English.²⁹ Obama is a *childhood bilingual* with regard to Indonesian, having moved to Indonesia at the age of six, his *age of arrival*, to acquire the language in a *naturalistic context*. As he moved back to Hawaii at the age of ten, his *length of residence* in the naturalistic context was four years. Except for conversations with family and on trips back to Indonesia, including his 2010 state visit to Jakarta, Obama has largely stopped speaking Indonesian, making him a dormant bilingual, or someone who has the capacity to use several languages but now uses only one in his life.³⁰ However, even if Obama had continued to speak Indonesian, his greater proficiency in English and the need to interact with both his family and workplace in this language marks him as a *dominant bilingual*. As a community organizer and then as a politician, Obama has had more opportunities than most to interact with others for whom English is not

²⁹ Perhaps surprisingly, given that Obama has authored two autobiographies and his personal history has aroused enormous interest and attention, no information is available on whether he should be regarded as a simultaneous bilingual due to any exposure to his father's native languages or to the Hawaiian language. Only one American president to date did not have English as L1; Martin van Buren's mother tongue was Dutch, though he learned English (fluently) as a young child.

³⁰ <https://www.psychologytoday.com/blog/life-bilingual/201011/dormant-bilinguals-and-president-obama>

their primary language. However, it seems clear that Obama's day-to-day interactions are conducted almost entirely in English.

Different types of bilingualism are often associated with a particular context of acquisition. While simultaneous bilinguals acquire their languages in immersive contexts, a greater variety of acquisition experiences are available to childhood and late bilinguals. The archetypal "fish out of water" background throws a person into a new linguistic context, in which he must puzzle out how to communicate by trial and error. However, education plays an increasing role in how people learn languages, with many students often required to learn at least one foreign language, such as in the European Union, where 77% of primary school students learn English as a second language.³¹ Having bilingual parents may not guarantee a convivial environment for the acquisition of both languages. For example, children raised in immigrant families may sometimes come into contact with the official language of their country only when they go to school³²; the opposite pattern may sometimes be observed as well, such as bilingual parents refusing to speak their home languages to their children, leaving them to learn about their heritage and the associated language later in life, often in a classroom setting.

The crucial difference between contexts of acquisition lies in the association that bilinguals form between emotions, experiences, and the words in a particular second language. The next section will discuss how these differences in associations accrue to become the L1 affect advantage and how it has been observed to affect individual behavior.

³¹ <http://www.pewresearch.org/fact-tank/2015/10/08/more-than-any-other-foreign-language-european-youths-learn-english/>

³² <http://www.npr.org/sections/ed/2016/10/13/492860463/born-in-the-u-s-raised-in-china-satellite-babies-have-a-hard-time-coming-home>

Bilingualism in affect research

Studies about the connection between affect and bilingualism began in experimental psychology as an extension of memory and cognition research.³³ At the time, psychologists disagreed over whether lexical memory, or the memory of words and morphemes³⁴, would be equally retrievable regardless of the language used to prompt it. In the common representation view, information about words, including definitions and connotations, would be equally retrievable regardless of the working language (for example, see Kolers and Gonzalez 1980); by contrast, the language-specific representation view held that different working languages would retrieve unique sets of details about that same word (for example, see Watkins and Peynrcöglu 1983).

Attempts to mediate between the two sides like Durgunoğlu and Roediger (1987) suggested a more flexible view of memory, arguing that the purpose of the recall task may determine the kinds of memory representations that are activated. For example, data-driven tasks such as free recall, in which a subject is asked to recall previously given content in any order that he desires, would activate language-specific representations, while conceptually driven tasks such as meaning-based searches, in which a subject is invited to retrieve specific items from memory based on a target definition, activated common representations.

Anooshian and Hertel (1994) aligned with the compromise view, proposing a more nuanced consideration of memory, in which "[l]inguistic specificity should be found when a particular language is a discriminative and ecologically important aspect of prior experience"

³³ Earlier studies in sociolinguistics had already observed that bilingual speakers varied the presentation and content of their speech depending on the language that they are speaking (Ervin 1955, Ervin-Tripp 1964). Ervin-Tripp, however, postulated that these differences were the result of differences in interpretive framing as a function of language and culture, not evidence of differences in affect. These assertions will be explored in more detail in Chapter 4.

³⁴ Morphemes are grammatical units in which "there is an arbitrary union of a sound and a meaning that cannot be further analyzed" (Fromkin and Rodman 1974[1988], 70). Words in a language are composed of one or more morphemes.

(504). In their view, the degree to which words or phrases in a language are associated with strong emotional experiences determined the type of memory representation that is recalled as a function of language.

For monolinguals, emotion is associated with only one language. Previous experiments have already demonstrated that emotional words provoke higher autonomic reactivity (Dinn and Harris 2000), are better remembered (Altarriba and Bauer 2004, Ferré 2003), and capture more attention than neutral words (Algom, Chajut, and Lev 2004, Huang, Baddeley, and Young 2008). Anoshian and Hertel proposed an extension of these findings to the realm of bilingualism, arguing that childhood and late bilinguals, or bilingual speakers who had been monolingual during their earliest years, should be more likely to associate emotion with their native language (L1) because they first learned to associate and express affect in them. As "prior experience establishes the ways in which new events of a similar type are processed" (505), these individuals will continue to prefer L1 for processing emotional experiences even after becoming bilingual.

The authors found that bilinguals who acquired fluency in a second language³⁵ after eight years of age were more likely to rate emotional words such as "mother" or "church" as having much stronger emotional associations than neutral words such as "table" in their respective L1³⁶, and that they were more likely to recall emotional words that had been given in L1. With respect to the dispute on memory representation, their experiment demonstrated that conceptually-driven recall tasks, which had been thought to activate only common

³⁵ The phrasing in the article does not make it clear whether their speakers began to learn L2 or whether they only achieved a certain level of fluency after eight years of age.

³⁶ Harris (2004) found that simultaneous bilinguals exhibited similar electrodermal responses (or skin conductance responses, SCRs) when exposed to emotional words in either of their native languages.

representations, can in fact evoke language-specific presentations when the objects being recalled have different levels of emotional association in different languages.

In arguing that how a person experiences a language affects the type of memory that a language can call up, Anoshian and Hertel aligned with neuroscientists who advocated for a concept known as embodied cognition (for review, see Wilson 2002), the ideas that "the mind must be understood in context of its relationship to a physical body that interacts with the world" and that "human cognition, rather than being centralized, abstract, and sharply distinct from peripheral input and output modules, may instead have deep roots in sensorimotor processing" (625). In particular, their arguments about language and emotion articulated a very simple version of what would become known as *language embodiment*, in which "affective socialization in early childhood [functioned] as the process of integration of phonological forms of words and phrases with information from visual, auditory, olfactory, tactile, kinesthetic, and visceral modalities, autobiographical memories, and affects" (Pavlenko 2012, 421). In a young child, language acquisition happens simultaneously with the development of the limbic system and autobiographical memory, so that children are essentially learning how to describe the world at the same time that they are learning how to process it (Bloom and Beckwith 1989). Sense memories are thus intertwined with a first language, and when a person uses a first language, those words can call up those emotions and memories that he most strongly associate with its learning or use.

Anoshian and Hertel's work inspired a wave of subsequent studies that studied the extent of the association between bilingualism—specifically, the languages in a bilingual's repertory—and affect. The research began as modified reproductions of the original

experiment (Ayçiçeği and Harris 2004, Harris 2004, with Ferré *et al.* 2010³⁷ as an exception), where the presence of increased affect in L1 was inferred from the strength of self-reported ratings on affect intensity of the stimuli as well as the memory advantage. Significant variations in their respective research designs make it difficult to discern whether the lack of consensus in the results should be attributed to inadequate theory or variations in execution. Anooshian and Hertel (1994) and Ferré *et al.* (2010) utilized written, single-word stimuli while the other two instead chose to use audio recordings of emotional phrases. Faithful reproductions did not garner expected results, however, as Ferré *et al.* (2010) reporting no effect and the two experiments utilizing a different stimuli (Ayçiçeği and Harris 2004, Harris 2004) found in favor of greater recall of emotion words in L1 and a small scale of improvement in L2.

Subsequent works increasingly focused on more nuanced assessments of the intensity of the L1 affective advantage. The recall task used in the earlier experiments was retired in favor of other psychological assessments, such as the emotional Stroop task (Eilola and Havelka 2010, Eilola, Havelka, and Sharma 2007), which measures the speed at which an experimental subject can name the color of emotional or neutral experimental stimuli to infer the magnitude of interference that affect has on cognition, or the Implicit Affective Association Task (IAAT) (Degner, Doycheva, and Wentura 2012³⁸, Segalowitz *et al.* 2008), which assesses the degree of automatic processing that a person performs when exposed to affective stimuli in either L1 or L2. Results from this group of experiments are mixed, with Eilola, Havelka and Sharma (2007) as well as Eilola and Havelka (2010) finding no observable behavioral differences as a function

³⁷ One related experiment by Ivaz, Costa and Duñabeitia (2016) indirectly investigated the link between affective embodiment and language by assessing recall of "ego-centric" words, which "enhance performance by boosting memory, speed, and accuracy as compared with stimuli unrelated to the self (the so-called self-bias effect)" (490). They found that Spanish-English bilinguals did indeed exhibit a "robust asymmetry" in the "self-bias in the native- and foreign-language contexts" (490).

³⁸ While Degner *et al.* calls theirs an "affective priming task", the description of the experimental procedure is functionally similar to that of Segalowitz *et al.*'s IAAT design.

of the working language, Segalowitz *et al.* (2008) finding less automatic processing of affective stimuli in L2, and Degner *et al.* (2012) reporting a robust L1 affective advantage. However, the L1 affective advantage was not absolute, as Degner *et al.* also found similar affective priming effects in L2 for participants who had experienced long immersion in their L2.³⁹

These experiments primarily relied on self-reports⁴⁰ and behavioral data to infer the magnitude of an affective advantage in either L1 or L2. Contradictory results as well as the fact that bilinguals can cognitively compensate, even correct, for affective deficiencies in one language or the other drove research toward more direct physiological assessments in order to assess whether bilinguals did actually "feel" more in one language versus another.

Human beings perceive far more of the world than they can consciously access, and human cognition hosts a wealth of unconscious processing lies between the reception of stimuli and conscious processing (Taber and Lodge 2013, 3). Direct assessments measure unconscious arousal that is caused by affect. Methods include measuring autonomic arousal through markers such as heart rate, activation of facial muscles, or skin conductivity, and directly measuring brain activity through neuroimaging techniques. While some of these experiments collected only autonomic arousal data to measure the magnitude of affect elicited by the linguistic stimuli, others also incorporated a cognitive task similar to the aforementioned memory assessment to observe any behavior differences.

Autonomic arousal studies try to capture unconscious processing by inference from monitoring either skin conductive responses (SCR) or skin conductance levels (SCL). "The

³⁹ A third study, Basnight-Brown and Altarriba (2007), reported that a larger L2 affective priming advantage existed among Spanish-English bilinguals. However, the authors reported that the results of the lexical decision task, one that was similar to the IAAT, may have been skewed due to the L1 Spanish speakers consistently reporting that they felt significantly more proficient in L2, and also that they spent the majority of their day using L2 (958).

⁴⁰ The one exception is Eilola *et al.* (2007), which selected neutral, positive, and negative words out of the English version of the Affective Norms for English Words (ANEW) database (Bradley and Lang 1999), with taboo words selected by the researcher as a comparable list did not exist in ANEW. Affect was objectively established by the database, and the participants were not asked to rate the words themselves.

activation of the autonomic nervous system in response to threat cues in the environment increases sweat gland activity...[which] results in greater water content on skin activity, which [then] facilitates electrical conductivity" (Eilola and Havelka 2010, 356). In simpler terms, when a person perceives a threatening cue, the perception of which may not ever reach conscious awareness, he starts to sweat more, which in turn increases skin conductivity.

Both SCR and SCL experiments require electrodes be attached to the experimental subjects, through which the researchers run a small direct current, maintained at a constant strength. Changes in physiological arousal are then registered as changes in the strength of that current. SCRs are measured in relation to each individual stimuli being presented but have substantially longer latency periods, while SCLs measure the changes in the overall level of autonomic response and is more appropriate for studies that require time constraints (Eilola and Havelka 2010, 357). The SCR experiments predominantly add on the measurement of affective arousal as an extension of the original Anouoshian and Hertel experiment (Caldwell-Harris *et al.* 2011, Harris 2004, Harris, Ayçiçeği, and Gleason 2003), though one later entry only asked the participants to read or listen to emotional stimuli in both languages (Caldwell-Harris and Ayçiçeği-Dinn 2009). The only SCL entry is Eilola and Havelka (2010), discussed earlier, which directly measured affective arousal while subjects participated in an emotional Stroop task, designed to infer affective arousal through behavioral changes. The SCR experiments generally include self-assessments for validation.

The results mostly leaned toward confirming an L1 affective advantage, though the type of experimental stimuli capable of triggering this advantage varied. All of the experiments that assessed non-Asian bilinguals (Caldwell-Harris and Ayçiçeği-Dinn 2009, Eilola and Havelka 2010, Harris 2004, Harris *et al.* 2003) found an L1 affective advantage with respect to negative,

reprimand, or taboo words. By contrast, Caldwell-Harris *et al.*'s assessment of Mandarin Chinese-English bilinguals (2011) found that subjects were similar on the aforementioned categories in both languages, though they did discover an L2 affective advantage when subjects listened to endearments. Interestingly, when validating self-reports with SCR data, this study also found that the participants reported the opposite, that L1 Mandarin expressions felt more emotional⁴¹.

Neuroimaging studies that have been conducted use either event-related potential measurements (ERP) or functional magnetic resonance imaging (fMRI) scans to measure changes in brain activity while participants are asked to engage in some cognitive task. As with autonomic arousal studies, neuroimaging studies attempt to capture unconscious processing. ERPs are "voltage fluctuations in the electroencephalogram (EEG) induced within the brain that are time-locked to sensory, motor or cognitive work" (Friedman *et al.* 2001, 356). In other words, according to Bartholow and Amodio (2009), it is an "index of brain activity generated by the firing of cortical neurons" in response to some stimuli (201). By contrast, fMRIs use magnetic resonance imaging to detect changes in blood flow in the brain, which is taken as a proxy for changes in brain activity. As compared to the fMRI, which provides indirect measurements of brain activity, ERPs provide a direct and relatively non-invasive measure of electrical activity in the brain that, in an experimental setting, can be broken down and analyzed for differences among specific neural processes.

⁴¹ It may be worth noting that the interpretation of SCR data is not conclusive, as heightened arousal can be elicited by affect-unrelated causes such as task-related or language-specific demands upon cognition (Caldwell-Harris and Ayçiçeği -Dinn 2009, Caldwell-Harris *et al.* 2011, Pavlenko 2012).

The ERP studies (Chen *et al.* 2015, Conrad, Recio, and Jacobs 2011, Opitz and Degner 2012) tended to stay relatively close to the original research design, measuring ERP⁴² as participants take part in a lexical decision task, namely, identifying whether the stimuli presented in L1 and L2 are real words. Again, the results seemed split by language region, as the studies using European bilinguals⁴³ (Conrad, Recio, and Jacobs 2011, Opitz and Degner 2012) found no reactive differences between languages, though with L2 reactions being slightly slower relative to L1. By contrast, Chen *et al.* (2015) found an L1 affective advantage for positive words in L1 Mandarin Chinese and no delayed in reaction in L2 English.

To date, two fMRI studies have investigated the link between bilingualism and emotion. Chen *et al.*, which also included an ERP component, also conducted an fMRI study while their participants taking part in the same lexical decision task. They found that bilinguals displayed conflicting patterns of brain activation in L1 and L2.⁴⁴ The other study, Hsu, Jacobs and Conrad (2015), discarded the lexical assessment task entirely, instead opting to capture brain activity as participants were asked to read emotional passages from *Harry Potter*. In general, participants rated the more emotional passages, whether happy or fear-filled, as being more emotional in L1, a finding confirmed by fMRI scans that showed stronger neural activity in areas of the brain associated with emotion and memory, such as the amygdala, the hippocampus, and Parahippocampal Cortex (PHC). Interestingly, they found that L2 will activate emotional centers

⁴² To be specific, all three experiments try to identify whether L1 or L2 words elicit a larger early posterior negativity [EPN], as earlier research has suggested that the EPN reflects an automatic sub-process in which emotional words capture the attention for processing later (Kissler *et al.*, 2009; Scott *et al.*, 2009).

⁴³ Conrad *et al.* used German-Spanish and Spanish-German bilinguals while Opitz and Degner used German-French and French-German bilinguals.

⁴⁴ In the middle occipital gyrus, which is associated with visual processing, positive words showed weaker activation than both neutral and negative words in L1 while there was no difference in activation in L2. In the left cerebellum, scans similarly found that positive words showed weaker activation than neutral words in L1, however, the pattern was reversed in L2, with greater activation of neutral words than positive words. The authors also found that negative words in both L1 and L2 were more strongly activated in the left superior frontal gyrus, though neutral words were more strongly activated in the superior parietal lobe. However, they preface this finding with the disclaimer that the function of these areas in emotional information processing is not very well understood (43-44).

of the brain similar to that of L1 activation if a bilingual sufficiently proficient in L2. However, these L2-triggered affect patterns seemed less localized and less consistent than those in L1 (Dehaene *et al.* 1997, Perani *et al.* 1996). In layman's terms, it is as if the bilingual could not feel as intensely or can differentiate as carefully between their feelings in L2, at least at the neurological level.

These experiments have converged on the consensus that a bilingual speaker generally feels more intensely when exposed to emotional words and phrases in his native language as opposed to his second language. However, the difference in affect has not been conclusively shown to affect bilingual behavior, at least with respect to participation in recall tasks or lexical decision tasks. For example, while Eilola, Havelka, and Sharma (2007) found that their participants performed the same on an emotional Stroop task regardless of language, while Eilola and Havelka (2010) found that negative and taboo experimental stimuli evokes significantly larger SCLs in L1 than in L2⁴⁵. Meanwhile, in ERP experiments, while Chen *et al.* (2015) and Conrad, Recio, and Jacobs (2011) both observed faster performance on the lexical activity in L1⁴⁶, Opitz and Degner (2012) found that participants instead performed better in L2. However, as Chen *et al.* and Opitz and Degner discovered independently, this difference in emotional intensity is not predestined or constant, since prolonged immersion and fluency in L2 will establish affective associations similar to those existing in L1.

The consensus around an L1 affective advantage, however, was largely established under highly idiosyncratic assumptions about language. Fundamental to the experiments in the affective research literature is the assumption that demonstrating affect and behavioral

⁴⁵ The two experiments did recruit from different populations of bilinguals. Eilola *et al.* used Finnish-English bilinguals while Eilola and Havelka used English monolinguals and Greek-English bilinguals.

⁴⁶ Specifically, L1 German speakers were fastest in recognizing positive, then neutral, and finally negative words from non-words, while L1 Spanish speakers were fastest in recognizing positive, then negative, and finally neutral words from non-words. L1 Chinese speakers behaved similarly to L1 Spanish speakers.

differences as elicited by isolated words or phrases sufficiently demonstrates that these differences exist over an entire language. Bilingualism researchers such as Pavlenko (2012) would offer a rebuttal, observing that "the language we process on an everyday basis is not simply a string of more or less emotional words, registered one by one....[that, instead] the focus in everyday interaction is on detection of intentionality and relevance, precisely the aspects that are missing in the lab" (423). While these experiments focused exclusively on words that are known to heighten affect, such as taboo words and reprimands, such stimuli constitute a small subset of the total words in any language. Though Hsu, Jacobs, and Conrad (2015) demonstrate that bilinguals seem to feel more intensely at passages that are intentionally emotional, we do not know how (indeed, if) the magnitude of this effect changes when emotional words are in more innocuous text segments. Nor, importantly, do we have a clear understanding of how behavior may or may not change as a function of the effect.

Moreover, the same words can acquire very different meaning and emotional resonance depending on the context in which they are communicated. A taboo word, when used affectionately, no longer carries negative emotional valences. In the same way, "foot", one of Anoshian and Hertel's neutral words, will evoke very strong emotions in a podophilic than would be otherwise expected. Along those lines, Ayçiçeği and Caldwell (2004) reported that some of their participants laughed when they listened to childhood reprimands in L2, reporting on the "unusualness" of hearing these expressions as adults (984). While the experiment precisely translated the content across languages, it did not replicate the context in which the reprimands should be understood, which in turn would never evoke the same reaction (or lack thereof) in the subjects. The context of acquisition may also be an issue, as not everyone learns to associate similar emotions with the same words. Caldwell-Harris *et al.* (2010), the notable

exception in autonomic arousal experiments, found that the SCRs of Chinese-English bilinguals varied depending on Chinese proficiency when listening to endearments. Bilinguals who were equally proficient in English as well as Chinese⁴⁷ showed markedly higher SCRs in L2 English in direct contrast to previously studied groups of Spanish-English and Turkish-English bilinguals. While the exact cause is unclear, the authors suggest that Chinese-English bilinguals learn to associate greater emotional resonance in L2 because cultural conventions about emotional expression blocked their habitual expression in L1 (349).

While the L1 affective advantage seems to have been confirmed through a variety of direct measurement schemes, it is important to keep in mind that the confirmation comes from an interpretation of the physiological results. Researchers assume that autonomic readings from ERP or SCR at specified intervals are caused by affect, but that is only an interpretation and not fact. Caldwell-Harris *et al.* (2010), for example, noted that "novelty, surprise, familiarity, relevance to the self, and cognitive effort in retrieval and [making self-reported ratings] can all influence physiological arousal" (348). Neuroimaging studies have not been exempt, as the interpretation of neuro-activation patterns can be disputed. The specific functions of the areas of the brain are mostly assumptions, and one part of the brain may be implicated to multiple functions, making it difficult to discern whether its activation was due to one specific cause. Neuro-activation patterns also differ between genders (empathy: Rueckert and Naybar 2008; mathematical cognition: Keller and Menon 2009; Cognitive tasks: Bell *et al.* 2006; Emotional regulation: McRae *et al.* 2008), making it even more difficult to generalize. Moreover, fMRI software has come under considerable criticism in recent years for presenting invalid cluster

⁴⁷ Caldwell-Harris *et al.* also tested Chinese-English bilinguals with low Chinese proficiency and found that they exhibited higher SCRs in L1 Chinese. However, the authors attribute the difference to increased cognitive activity needed to process the terms rather than to the L1 being more emotional.

inferences, or false positives, as was found in a dead salmon (Bennett *et al.* 2009) or with control subjects at rest (Eklund, Nichols, and Knutson 2016).

Lastly, a quick perusal of the literature reveals that these experiments vary greatly with regard to the criteria by which they screen for experimental participants. The standard practice in the initial experiments was to recruit bilingual speakers based on their possessing the correct order and age of acquisition as well as sufficient proficiency in the target language set. Additional characteristics of the speakers' language acquisition background, such as language dominance and context of acquisition, were rarely investigated, thereby opening the door to confounding influences. This oversight extends to the discussion of results, which often conflated different types of bilinguals without understanding why acquisition differences may matter. While both of these practices have improved in recent years, most noticeably in the neuroimaging studies, attention to these details is still variable in other bilingualism experiments in psychology.

To recap, affect research has tentatively established that an L1 affective advantage probably exists when late bilinguals are exposed to isolated word or phrase stimuli in L1 and L2. While late bilingual subjects seem to recall L1 emotional stimuli better, no consistent difference in performance on other lexical tasks have been observed. What these experiments have not established is whether this intensity of feeling and any associated behavioral changes will hold when bilinguals are exposed to more than isolated words or phrases, such as language that may be used in real life. The next section examines recent psychology research that investigates the effect of bilingualism on decision-making. These decision research studies observe whether bilinguals exhibit different behaviors on standard psychology experiments when they are conducted in different languages. While the original experiment was formulated outside of the

bilingualism-affect paradigm outlined above, subsequent experiments have suggested that affect continues to play a prominent role in affecting how bilinguals view and solve problems.

Bilingualism in decision research

Decision research studies how people make judgments and decisions, such as how the framing or description of a situation affects a person's perceptions and choices. While the current paradigm in decision research acknowledges that "emotions are the dominant driver of most meaningful decisions in life" (Lerner *et al.* 2015, 801), the prevailing assumption until recently was that language was solely "a conduit to deliver information or as a tool to draw attention to specific features of a decision" (Hayakawa *et al.* 2016, 1). In other words, similar to political science, decision research discounted language as being capable of independently exerting influence when the content stays constant.

Mounting evidence suggests otherwise. Keysar, Hayakawa, and An (2012) were the first to propose a *foreign-language effect* in decision-making, which was defined as the difference in how a person will view and react to a situation depending on whether the situation is presented in L1 or L2⁴⁸. Their argument invoked Kahneman and Tversky's dual-process model, in which human cognition possesses a "fast" and a "slow" processing mode. The "fast" mode, also called affective processing, is "typically fast, automatic, effortless, associative, implicit (not available to introspection), and often emotionally charged"; by contrast, the "slow" mode, also called cognitive processing, is "slower, serial, effortful, more likely to be consciously monitored and deliberately controlled" (Kahneman 2003, 698). They asserted that the use of "[a] foreign

⁴⁸ Decision research consistently prefers the term "foreign language" over "second language." Geipel, Hadjichristidis, and Surian (2016) define a foreign language as "a nonnative language that has been learned in a classroom context rather than by immersion in a culture" (34). While most experiments in this field have adhered to this terminology, not all of the bilingual participants in these experiments fit this criterion.

language may provide greater [cognitive] distance because it is less grounded in the emotion system than a native language is...[which] might diminish the influence of affective processes and allow people to rely more on analytic processes when they make decisions" (662). In other words, speaking a second language will evoke the "slow" mode of cognition, allowing bilinguals to think more deliberately and carefully because they do not feel as deeply in that second language. The study administered several commonly administered psychology experiments, including the Asian Disease problem and two experiments on loss aversion, to different groups of foreign language learners⁴⁹. Bilingual participants were randomly assigned to either the control condition, in which all of the instructions are in L1, or the experimental condition, in which all of the instructions are in L2.

Clear behavioral differences appeared when the experimental results were sorted by language condition. In the Asian Disease problem⁵⁰ (Kahneman and Tversky 1979), used to

⁴⁹ The groups included English-French bilinguals in France, English-Spanish bilinguals in the US, English-Japanese bilinguals in the US, and Korean-English bilinguals in South Korea (Republic of Korea). Not all groups – participated in every experiment.

⁵⁰ The "Asian disease problem" was formulated by Tversky and Kahneman (1981) to illustrate how framing can violate the *invariance* of preferences, or the assumption that preferences are not affected by variations of irrelevant features of options or outcomes (Tversky and Kahneman 1986). The original scenario ran as follows:

Imagine that the United States is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed to combat the disease have been proposed. Assume that the exact scientific estimates of the consequences of the programs as follows:

If program A is adopted, 200 people will be saved.

If program B is adopted, there is a one-third probability that 600 people will be saved and a two-thirds probability that no people will be saved.

A majority of respondents prefer program A. However, when a second version of the outcomes was framed as follows:

If program A is adopted, 400 people will die.

If program B is adopted, there is a one-third probability that nobody will die and a two-thirds probability that 600 people will die.

The changed framing prompted a majority of the respondents to prefer program B even though the consequences are equivalent. Subsequent versions, such as the version posed in Keysar *et al.*, often made the citizens or the location

demonstrate the susceptibility of risk perception to changes in the framing of possible outcomes, L2 participants were equally likely to choose either treatments regardless of how the outcomes were presented. By contrast, L1 participants reacted similarly to participants from previously monolingual iterations of the same experiment, preferring different treatments when the framing for their outcomes changed. Two experiments investigating loss aversion, one using hypothetical betting with the Holt-Laury test⁵¹ (2002) and the other involving bets with real money⁵², showed that L2 participants were less averse, being more willing to take more bets when the stakes were higher. In summary, L2 participants seemed to have acted in a more rational manner than their L1 counterparts.

These findings inspired further efforts to identify whether bilingualism influenced other aspects of decision-making, moving from the realm of risk perception (also Hadjichristidis, Geipel, and Savadori 2015) to the perception of causality (Gao *et al.* 2015), to how intentions and outcomes are weighed (Geipel, Hadjichristidis, and Surian 2016), to moral judgments (Chan *et al.* 2016, Cipoletti, McFarlane, and Weissglass 2016, Costa *et al.* 2014a, Costa *et al.* 2014b, Geipel, Hadjichristidis, and Surian 2015a, Geipel, Hadjichristidis, and Surian 2015b). In general, most of these studies have found that bilinguals behaved in a more economically rational manner in the L2 condition, such as being less susceptible to the "hot hands" fallacy, in which people are

anonymous or varied the number of people afflicted by the disease, but remain otherwise faithful to the original formulation.

⁵¹ The Holt-Laury experiment (2002) is used to study risk aversion in experimental settings. Participants are asked to select between pairs of lottery-choice outcomes, with both low and high monetary outcomes, such as:

Option A: 1/10 of \$2.0, 9/10 of \$1.60

Option B: 1/10 of \$3.85, 9/10 of \$0.10

In order to study the degree to which a particular participant may be tolerant to risk. Keysar *et al.* performed a modified version of this experiment, in which the participant was asked whether he would accept or reject a single bet, such as having a 50% chance of losing ₩119000 (about \$105) and a 50% chance of winning ₩170000 (about \$150).

⁵² The third experiment studied myopic loss aversion with the method modeled by Shiv *et al.* (2005), in which participants were given a small sum of money with which to place bets. The participant can decide to decline the bet and keep the money, or to bet the money in a game of chance (coin-flipping) and have a chance at winning even more money.

more willing to take future risks when they have had a recent winning streak, and being more willing to make the utilitarian choice to undertake morally distasteful action for the good of the many.

As Costa *et al.* (2014a) found, not all decisions are susceptible to the foreign language effect. As the first to follow up on Keysar *et al.*'s work, extending the foreign language effect into domains such as psychological accounting and ambiguity aversion, the authors found that the bilingual responses on the cognitive reflection test (CRT) (Frederick 2005) did not vary as a function of language condition. The authors suggested that the CRT⁵³, which was "designed to assess people's ability to suppress an incorrect intuitive answer triggered by System 1 to generate a correct logical answer elicited by System 2" (Costa *et al.* 2014a, 249), tapped into purely logical thinking and did not involve any emotionality⁵⁴. Thus, the L1 condition could not invoke emotions that would distort the perception of the participant.

While many decision-research scholars now acknowledge that language can matter, the mechanism by which it influences behavior is still not clearly established. Keysar *et al.*'s initial research proposed that using foreign language invoked slow, cognitive processing, but how the invocation mechanism works is not at all well understood. The initial paper proposed three mechanisms: first, that L2 provides cognitive distance as it is less grounded in emotion as compared to L1; second, that reduced fluency in L2 requires increased cognitive processing for comprehension; and third, that processing difficulties in L2, which may be connected with what

⁵³ The test consisted of three questions including: (1) A baseball-bat and a baseball-ball cost 1.10 Euros in total. The bat costs one Euro more than the ball. How much does the ball cost? (2) If it takes 5 machines 5 minutes to make 5 keyboards, how long would it take 100 machines to make 100 keyboards? (3) In a lake, there is an area with flowers, every day, the area doubles in size. If it takes 48 days for the area to cover the entire lake, how long would it take for the area to cover half of the lake?

⁵⁴ They did add the potential caveat that the difficulty of the problems on the CRT did not leave room for the choice of language to affect it. However, the authors discounted this as a potential explanation as other studies have shown that behavioral changes as a function of trivial adjustments in previously monolingual experimental administrations were possible (Alter *et al.* 2007)

some later authors have called foreign language anxiety (Costa *et al.* 2014a, Hadjichristidis, Geipel, and Savadori, 2015, Lazar, Stern, and Cohen 2014), activate cognitive processing as the speaker is not confident of any conclusions that he can reach with affective processing.⁵⁵ Later authors suggest that cognitive processing may also be induced by foreign language anxiety (Costa *et al.* 2014a, Hadjichristidis *et al.* 2015, Lazar *et al.* 2014) which is defined as the anxiety that a bilingual may feel when using an L2 in which he does not feel wholly confident. Affect is the most likely culprit, as the difference in decision-making patterns is most apparent when the experimental subject is asked to become personally involved in a stressful situation (Costa *et al.* 2014b).⁵⁶ Moreover, Geipel *et al.* (2016) found that participants placed more emphasis on the outcomes rather than the intentions when reading difference scenarios in L2. If reading in L2 had activated cognitive processing, which usually entails more careful and systemic consideration, then we should expect the participant to think more carefully about all aspects of the situation, including the underlying intentions.

At the moment, experiments in this field have focused primarily on identifying where domains in which language affects decision outcomes rather than devoting attention to designs aiming to flesh out the causal mechanism (where very close attention to precise levels of fluency and frequencies of use of L2 would seem one natural focus). Though the field has identified "[d]ecisions...as the conduit through which emotions guide everyday attempts at avoiding negative feelings (*e.g.*, guilt, fear, regret) and increasing positive feelings (*e.g.*, pride, happiness, love)" (Lerner *et al.* 2015, 801), no similar consensus exists with regard to decision-making with

⁵⁵ All three instances seem to involve situations that required heightened processing, either because of the lack of heuristics in L2 that the person can rely on, because understanding the task in L2 is difficult, or because L2 and/or the task evokes negative feelings (such as anxiety or fear) that need to be overcome (see Alter *et al.* 2007). Though Keysar *et al.* do not go into this point in any detail, it seems clear that these three mechanisms can overlap.

⁵⁶ However, Geipel *et al.* (2015b) reported that the likely culprit was instead lack of access to normative knowledge that is usually accessible in L1.

regard to bilingualism. Whether L1 actually evokes greater affect than L2 is largely assumed and untested. The sole exception is Lazar *et al.* (2014), which collected the physiological arousal data (electrocardiogram, galvanic skin response, and electroencephalogram) from Hebrew-English bilinguals as they completed the Robert's Apperception Test for Children, Second Edition (RATC-II)⁵⁷. While the researchers assert that L1 stories were more highly emotional than L2 stories and claim that they found one significant result in the electroencephalogram data which ran counter to their hypotheses, they provided no scores or textual excerpts for independent evaluation.

Decision research literature has demonstrated that the choice of language can affect behavior when natural language stimuli are used. This is a significant advance from the affect literature in two main aspects: first, in demonstrating that behavior is susceptible to words not specifically designed as emotional in L1 when they are combined to evoke specific feelings, not just isolated emotion words that are in the minority in any language; second, in presenting language and scenarios that are more similar to real-world situations, improving the chances that inferences are externally valid. However, as discussed above, whether behavioral differences are actually the result of affect embodiment in L1 is an open question and does not seem to be pursued by the field at present.

⁵⁷ According to Lazar *et al.* (2014), Robert's Apperception Test for Children, Second Edition (RATC-II in the paper), "is used to clinically evaluate children between 6 – 18 years of age. It aims to provide a comprehensive and detailed understanding of the child's social perception....using 7 different scales that comprise the RATC-II: problem identification, outcome, available resources, emotion, resolution and unusual responses, and a theme overall overview" (4). When taking the RATC-II, the subject is asked to create a narrative in response to 16 picture cards, each comprising of a drawing of a different situation. Lazar *et al.* asked their participants to respond to two cards and then scored the stories on four dimensions including available resources, problem identification, resolution, and emotion.

General background on the experiments

This chapter presents three studies that explore how decision-making in bilinguals may be affected by the working language environment. The first two experiments replicate research by Keysar *et al.* (2012). The original experiment assessed whether participants made different decisions that could be attributed to a change in the working language. The first two experiments repeat the original framing risk and loss aversion experiments on a new bilingual speaker group, Mandarin Chinese (MSM⁵⁸)-English bilinguals, to assess whether these speakers were similarly influenced by changes in the working language. The third experiment is an original design; it attempts to assess whether participants in an Ultimatum Game scenario will behave differently when playing under different working languages. More specifically, the experiment examines whether players behave more "fairly", such as to propose more equitable divisions of money when playing as the offer0maker or be more likely to reject inequitable offers when playing as the responder (with a hypothetical counterpart) when playing in their second language as opposed to their first language. All three experiments were components of a larger survey experiment that was administered at a municipal-level university⁵⁹ in Beijing, China, in 2013.⁶⁰

All 477 participants were university students. For participants who provided demographic information, their ages ranged from 17 to 28 years of age, with an average age of 20.2 years (std. dev. 1.51 years). Aside from 19 participants who were pursuing graduate degrees, the students

⁵⁸ Mandarin Chinese is the common name for a group of Chinese languages spoken in northern and southwestern China. The standardized version for the PRC is called *Putonghua*, the common language, also known in English as "Standard Chinese" or "Standard Mandarin." In this dissertation, I have adopted Sinologist Victor Mair's convention in abbreviating this variety of Chinese (1991), which I used on my survey experiment and to communicate with local personnel, as MSM, short for Modern Standard Mandarin.

⁵⁹ Universities in the People's Republic of China are largely government-run. They can be administered by the Ministry of Education (a national agency), a provincial government, a municipal government, or some combination of the three. This survey was conducted at a university that is under the authority of the Beijing Municipal Government.

⁶⁰ A complete report on survey participants can be found in Appendix A.

were undergraduates. There were 101 male and 358 female participants.⁶¹ All of the participants spoke Mandarin as a first language and English as a second. They are late bilinguals⁶² who have been taught in a primarily classroom context by non-native English instructors. They are dominant bilinguals who use English in very limited contexts, mostly as passive consumers when reading articles for class or when consuming English-language entertainment. On a 10-point scale, the average self-rating for participants completing the MSM (control) version of the survey was 8.42 (std. dev. = 1.38, N = 224), and average self-rating for participants completing the English-language (experimental) version was 6.80 (std. dev. = 2.17, N = 240).⁶³

The materials for this chapter were originally written in English.⁶⁴ I translated the material into Chinese and localized it in consultation with native Mandarin speakers, some of whom were specialists in survey research in Beijing. To ensure comparability between versions, I translated the Chinese version back into English (Brislin 1970).⁶⁵ I also conducted a pilot study in order to collect information on draft versions of the survey, such as feedback on the quality of the translation, logistical information on the time needed to take the survey, etc. When the experiment was administered, participants were randomly assigned⁶⁶ to the control group, L1 MSM, or the experimental group, L2 English, and received paper survey that was entirely in

⁶¹ A total of 475 surveys were administered to students in STEM, social science, and humanities departments. The gender imbalance may be due to a general imbalance in the school, or the survey may have been administered to departments that are more likely to have more female students enrolled.

⁶² Some ambiguity exists as to whether the participants should be more accurately classified as childhood or as late bilinguals. While classroom instruction in English typically begins in elementary school, with parents often enrolling their children in additional instruction, intensive English instruction does not pick up until middle or high school, where English is a required examination subject for college entrance exams, known as the gaokao (高考).

⁶³ After assessing the examination materials, I determined that level six examination materials demand a reading comprehension level similar to that of the SAT.

⁶⁴ More information about survey development and administration can be found in Appendix A.

⁶⁵ The survey exists in two MSM versions and two English versions, as unforeseen circumstances forced me to revise the wording on several existing questions and to delete several more. The experimental modules used in this chapter were unaffected by the changes, and I assume that the content changes did not affect respondent answers.

⁶⁶ Surveys were divided by language condition and then by the version of Question 1 that was printed (Gain frame or Loss frame), for a total of four versions. Each version was assigned a number from 1 to 4, and then I used www.random.org to generate random numbers in that range, which we then used to randomly shuffle the different versions.

their assigned language. The survey alternated between modules on decision-making, political behavior, and political attitudes, and at the end, participants were also asked to provide demographic information.⁶⁷

Experiment 1: Framing risk

Tversky and Kahneman (1981) theorized that preferences can be swayed by the framing of potential outcomes, observing that while people tend to be risk averse when outcomes are quoted in gains, they are more likely to be risk seeking when outcomes are framed as losses. They formulated the Asian Disease problem⁶⁸ to illustrate that framing will influence decision-making in the aggregate despite the framing having made no changes to essential facts about the scenario or the outcomes. This divergence violated the invariance of preferences, or the assumption that preferences are not affected by differences occurring in irrelevant features of options or outcomes (Tversky and Kahneman 1986).

Keysar *et al.* (2012) suggested that the judgment and decision-making of a bilingual can be affected by language, specifically, whether the individual is making a decision in a foreign language as opposed to his native language. Relying on Tversky and Kahneman's work on dual-track cognition (for summary, see Kahneman 2003), which held that thinking and reasoning operates on both a "fast" affective track as well as a "slow" cognitive track, they proposed that slow cognitive processing of a foreign language reduces implicit biases, including loss aversion. They and Costa *et al.* suggest two reasons by which speaking a foreign language may invoke cognitive processing. First, a "foreign language may provide greater distance because it is less

⁶⁷ Despite a guarantee of anonymity and the survey requesting respondents to provide complete information, 16 surveys lacked all demographic information. Limiting demographic information to age, gender, year of schooling, and self-evaluated language ability, yielded 451 completed surveys.

⁶⁸ See footnote 34.

grounded in the emotional system than a native tongue...which] might diminish the influence of the affective processes and allow people to rely on analytic processes" (661). Loss aversion gives greater consideration to the emotional impact of loss, and using a foreign language may mitigate that impact by reducing the intensity of the negative emotion that is felt. Second, Keysar *et al.* suggest that reduced fluency in foreign languages lead to their being "typically processed less automatically than a native tongue (661). Because a less familiar language requires greater mental effort, such as increased attention or concentration, in order to understand it, slow cognitive processing will take precedence over fast affective processing in decision-making, "thus making people more cautious of their responses" (Costa *et al.*, 237).⁶⁹

Their experiment on framing risk asked English-Japanese, Korean-English, English-French, and English-Spanish bilinguals to respond to a version of the Asian Disease problem. In their version, half of the participants in each speaker group were randomly assigned to the L1 condition and half to the L2 condition. Following the original experimental design within each language group, participants were again randomly assigned to either a gain frame or a loss frame, with modifications given as follows:

1. **Gain frame:** Recently, a dangerous new disease has been going around. Without medicine, 600,000 people will die from it. In order to save these people, two types of medicine are being made.

If you choose Medicine A, 200,000 people will be saved.

If you choose Medicine B, there is a 33.3% chance that 600,000 people will be saved and a 66.6% chance that no one will be saved.

Which medicine do you choose?

⁶⁹ Costa *et al.* also suggested a mitigating factor, that of cognitive load, which may work *against* the benefits of slow cognitive processing. Because a second language is likely to be more mentally demanding, much more than a first language would be, bilinguals may instead be more affected by intuitive biases as "the rational processor cannot check or control the intuitive answers given by [affective processing]" (239).

2. **Loss frame:** Recently, a dangerous new disease has been going around. Without medicine, 600,000 people will die from it. In order to save these people, two types of medicine are being made.

If you choose Medicine A, 400,000 will die.

If you choose Medicine B, there is a 33.3% chance that no one will die and a 66.6% chance that 600,000 people will die.

Which medicine do you choose?

All of Keysar *et al.*'s L1 participants displayed preference patterns similar to Kahneman and Tversky's participants in greatly preferring the "safe" option (Medicine A) in a gain frame but slightly preferring a riskier option (Medicine) B in a loss frame. By contrast, the invariance of preferences seemed to have held in the L2 condition. Native speakers of English answering in Japanese and native speakers of Korean answering in English were about equally split between Medicine A and Medicine B regardless of frame (663-4). English speakers answering in French, by contrast, strongly preferred Medicine A regardless of frame. In all cases, then, notwithstanding this final instance of variation, there was a significant gain/loss frame effect in evidence for the L1 subjects, but not for the L2 subjects.

A replication by Costa *et al.* (2014a) with two very different speaker populations, Spanish-English and Arabic-Hebrew bilinguals, yielded conflicting results. While L1 participants responded similar to Tversky and Kahneman's and Keysar *et al.*'s participants, only Spanish-English bilinguals in the L2 condition were unaffected by frame, with half preferring Medicine A and half preferring Medicine B. Arabic-Hebrew bilinguals did not follow the expected pattern, instead preferring Medicine A regardless of frame in the L2 condition (Table 1,

241).⁷⁰ In general, Costa *et al.* observed that any differences were minor but also suggested that the results may have been due in part to a small sample size (241).

Replication

A total of 475 participants responded to the Asian Disease problem. In the L1/MSM group, 115 out of 229 participants were randomly assigned to the gain frame (N = 115), and 114 were assigned to the loss frame. In the L2/English group, 124 out of 246 participants were assigned to the gain frame and 122 were assigned to the loss frame. Precise frequencies and percentages are presented in Table 2.1a and 2.1b.

Visual inspection of the response distributions (Figure 2.1a and 2.1b) suggests that, similar to Keysar *et al.*'s and Costa *et al.*'s findings, the distribution of responses in the L1 MSM condition violated the invariance of preferences, with more responses preferring Medicine A in the gain frame and more responses preferring Medicine B in the loss frame. Slightly less than 54% of the participants preferred Medicine A in the gain condition, while slightly less than 44% of the participants preferred Medicine A in the loss condition. The difference between response distributions between the two frames was not significant, with $\chi^2(1, 229) = 1.93, p = 0.165$, signaling that framing likely did not affect how respondents answered when the experiment was conducted in MSM.

Distributional changes in the L2 English group were even smaller, and the response distribution of preferences behaved against expectations. Less than half, or approximately 48% of the English participants preferred Medicine A in the gain frame, while a small majority, or 53%, preferred Medicine A in the loss frame. Again, the difference between response

⁷⁰ A total of 129 Arabic-Hebrew students took part in the study, with N = 69 in the L1 Arabic condition (gain N = 34, loss N = 35), and N = 60 in the L2 Hebrew condition (gain N = 30, loss N = 30) (240).

distributions in the two frames was not significant, with $\chi^2(1, 246) = 0.409$, $p = 0.522$, again signaling that framing likely did not affect the distribution of responses when the experiment was conducted in English.

My replication contradicts Keysar *et al.*'s original results in finding that language frame did not seem to affect preference patterns when respondents were choosing to mitigate risk. While the original experiment did not perform any further analysis with their results, I have disaggregated my data in order to test hypotheses on whether gender and English fluency may have affected how respondents answered, and the analyses and discussion can be found in Appendix C.

Experiment 2: Loss aversion

"People are loss averse in the sense that they anticipate that the negative impact of a potential loss would outweigh the positive impact of an identical potential gain" (Keysar *et al.*, 664). People who are loss averse are usually also risk averse, in that overweighting the negative impact of a potential loss leads them to prefer extremely conservative choices in the face of uncertainty, even if a positive payout is likely. In other words, people who are risk averse "play it safe".

Risk aversion seems to be driven by affect. Shiv *et al.* (2005) found that experimental participants who had lesions in brain regions related to emotion "made more advantageous decisions and ultimately earned more money from their investments than the normal participants" (435). Keysar *et al.* extrapolate from that finding to assert that second language usage, by reducing emotionality or invoking cognitive distancing through increased cognitive processing, may help bilinguals to be less risk averse. They use a modified version of the Holt-

Laury experiment (2002)⁷¹ in order to measure the willingness of participants to take bets with various loss-to-gain ratios. While the original experiment asks the respondent to choose between pairs of bets, Keysar *et al.* instead asks him if he would like to accept or reject a bet with a certain win/loss ratio, with a sample scenario given as follows⁷²:

If you take this bet:

You have a 50% chance of winning \$20.

You have a 50% chance of losing \$10.

If you do not take this bet:

You will win \$0 and lose \$0.

Will you take this bet?

One hundred forty-six Korean-English bilinguals living in South Korea were randomly assigned to the L1 Korean (N = 68) or the L2 English condition (N = 78). They were asked to evaluate randomized bets that involved both high stakes (₩110,000 to ₩190,000, or about \$98.83 to \$170.71⁷³) as well as low stakes (₩2,000 to ₩10,000, or \$1.80 to \$8.98). The difference in stakes was necessary as previous studies suggest that the amount of money at stake affects the likelihood of loss averse behavior, with larger amounts of money more likely to evoke loss aversion than smaller amounts (Harinck *et al.* 2007).

Keysar *et al.* reported that their participants were overall more likely to take more bets and were less loss averse in the L2 experimental condition, on average taking 67% of English bets as compared to 57% of Korean bets in the L1 control condition (665). Language affected willingness to take larger bets only when the bet amount was high. While Keysar *et al.* could not

⁷¹ See Footnote 35 for sample wording

⁷² Wording is from the original experimental text, which was sent to me by the researchers (Personal email communications from Sayuri Hayakawa, April 11, 2013).

⁷³ The exchange rate of \$1 = ₩1113 is taken from the reported market rate in May and June 2013. As of November 27, 2017, \$1 = ₩1186.54.

adjudicate between whether the reduced-affect or the increased cognitive processing were the primary drivers of the changed behavior, they interpreted the results to support their hypothesis that second language usage reduced loss averse decision-making.⁷⁴

Replication

A total of 460 participants completed both the low stakes and the high stakes portions of the experiment⁷⁵. The L1 MSM condition had 221 participants while the L2 English condition had 239 participants. All participants were asked to respond to low stake bets, with potential win amounts varying between ¥11 and ¥40 (\$1.79 and \$6.51⁷⁶), as well as high stake bets, with potential win amounts varying between ¥1130 and ¥3600 (\$184.04 and \$586.32). The monetary amounts were converted from the amounts stipulated by the original research design and then adjusted in consultation with local colleagues to produce plausible high and low stakes to suit local price levels.⁷⁷ The amounts in the low stakes portion was targeted to be enough money to buy a lunch from the school cafeteria, while amounts in the high stakes portion was set to be at least half of an average student's monthly expenses. Following Keysar *et al.*, each question followed the sample format, provided below:

⁷⁴ Costa *et al.* did not reproduce Keysar *et al.*'s experiment, instead opting to conduct Holt-Laury's original experiment with Spanish-English bilinguals, which asked participants to make a choice in each of 10 pairs of bets. Each pair offers two bets with very different win/loss ratios. Bet A starts off by offering a relatively low win ratio for a large sum, while Bet B offers a relatively high win ratio for a small sum of money. With each pair of bet offered, the win ratio for the two bets change until Bet A ends by offering a relatively high win ratio for a large sum and Bet B offers a relatively low win ratio for a small sum of money. The objective is to track when participants switch from preferring Bet B to preferring Bet A. Risk-averse people are more likely to switch later rather than earlier, while the expected threshold for risk neutral individuals is at the 50/50 line. They report that participants in the L2 English condition were more "consistent" and were less risk averse, "hence promoting the selection of the more objective highest expected value option", than participants in the L1 Spanish condition (246).

⁷⁵ As only surveys that contained a complete set of responses were used, nine sets of responses were not analyzed due to failure to respond to one or more of the bets.

⁷⁶ The exchange rate of \$1 = ¥6.14 is taken from the reported market rate in May and June 2013, the exchange rate was. As of February 14, 2017, the current rate is \$1 ≈ ¥6.60 RMB.

⁷⁷ The KRW to RMB amounts were roughly equal to each other when the experiment was designed and administered in May and June 2013, when \$1 = ¥6.14 RMB and \$1 = ₩1113.

You have a 50% chance of winning ¥8, you will have a 50% chance of losing ¥14.50.
Do you accept this bet? Yes No

In order to avoid question-order effects (Schuman and Presser 1981), bets in each module were randomized to reduce the likelihood that participants might set a threshold at which they automatically accepted every offer. Distractor modules that collected information about participant attitudes and behaviors separated the low stakes module from the high stakes module.

This experiment was not a simple replication in two ways. First, because the experiment was given on paper instead of via computer, space limitations prevented all ten bets in the low stakes condition and ten in the high stakes condition being raised. Instead, each stake module consisted of six bets at various loss/gain ratios. Second, this experiment used slightly adjusted monetary amounts of the bets so that the resultant expectant values would be monotonically increasing.⁷⁸ In my replication, I selected values such that expected value fell monotonically with loss-gain ratio, to ensure that attractiveness of both kinds was aligned. The prediction, net of language effects, is thus unambiguously of higher acceptance rates for lower ratios (higher expected values). Tables 2.2a and 2.2b display the expected values of the bets for this experiment.

⁷⁸ Keysar *et al.* selected equal-odds gain and loss values that always produced positive expected values and then equated both expected value and loss-to-gain ratio with attractiveness. The loss-gain ratio is more accurately a measure of unattractiveness, from "highly attractive" 1/10 to "unattractive" 9/10. Their Figure 3 labeled the ratio "attractiveness" but also reversed the x-axis so that 0 was, appropriately for the label, on the right, not left (665). They wrote, "This attractiveness variation was important to demonstrate that participants were sensitive to expected value and that they were indeed more likely to take bets that had higher expected value" (665). Crucially, however, their chosen values had the unfortunate feature that expected value fell monotonically with the loss-gain ratio only for the high stakes cases. The low-stakes values, by contrast, had the highest expected value at the median loss-gain ratio of 5/10, falling off in both directions. Introducing such discrepancy in expected attractiveness/acceptance rate across the stakes frame is plainly undesirable, notwithstanding the fact that expectations are merely ordinal, with no real theory of the likely form of association (*e.g.* linear or not in ratio or expected value).

Overall, in the low-stakes condition, English-language respondents took slightly more bets (60.5%) than did the MSM-language respondents (59.4%). The difference between the overall number of bets taken was not statistically significant, with $\chi^2(1, 460) = 0.265, p = .607$.⁷⁹

Though the rate of bet acceptances looked similar over all for the two groups, the loss/gain ratio points at which each group took those bets were very different. Figure 2.2a shows notable differences between the bet-acceptance rate distributions in the L2 English condition and the bet-acceptance distribution in the L1 MSM condition. Both distributions are largely convex, though the MSM-language distribution is monotonically decreasing while the English-language distribution is not.

Both sets of respondents exhibited the expected preference for bets with higher expected values. English-language respondents had a slightly lower acceptance rate than MSM-language respondents at lower loss/gain ratios (0.125, 0.25). However, the groups abruptly change places in the middle, and English-language respondents changes to consistently having a *higher* acceptance rate than MSM-language respondents for the higher loss/gain ratios, or bets with higher expected values. The biggest disparity is at the loss/gain ratio of 0.55, where 68.7% of English-language respondents accepted the bet, but only 63.9% of MSM-language respondents did. However, the distributions are relatively similar to each other, with 2-sample Kolmogorov-Smirnov test yielding $D = 0.024, p = 1$ ⁸⁰, which could not reject the null hypothesis that the total number of bets taken by a respondent in each language condition came from the same distribution.

⁷⁹ The N reported here is the number of bets (6) multiplied by the number of respondents (460). The original analysis reached the same conclusion with an F-test, comparing the distributions of the *total* number of bets taken in each language. However, the F-test requires that the two samples be normally distributed, which the Shapiro-Wilk normality test rejected for both of the distributions in my data.

⁸⁰ An exact p-value could not be computed due to ties.

In the high-stakes condition, English-language respondents again took more bets (39.4%) than did MSM-language respondents (37.1%). Again, the difference between the overall number of bets taken was statistically insignificant, with $\chi^2(1, 460) = 1.442, p = .230$.

The shape of the bet-acceptance distribution for high-stakes in Figure 2.2b is convex rather than concave as was seen in Figure 2.2a for the low-stakes distribution. The average acceptance rate of the MSM-language respondents is still smaller than the average acceptance rate of the English-language respondents, though the gap has now grown to 1.3% from 0.6%.

Once again, the loss/gain ratios at which the two groups accepted bets were different. MSM-language respondents accepted more bets than did English-language respondents at bets with the smallest expected value, with 70.6% and 69.0% respectively accepting the bet at a loss/gain ratio of 0.125, and at a loss/gain ratio (0.75, where English group = 25.1% acceptance, MSM group = 25.9% acceptance).⁸¹ Otherwise, L2 English participants accepted more bets as the loss/gain ratio increased, ranging from 2% more acceptances at loss/gain ratio 0.25 to 3.4% at loss/gain ratio 0.91. However, the difference in distributions is again very slight, with a 2-sample Kolmogorov-Smirnov test yielding $D = 0.059, p = 1$ ⁸², which could not reject the null hypothesis that the acceptance rates for both experimental conditions come from the same distribution.

The findings in this experiment contradict Keysar *et al.*, finding that the working language does not affect participant decision-making with respect to mitigating loss aversion.

While the bet-taking behaviors of the language groups looked similar overall, an examination of

⁸¹ MSM-language and English-language respondent acceptances were also relatively similar in the low-stakes condition at this loss/gain ratio, which makes me suspect that the monetary amount that was offered may have been suspect. In the low-stakes condition, respondents were offered a 50% chance to lose ¥8 for a 50% chance to win ¥14.5. In the high-stakes condition, respondents were offered a 50% chance to lose ¥800 for a 50% chance to win ¥1140.

⁸² Again, an exact p-value could not be computed due to ties.

where each group took those bets did find that English-language recipients were slightly more likely to take more risky bets.

Experiment 3: Bilingualism and the Ultimatum Game

Alford and Hibbing (2004) observed that "[civil] societies of [sufficient size to preclude universal involvement in the decision of making key decisions] will inevitably have innumerable diverse demands placed upon the scarce available resources, thus rendering it virtually impossible for any given person or group to receive an outcome they regard as favorable" (62). Studying how a person behaves when asked to share a limited amount of resources, such as how he may react when confronted with what he perceives to be an unfair division of resources, *e.g.* one that he perceives to unjustly favor the other parties to his own expense, may provide important insights to understanding that person's voting behavior or his opinions toward government institutions.

The Ultimatum Game (UG) encapsulates a very simple form of economic decision-making, wherein a benefit of some kind is divided in two stages. It has been used to study the divergence of empirical human behavior from pure "rational" behavior, in which decision-makers conditionally maximize their own utilities. In the traditional game, two players are given an amount of money that must be split and shared. The first player, the "proposer" or "offerer", makes an offer on how to split the money, while the second player, the responder, accepts or rejects his offer. The two players receive the proposed amounts of money only if the responder agrees to the proposal; neither player gets any money if he rejects it. Researchers have developed variants of the UG to focus on specific aspects of gameplay, such as how the absence of information affects the likelihood of the responder rejecting an offer or how rejection rates may

vary with the amount of money being split (for summary, see Camerer 2003, Chapter 2). This chapter introduces a new variation, investigating whether bilinguals make different decisions when the working language of the game is changed, such as making different offers or changing their likelihood of rejecting a low offer when playing in one language versus another.

While rational choice expects that the proposer will always maximize his own gain, such as offering the smallest possible amount of money⁸³ or accepting any nonzero offer, behavioral game theory extends that expectation with the insight that people will take into account other factors such as "emotion, mistakes, limited foresight, doubts about how smart others are, and learning" when making decisions (Camerer 2003, 3). Empirical instances of the Ultimatum Game have consistently demonstrated that many or most people offer more than the bare minimum and reject offers that they consider to be unfair.⁸⁴ Camerer's overview (2003) of UG studies found that for proposers, "[m]odal and media ultimatum offers are usually 40-50 percent and means are 30-40 percent", while "[o]ffers of 40-50 are rarely rejected [while o]ffers below 20 percent or so are rejected about half the time" (49).⁸⁵

Many factors influence decision-making regardless of the players' awareness of them. Characteristics such as age affect game play, with younger children acting primarily on self-interest when playing the UG (Harbaugh, Krause, and Liday 2003). However, that pronounced self-interest is temporary. As they grow, children are socialized in the expectations and practices

⁸³ There is a nuanced point to be made about Nash equilibria. When money is infinitely granular, the only equilibrium sees the proposer offer nothing and the receiver accept any offer, including 0; when money is discrete, an additional pure-strategy equilibrium has the proposer make the smallest possible offer (1 unit) and the receiver accept any offer greater than the reservation value (obtained by rejection) of 0. There are also more complicated equilibria involving probabilistic mixes of behavior.

⁸⁴ The egalitarian ideal is a proposal that splits the total pot equally between players. I define a "fair" offer as one in which the proposer thinks that he has proposed to give a sufficient amount of the pot to the responder *and* one in which the responder accepts, because he thinks that he has received a sufficient amount of the total pot from the offerer. Since the offerer and the responder may have different ideas of what constitutes a "sufficient" amount of money, their ideas of what fairness entails may also differ, and this broader definition is not limited to a precise 50-50 split.

⁸⁵ Heine *et al.* labeled societies where these almost all of these experiments have been conducted as being "WEIRD", *i.e.* Western, Educated, Industrialized, Rich, and Democratic.

of their communities, such as standards of fairness, though the natural variation seen in the self-interest of children never go away completely (Harbaugh, Krause, and Vesterlund 2001). Race seems to affect performance, with black student players offering more money but also making more rejections (Eckel and Grossman 2001). Gender also seems to matter, as both genders expect greater generosity from women than from men (Solnick 2001). When playing face to face, players are much more generous when their partners are attractive, both offering more money and also accepting lower offers (Schweitzer and Solnick 1999). Education seems to predict greater self-interested behavior, at least among economics students⁸⁶, but this is likely a function of self-selection as well as potentially the knowledge of what constitutes expected behavior in the UG.

Larger forces such as culture influence decision-making at the group level. Heinrich, Heine, and Norenzayan (2010) found that players from societies such as "foragers, horticulturalists, pastoralists, and subsistence farmers, drawn from Africa, Amazonia, Oceania, Siberia, and New Guinea" differed greatly from players from developed countries (5), both in how much proposers will offer and the threshold at which responders begin to rejecting offers *en masse*. To explain the disparity in their findings, Heinrich *et al.* suggest that culture-transmitted expectations about fairness have been shaped by local conditions⁸⁷, and that these expectations form a collectively generated baseline that an individual accesses when judging whether a situation is fair.⁸⁸ The difference is not limited to between developed countries and small-scale

⁸⁶ The stereotype of the self-interested economics student is widespread. Marwell and Ames (1981) tested whether different groups of student participants behaved differently when confronted with a large-group collective dilemma such as one described by Mancur Olson (1965). They found that the only subjects who acted in accordance with rational expectations were economics graduate students.

⁸⁷ Candidate factors include community size, which predicts greater punishment, the development of durable institutions governing transactions coevolved with larger societies, *etc.* (Heinrich, Heine, and Norenzayan 2010, 5).

⁸⁸ On the basis of the Ultimatum Game and other perception-based assessment tasks, Heinrich *et al.* went on to assert that the WEIRD (Western, Educated, Industrialized, Rich, and Democratic) societies, are actually the least representative populations that scholars can use to generalize about human perception (1).

societies, as players within the developing and developed spheres also exhibit notable differences in behavior. Roth *et al.* (1991), for example, found that proposers in Japan and Israel made lower offers than proposers in the United States and Slovenia, though responders rejected low offers at similar rates in all countries. They concluded that "what varies between subject pools is not a property like aggressiveness or toughness, but rather the perception of what constitutes a reasonable offer under the circumstances" (1092).⁸⁹ In other words, while socialization is a universal experience, the contents of that socialization may differ from place to place as they are generated locally. Whether culture represents a legitimate force is an ongoing question, as a meta-analysis by Osterbeek, Sloof, and van de Kuilen (2004) of 75 UG experiments around the world found that most of the observed behavioral differences could not be attributed to cultural traits as formalized by either Hofstede's (1991) or Inglehart's (2000) classification systems.⁹⁰ However, Clist and Verschoor (2017) reported that bilingual respondents in Uganda contributed 30% more in the public goods game when the working language was Luganda, the national language, as opposed to Lugisu, belonging to the local culture that values self-reliance but not reciprocity or cooperation.

Simply knowing the local expectations for a fair division of money is not enough to ensure compliance to those standards, and studies suggest that affect is the driving force for both offerers and responders. Straub and Murnighan (1995) proposes an anger/spite model⁹¹ in which "the sequence for rejecting an offer is perceiving that the offer is unfair, feeling wounded pride

⁸⁹ In contrast, Buchan, Johnson, and Croson (1997) found that Japanese proposers offered more money. The earlier study asked players to state a minimum acceptable offer (MAO), while Buchan *et al.* studied the specific offers made by the proposers. This discrepancy suggests that participant behavior may be further influenced by the social dynamics resulting from the experimental design (Camerer 2003, 70), but there seems to be no research comparing the various game setups.

⁹⁰ The only behavioral difference that seemed to correspond with culture was the amount that an offerer proposes to give to the responder. A higher score on Inglehart's scale of respect for authority, which suggested more respect for authority, was associated with lower monetary offers (184).

⁹¹ The "anger/spite model" label was formulated later by Pillutla and Murnighan (1996).

and anger toward the offerer, and rejection of the offer in spite" (209). Their correlational analysis relied on *post hoc*, self-reported data, but as Caldwell *et al.* (2011) have demonstrated, self-reported affect does not necessarily match up with what is truly happening on the physiological or the cognitive level. Camerer (2003) proposes an alternate affect model that seeks to explain both offerer and responder behavior. In it, offerers who propose more equitable splits could be fair-minded (*i.e.* disinclined to create very unequal splits), could be motivated by fear of being rejected and thereby receiving nothing, or both. In turn, responders reject low offers due to either indignation or indignation, with the difference being whether they perceive the offer as being socially unacceptable (the former) or being personally offended at the offer (the latter) (Camerer, 49).

While neuroscience has not established one-to-one correspondence between an emotion and specific areas of the brain, scientists working in neuroeconomics, an interdisciplinary field that investigates the neurological underpinnings which motivate suboptimal or illogical decision-making, been able to demonstrate that research subjects who play the Ultimatum Game demonstrate higher activation in areas of the brain generally linked to affect. Sanfey *et al.* (2003) used fMRI data and found that players responded to unfair offers by displaying strong activation in the dorsolateral prefrontal cortex (DLPFC), the anterior cingular cortex (ACC), and the anterior insula. The DLPFC is primarily linked to cognitive processes such as goal maintenance and executive control, which has been linked to overriding the impulse to reject unfair offers (Baumgartner *et al.* 2011, Knoch *et al.* 2006). The ACC "has been implicated in detection of cognitive conflict, and activation here may reflect the conflict between cognitive and emotional motivations in the Ultimatum Game" (1757), and is thought to detect social norm violations in conjunction with the anterior insula (Güroğlu *et al.* 2011). Most importantly, the anterior insula

has been linked to negative emotional states, and the Sanfey *et al.* reported that participants who displayed strong activation in the anterior insula rejected a higher proportion of those offers (1757).

That affect seemed to guide the rejection of unfair offers was bolstered by findings from both SCR and other fMRI studies. van't Wout *et al.* (2006) reported that SCR levels were higher for unfair offers than or more fair offers, and that participants who displayed higher SCR levels were more likely to reject those offers. However, they added that the disparity seemed to disappear when the unfair offer was generated by a computer instead of a human, with SCR levels remaining much more stable when participants responded to a computer-generated offer. In addition, the participants were more likely to accept a computer-generated offer.⁹² Several ERP studies have also investigated player responses during the Ultimatum Game, as Van der Veen and Sahibdin (2011) suggest that the cardiac response may be related to the emotional impact of the offer. The findings have been contradictory and difficult to interpret: Osumi and Ohira (2009) reported exaggerated cardiac slowing after unfair offers, especially ones that were rejected, while Van de Veen and Sahibdin (2011) reported less cardiac slowing in response to unfair offers as compared to fair offers.

Later fMRI studies also examined whether the ventromedial and ventrolateral prefrontal cortex (the VMPC and the VLPC, respectively), linked to the modulation of emotional reactions, affected player behavior in the UG. Koenigs and Tranel (2007) reported that damage to these areas⁹³ resulted in "poorly controlled emotional responses that are incommensurate with the

⁹² Though van't Wout *et al.* did not propose a reason for the disparity between how participants responded to human-generated and computer-generated proposals, their finding seem to support Kim *et al.* (2013)'s assertion that psychological distance decreases the responder's tendency to reject low offers. Kim *et al.* reported that offerers became increasingly rational and accepted more low offers when playing on behalf of the third party than for themselves.

⁹³ For studies involving VMPC damage, researchers recruited patients with documented damage in that area (Gurogilu *et al.* 2010, Koenigs and Tranel 2007, Tabinia, Satpute, and Lieberman 2008), while the only VLPC

precipitating event" (951), and multiple studies reported that players with VMPC or VLPC damage displayed a disproportionately higher rate of rejection of UG offers that fall below 30% of the total pot (Güroğlu *et al.* 2010, Knoch *et al.* 2006, Koenigs and Tranel 2007, Tabibnia, Satpute, and Lieberman 2008). Consciously developed proficiency in emotional self-regulation also seems to affect behavior. Kirk, Downar, and Montague (2011) compared practitioners of mindful meditation, who were better able to regulate their affective states for the cultivation of well-being and emotional balance (Lutz *et al.* 2008), and non-meditators, finding that the meditators displayed less activation in the anterior insula and were observed to act more rationally by accepting more than 85% of the "unfair" offers.

While the total body of research is still small, the tentative consensus thus far is that the rejection of unfair offers in the Ultimatum Game is driven by negative affect. Incorporating findings from affect research and decision research, I suggest that bilinguals playing the Ultimatum Game in L1 will behave like monolingual participants, while bilinguals playing the UG in L2 will be more likely to behave in a more self-serving manner, *i.e.* in a more economically rational mode, leading to the following hypotheses:

H₁: When playing as the offerer in their native language (L1), bilingual participants will be more likely to propose splitting the money more equitably, that is to say, offer amounts that approaches half of the total amount.

H₂: When playing as the responder in their native language (L1), bilinguals will be more likely to reject inequitable proposals, or those that are substantially less than half of the total amount.

The L1 affective advantage means that bilingual offerers playing in their native language will feel greater fear that may prevent them from making money-splitting proposals that disproportionately benefit themselves. Meanwhile, bilingual responders will feel greater anger

study by Knoch *et al.* (2006) used low-frequency repetitive transcranial magnetic stimulation (rTMS) to inhibit the functions of the target area.

and indignation when they think that proposals are unfair, and their feelings will prompt them to reject those proposals.

By contrast, greater affective distance in L2 leads to the bilingual being less likely to fear of rejection when acting as the offerer and less likely to become angry at unfair offers as the responder. In addition, the greater likelihood of using cognitive processing when using L2 also means that the bilingual is more likely to act more strategically, focusing on overall gains as opposed to focusing on short-term offenses. Both cases lead to the bilingual responder accepting more asymmetric offers in L2.

H₃: When playing as the responder in their second language (L2), bilinguals will be more likely to accept proposals, even ones that offer them more inequitable amounts that are less than half of the total amount.

Whether the bilingual offerer will be more fair—that is, act in a less economically rational manner—when dividing the money is an open question. Greater emotional distance may mitigate the fear that the other player will reject a proposed sum of money. Conversely, greater strategic planning, which is the result of greater reliance on cognitive processing, may act like fear in guiding offerers to split the money more equitably.

H₄: When playing as the offerer in their second language (L2), bilinguals will be more likely to splitting the money more equitably, that is to say, offer amounts that approach half of the total amount.

H₅: When playing as the offerer in their second language (L2), bilinguals will be more likely to splitting the money less equitably, that is to say, make proposals that disproportionately benefit themselves.

Experimental Design

A total of 347 participants responded in full in the offerer module, 178 in the L1 MSM condition and 169 in the L2 English condition.⁹⁴ The response rate was higher in the responder module, where 464 participants answered in full, with 224 in the L1 MSM condition and 240 in the L2 English condition.

Logistical constraints limited the Ultimatum Game to be played on paper as modules of the larger survey experiment that also hosted the previous two replication studies. Participants had the opportunity to play as both the offerer and the responder. They were asked to imagine that playing with another person over a sum of money. The instructions made it clear that no money would exchange hands. The instructions of the offerer module read as follows:

Imagine that you and another person are given an amount of money to split between the two of you. Your job is to split the money. The other person's job is to decide whether to accept your offer.

You can give this person none of the money, some of the money, or all of the money. If he or she decides to accept the offer, then you two split the money according to your proposal. If the other person rejects the offer, neither of you receive any money.

Participants were asked to indicate an amount that they would keep and then an amount that they would give to the other player when splitting a small sum of money (¥5, or \$0.81), a medium sum of money (¥60, or \$9.77), and a large sum of money (¥475, or \$77.34). They were not given instructions on whether to only offer integer amounts or decimal amounts. After completing

⁹⁴ While 407 participants actually answered the offerer module, responses from about 60 participants were discarded as they were improperly filled in, as confusion about the instructions led these respondents to answer with checkmarks instead of with monetary amounts. As I could not accurately determine respondent motives, I included an alternate coding for the data but did not include them in this analysis. I have included details about the respondent sample as well as an alternate analysis with this coding in Appendix C. In summary, if I interpreted the checkmarks as assigning the money to one of the players, in effect creating allocations in which the other player could receive none, half, or all of the money to the other player, the resulting analysis yields results that are relatively similar to the results presented in Table 2.3. A two-sample t-test conducted on the effect of language on mean amounts kept was not statistically significant.

modules on participant attitudes and behaviors, the responder module repeated the instructions⁹⁵ and asked the participant to decide whether to accept or reject a moderate amount of money, ¥20 (\$3.26), and then a larger amount of money, ¥100 (\$16.29), in each case, described as a 20% allocation being made by an offerer. The 20/80 split was chosen because Camerer (2003) reported it as the point at which responders transition from accepting an offer a majority of the time to rejecting offers more than half of the time.⁹⁶

Discussion

Table 2.3 displays the descriptive statistics for offers, both the amounts offered and the portion that is potentially kept, for each stakes-language combination. On average, the amount that is offered to the hypothetical second payer is fairly similar in both mean and standard deviation for the ¥5 (low-stakes) condition and the ¥60 (medium-stakes) condition. In the ¥475 (high-stakes) condition, however, both the mean and standard deviation differ noticeably, with the MSM-language respondents offering about ¥8 less on average than the English-language respondent. The standard deviation of the English-language respondents was also ¥5 tighter.

As Experiment 2 has shown, examining the response distribution can often reveal valuable information about how the respondents made decisions individually. In the low-stakes condition, shown in Figure 2.3a⁹⁷, about an equal number of respondents in either language groups offered the other person all of the money. However, the pattern is considerably more confused below that amount. Despite a slight spike of English-language respondents who were

⁹⁵ Unfortunately, there was a misprint in the survey, and the instruction words for the offerer module were reprinted for the responder module. However, the responder module included further instructions that clarified what the respondents were supposed to do, and all completed the module without problems.

⁹⁶ Space limitations prevented the inclusion of additional offers that could have varied the monetary amount as well as split ratios.

⁹⁷ Bin size was ¥0.5

willing to offer nothing to the other respondent, more MSM-language respondents than English-language respondents were likely to offer less than half of the amount to the other person. By contrast, more English-language recipients were likely to give slightly more than half (¥3).

In the medium-stakes condition, shown in Figure 2.3b⁹⁸, both groups of recipients were likely to offer the other party half of the ¥60. This may have been due to the amount being easily divisible. The pattern is more consistent this time, with more MSM-language recipients offering less than half of the money. Less than 4% of MSM-language recipients offered more than ¥30 as compared to about 6% of English-language recipients.

The relative frequency distribution of responses of the high-stakes condition, shown in Figure 2.3c⁹⁹, showed a much more confused pattern. A small minority of English-language respondents was willing to offer the opposite party all of the money, while a similar number of MSM-language respondents were willing to offer around ¥300, which is more than half of the total amount. Half of ¥475 is approximately ¥237.50, and about 33% of MSM-language respondents offered between ¥237 and ¥238. While only 30% of English-language respondents offered between those two RMB amounts, and about 10% offered ¥240 (as compared to 6.7% in the MSM-language condition), more English-language respondents seemed to have offered less money.

I conducted independent-sample t-tests (assuming unequal variance) on the offer amount distribution between the language groups to see if language affected how much the participants kept for themselves in all stakes conditions. I found that the differences were not statistically significant at any stake level (low stakes: $p = 0.830$; medium stakes: $p=0.155$; high stakes: $p =$

⁹⁸ Bin size was ¥5

⁹⁹ Bin size was ¥10. I chose to use a relatively small bin size here in order to show the division of offers before and after the equal –sized offer.

0.218).¹⁰⁰ In addition, because the independent-sample t-test assumes normal distribution, I also conducted Mann Whitney's U Test on the stake conditions in order to test for the similarity of distributions.¹⁰¹ This was also unable to reject the null hypothesis that the distributions of offers by language condition in all three stake conditions were different.

Finally, Table 2.4 provides the response frequency for the responder module. Overall, less than 40% of the responders accepted the 20/80 offer, though the acceptance rate for English-language recipients was higher than for MSM-language respondents in both stake conditions. In the low-stakes condition splitting ¥20, about 33.5% of MSM-language respondents accepted the offer, while 43.8% of English-language recipients did. The contrast was somewhat less stark in the medium-stakes condition splitting ¥100, in which 35% of MSM-language respondents accepted the offer while 39% of English language recipients did so.

The working language seemed to affect responses at the low stakes level but not at the medium stakes level. In the low stakes condition, the difference between acceptance levels was statistically significant at $\chi^2(1, 464) = 4.72, p < 0.05$; however, the difference between acceptance levels was not statistically significant in the medium stakes condition, with $\chi^2(1, 464) = 0.596, p = 0.442$.

In the offerer condition, if language did indeed affect the amount offered, then I would have observed a difference in the mean, standard deviation, and/or the distribution of responses. However, both language groups were almost equal in their willingness to split the money equally. I was unable to confirm any of the alternate hypotheses for the condition ($H_1, H_4, \text{ or } H_5$) on the mean amount offered. However, there is some anecdotal evidence suggesting that, at the

¹⁰⁰ This version of the results assumed unequal variances. I also reran the analysis assuming equal variances between samples and found similar results, with low stakes: $p = 0.829$; medium stakes: $p = 0.155$; high stakes: $p = 0.219$.

¹⁰¹ Low stakes: MSM median = 2.5, English median = 2.5, $U = 15532, p = 0.588$; medium stakes: MSM median = 30, English median = 30, $U = 15995, p = 0.190$; high stakes: MSM median = 237.5, English median = 237.5, $U = 16022, p = 0.290$.

medium- and high- stakes conditions, English-language recipients may be marginally more willing to offer more than half of the money (see H₄).

Conclusions about behavior in the responder condition are more mixed. If language affected willingness to accept an inequitable amount of money, then we would have expected that English-language respondents be more willing to accept bets. However, my analysis seems to confirm H₂ (bilinguals playing in L1 will be more likely to reject inequitable proposals) and, equivalently, H₃ (bilinguals playing in L2 will be less likely to reject inequitable proposals) only for the low-stakes condition.

Conclusion

To recap, Keysar *et al.* (2012), who found that the choice of language that a bilingual used will affect how that person responded to risk and to potential loss. The cause of this difference was likely the relative lack of affect found in L2. This has led researchers to conclude that "choices made when problems are presented in a [foreign language] are less subject to intuitive biases" (Costa *et al.* 2014a, 252), with Keysar *et al.* speculating that "people who routinely make decisions in a foreign language rather than their native tongue might be less biased in their savings, investment, and retirement decisions, as a result of reduced myopic loss aversion. Over a long time horizon, this might very well be beneficial." (667)

However, my replications largely did not reproduce the expected differences. Experiment 1, which replicated the Framing Risk experiment, found that though the choice of working language seemed to affect the preference of treatments, with MSM-language respondents being more sensitive to framing than the English-language respondents, that difference was not statistically significant. Experiment 2, which presented a variant of Holt-Laury's loss aversion

experiment found no difference in the overall number of bets taken between language groups, but again, some anecdotal evidence suggests that MSM-language and English-language respondents are more likely to say yes to bets at different loss/gain ratios.

Finally, I extend the affect argument to the Ultimatum Game, arguing that affect influences the decision to divide a pot of money and also the decision of whether to punish a party that offers a small and inequitable amount of money. The results are split here, with no statistically significant differences in the medium stakes condition but a statistically significant difference ($p < 0.05$) in the low-stakes condition, with MSM-language respondents rejecting more offers than did the English-language respondents. This suggests that while MSM-language respondents may be content with a relatively small offer in situations where the total pot of money and their share will be of sufficient size, they may be more sensitive to being cheated when the pot is small. In the face of scarcity, MSM-language respondents may become more sensitive to the monetary value of their share, especially when it falls below some preset threshold.

Why, then, did these experiments not replicate the findings of Keysar, Costa, and their associates as anticipated? The joy of conducting research in the comparative realm, especially under different pressures imposed by local conditions, also present countless possibilities for future research. For example, one potential explanation for the lack of difference in these MSM-English respondents may be that their reaction differences are cultural. Along the lines of Henrich *et al.*, cultural and social norms about loss and about fairness may shape participant perceptions very differently. However, the likelihood of this explanation is suspect, as the original Keysar *et al.* experiment found language to be an issue with both a Japanese-English bilingual respondent sample as well as a Korean (ROK)-English bilingual respondent sample.

Japan and South Korea are countries that are commonly cited to share a common history and, to this day, shared cultural values. One point of disparity that may merit further exploration is their respective attitudes toward money. At a savings rate of 37.99% in 2014, the People's Republic of China has a disproportionately high savings rate as compared to other OECD countries or to Japan (-0.39% in 2014) and Korea (7.18% in 2014)¹⁰², which may in part explain the conservatism of these respondent when it comes to taking undue risks in the face of a crisis or in handling money.¹⁰³

A second culprit may be the difference in format. Keysar *et al.* conducted all of their their experiments via computer. Their experiments were short and time-limited, and respondents had to respond to an item and then move on. The shorter time frame demanded more immediate reactions, and the respondents could not change their minds and return to previous items to amend their answers. In contrast, this survey experiment was administered on paper. The switch in format reduced the time pressure on respondents to respond quickly. Moreover, on a paper survey, respondents can go back and change their answer or skip over questions if they cannot decide on an answer immediately. Additional reflection time may have given respondents the opportunity to engage cognitive processing, thereby mitigating the influence of intuitive biases. However, as discussed above, I was still able to observe a significance difference in how respondents in difference language groups decided to accept unfair bets. Moreover, the small but consistent differences in where different language group accepted bets in the second experiment suggest that the switch to the paper format did not seem to mitigate all of the cognitive biases.

¹⁰² As a proportion of household disposable income: <https://data.oecd.org/hha/household-savings.htm>

¹⁰³ This may be contradicted by Gao *et al.* (2015), which reported that Chinese-English bilingual students who were childhood or late bilinguals were more susceptible to the "hot hands" bias with regard to performance on the Holt-Laury experiment.

Last, all of these experimental modules involved hypothetical scenarios, imaginary third parties, and fake sums of money. Ultimatum game research, as discussed earlier, has shown that partner characteristics can change the player's expectations about what is equitable and what is not. While I controlled the language to not mention a gender for the imaginary third party, my experiment does not know the identity of the third parties that the respondents imagined that they were playing against. Were they friends, family, or strangers in society? Given the strong emphasis placed on group membership, my respondents could have decided to be more magnanimous to an imagined colleague than to a relative stranger, or vice versa. In addition, the amounts discussed in the medium-stake and large-stake conditions in Experiments 2 and 3 represent substantial amounts of money. Respondents may have decided to be magnanimous because this amount is imaginary and not "theirs." As Raghubi and Srivastava (2008) discovered, consumers were much more likely to spend money using a credit card rather than cash, as they cannot as easily attribute the payment to any particular act of purchase. Along those lines, we may be able to observe respondents behaving much more strategically and conservatively if they were supplied with physical money, real or simulated, in hand for splitting.

Current experiments in decision science, this one included, have largely relied on foreign language learners as respondents. Foreign language learners acquire their L2 in a predominantly classroom setting, and they are thought to constitute the baseline with a minimal connection between affect and language. In this light, the relative inability of affective biases to influence decision-making is unsurprising. However, the greater literature on the connection between affect and language have documented that increasing proficiency in a language, brought on by greater frequency of use and immersion in that language's culture and society, can imbue L2 with

greater affect (Hsu *et al.* 2015, Opitz and Degner 2012). Whether affective biases return to influence decision-making for those bilinguals is a question that is not currently being studied.

Lerner *et al.* (2015) noted that decision theory has reached a consensus in which "many psychological scientists now assume that emotions are, for better or worse, the dominant driver of most meaningful decisions in life" (801). For Taber and Lodge (2013), affective reactions to internal and external events are essential to setting off further processing that finally ends with the emergence of thoughts and feelings that we think are consciously initiated (18).

Politics is rife with opportunities to make decisions at all levels of engagement. Political engagement itself begins with someone's decision to take notice of and to participate in the political forces that shape their society. Affect has been shown to influence candidate preferences (Brader 2005), to stimulate interest and involvement in a campaign (Marcus and MacKuen 1993), and to encourage participation in collective action (Tausch *et al.* 2011). The decision of who to vote for in the 2016 election, for example, was often an emotional one about which candidate she liked best, if she liked a candidate at all. Moreover, incidental affect can wield considerable influence over important decisions such as voting (Healy, Malhotra, and Mo 2010) and approval of politicians and their policies (Landau *et al.* 2004). Elites are not creatures of pure rationality either. Lawmakers operate in an environment of near-constant time constraints, stress, and conflicting constituent demands. Similarly, "[t]he mind of a foreign policy maker is not a tabula rasa: it contains complex and intricately related information and patterns, such as beliefs, attitudes, values, experiences, emotions, traits, style, memory, national, and self-conceptions" (Hudson 2005, 10).

What, then, of the bilingual? The potential difference in affect between their languages may mean the difference between a favorable first impression and a neutral or negative one,

which may influence whether that person decides to donate to a campaign, to vote for a politician, or more drastically, whether to go out and throw burning rocks in the streets. Just as Keysar *et al.* noted that the difference in affect may mean less bias when making investment or savings decisions, it may carry bigger implications for bilingual lawmakers or international officials, where it may make the difference when deciding between a riskier plan for negotiation and tried-and-true maneuvers. All are possibilities that, at the present moment, remain unexplored.

Chapter 3: Language Specificity Effect

What is memory if not the language of feeling, a dictionary of faces and days and smells which repeat themselves like the verbs and adjectives in a speech, sneaking in behind the thing itself, into the pure present...

Julio Cortázar, *Hopscotch* (1966)

When I first received a Social Security Card, my mother asked me to memorize the number in Chinese. Her reasoning centered around security concerns, as children were liable to blurt things out loud, and my state didn't have many Asian residents who would be able to understand me if I did. The unspoken consideration was likely a practical one, as having immigrated to the United States months earlier without any prior knowledge of English, my grasp of number words was still patchy, at best.

Whatever the reasoning was at the time, I frequently find myself in front of clerks as an adult, unable to provide my Social Security number when requested. It happens so often that I have developed a procedure for recall, which consists entirely of repeating the first digit—which is often all that I can recall in English with any degree of confidence—in Mandarin, at which time the sequence magically unlocks itself in memory.

The spontaneous evocation of a memory by the hearing or speaking of a certain language is not an uncommon phenomenon among bilinguals. Vladimir Nabokov lamented the long writing process for *Invitation of a Beheading*, his memoir, because his memory was more attuned to Russian than to English, the language in which he chose to write it (1967 [2011], 6). Aneta Pavlenko, noted bilingualism researcher and bilingual in Russian and English, recounted that she once gave the number to her childhood flat in the Soviet Union when someone used Russian to ask her for her current address (as cited in Marian and Neisser 2000). Respondents in Ayçiçeği and Caldwell's experiment on childhood reprimands (2004), discussed in Chapter 2, reported

remembering their parents saying the same words when hearing prompts in Turkish but not in English.

Psychologists argue that language-dependent recall is an extension of the *encoding specificity principle* (Tulving and Thomson 1973), which asserts that memories are more likely to be retrieved when conditions surrounding an attempt at recall match conditions that were present when a given memory was encoded. A number of studies have demonstrated that differences from mood to environmental conditions can affect memory retrieval (for review, see Davies and Thomson 1988). Eyewitnesses, for example, are often brought back to the scene of a crime in order to sharpen their recollections (Smith and Vela 1992).

The *language specificity effect* (Pavlenko 2005) argues that linguistic context, *i.e.* the choice of working language, is similarly capable of influencing recall in bilinguals. Marian and Neisser (2000) suggest that a memory may contain an external linguistic context, such as the conversations that the person heard or participated in, and an internal context, such as thoughts or mental commentary on the event (361). In addition, repeating parts of conversations or unique expressions in a particular language may also encourage recall if repeated (361). The language specificity effect has been documented extensively in autobiographical memory (for overview, see Schroeder and Marian 2013). More recently, Marian and Kaushanskaya (2007) and Pérez (2016) demonstrated that the effect extended to factual memory, finding that the linguistic context recall of both academic and political knowledge of bilingual subjects.

Given that political behavior research depends in large part on accurate self-reported data, how might the choice of working language affect the recall of a bilingual respondent in a survey context? This chapter investigates whether political participation, as reported by bilingual respondents, differ in the aggregate as a function of the linguistic context. My experiment

examines whether differences can be observed on two types of self-reported, media exposure and political discussion.

Memory and linguistic context

While human senses are extremely attuned to our surroundings, only a small amount of the information that we process is ever perceived consciously. Lodge and Taber (2013) estimate that we disregard about 98 percent of what we experience. When we devote sufficient attentional resources to an experience, the information that we focus on is channeled to the hippocampus and encoded, or in other words, "transformed into a mental representation that can be stored in memory" (Schroeder and Marian 2013, 3). Visual input takes up about 90 percent of our total processing capacity and often constitutes the bulk of the sensory information encoded (Lodge and Taber, 2), but other inputs, such as smells or sounds, may be included as well. In encoding, all of the information is channeled into the hippocampus, where the different inputs prioritized for retention and consolidated into a memory by forming new synapses between neurons. Once encoded, the memory is ready for retrieval, and over time, slowly migrates out of the hippocampus. Moreover, human memory is redundant, and we can often have multiple memories of the same experience.¹⁰⁴

Long-term memory is structurally more similar to decentralized systems like Wikipedia or the Internet rather than a centralized filing system. Memories are linked associatively in networks, with memories that share some common set of characteristics "clumping" closer together more than memories that do not, such as primarily visual memories clustered with other visual memories (Anderson 1983 and 1993, as cited in Taber and Lodge, 29). Just as we may look up a topic and then find ourselves sidetracked by clicking on links that contain associated

¹⁰⁴ <https://www.theguardian.com/education/2015/sep/16/what-happens-in-your-brain-when-you-make-a-memory>

information, the activation of one memory makes other memories in that network more accessible for retrieval.¹⁰⁵

"After encoding, an event that has already happened can be brought to mind and mentally relived through episodic retrieval" (Schroeder and Marian, 4). Just as the activation of one memory can activate other memories, the encoding specificity principle states that conditions present during a retrieval attempt can assist in activating memories with similar conditions encoded (Tulving and Thomson 1973), and activation by activating the relevance of a specific mechanism will strengthen that particular association. These conditions need not be central to the event being recalled. Contextual conditions, such as ambient temperature or a smell, can also assist in eliciting recall. The taste of madeleines, for example, triggers Marcel Proust's recollections of childhood in *Swann's Way*.

Language can facilitate recall, as memories may include external linguistic information, such as road signs, or internal linguistic information, such as a person's internal dialogue during an experience. For example, being surrounded by baby-talk may prompt a person to remember his own childhood experiences. A unique choice of words or usages can also facilitate recall. Test-taking services, for example, advise reviewers to associate information with memorable mnemonics (*e.g.* Memorizing "Please Excuse My Dear Aunt Sally" for the order of arithmetic operations); log-in screens often prompt users for forgotten passwords with presumably unique reminder hints.

Marian and Neisser (2000) suggest that, for bilinguals, the choice of language used to prompt retrieval can also affect recall. "Bilinguals experience some life events while using one language and some while using another, and the dramatic differences between those linguistic

¹⁰⁵ A similar idea will be discussed in Chapter 4, in which speaking a language activates additional knowledge associated with that culture.

environments may be particularly conducive to linguistic context effects" (361). The combination of external linguistic data, internal monologue, as well as specific vocabulary heard or said may facilitate retrieval attempts when made in the original language. Other contributing factors may include associations with a specific social and cultural environment, which may contribute to a language being able to readily call up memories about a specific time and place (see Chapter 4), or unique semantic or structural linguistic features that may shape the original encoding process. For example, many languages have grammatical gender, and Boroditsky, Schmidt and Phillips (2002) reported that Spanish speakers had an easier time associating apples, which are feminine in Spanish, with feminine names, while German speakers had an easier time associating apples, which are masculine, with masculine names.¹⁰⁶

Pavlenko (2005) refers to this phenomenon in bilingualism as the *language specificity effect*, and this line of inquiry harkens back to the debate over representation of words in lexical memory in Chapter 2.¹⁰⁷ Bugelski (1977), the earliest experiment on linguistic context, found that Spanish-English bilinguals¹⁰⁸ reported significantly different proportions of thoughts and memories depending on the language used to cue recall. With Spanish word cues, respondents reported that 45% of their thoughts were about events from their childhood, while with English word cues, respondents instead reported that 70% of their thoughts were related to life after immigrating.

¹⁰⁶ Though see overview and commentary by Wolff and Holme (2010)

¹⁰⁷ In that debate, the common-representation view conceptualized memories being stored in discrete chunks, while a more flexible view that suggested memories were instead stored in language-specific representations. Given recent advances in our understanding of how memories are formed as discussed previously, the flexible view championed by Durgunoglu and Roediger (1987) most resembles the current understanding of memory formation and retrieval.

¹⁰⁸ Subjects were 22 Spanish-English bilinguals who had Spanish-speaking backgrounds but had become virtually monolingual in the past 10 years. The mean age was 55.

Instead of relying on speakers themselves to enumerate and to classify their thoughts, most experiments instead use word cues (Schrauf and Rubin 1998¹⁰⁹) to prompt recall. Memories are described and then typically coded for characteristics like linguistic context, affect¹¹⁰, and time period by independent coders. Marian and Neisser (2000), for instance, inaugurated this trend by interviewing Russian-English college students who were also immigrants to the United States¹¹¹. In their first experiment, each participant was given eight cues in English and eight cues in Russian¹¹², and they were invited to tell brief stories from their own lives in response to each cue. The authors reported that participants recounted more pre-immigration memories when prompted with Russian word cues and more post-immigration memories when prompted with English word cues.¹¹³ In the second experiment, the researchers also manipulated the linguistic context of the experiment along with the word cue, and they found that the ambient linguistic context affected responses much more than the single-word stimulus did. Schrauf and Rubin (2000), Larsen *et al.* (2002), and Matsumoto and Stanny (2006) confirmed Marian and Neisser's findings on Spanish-English bilinguals¹¹⁴, Polish-Danish bilinguals¹¹⁵, and Japanese-English

¹⁰⁹ Interestingly, this experiment failed at finding a linguistic context effect on memory retrieval. Their subjects were 12 Spanish-English participants whose average age was 64.6 years (std. dev. was 2.9 years). All had lived in the United States for at least 30 years, and they had emigrated at a mean age of 28.0 years (std. dev = 5.7 years) (442).

¹¹⁰ Classification of affect can be self-reported or rated through coder observations.

¹¹¹ The participants for experiment 1 were 20 Cornell students who were Russian-English immigrants. Their mean age at immigration was 14.2 years (std. dev = 4.1 years), while their mean age at time of experiment was 21.8 years (std. dev. 2.9 years) (363). Experiment 2 participants were 24 Cornell students who were Russian-English bilinguals, none of whom had participated in Experiment 1. Their mean age at immigration was 13.4 years (std. dev. 2.4 years), and their mean age at the time of the experiment was 20.2 years (std. dev. 2.0 years) (365). The authors seemed to have made an effort at controlling for linguistic background and asked for a preferred language of communication for both participant groups. However, they did not provide information for the age and context of acquisition for L2 English.

¹¹² There were two sets of English word cues and two sets of Russian word cues. English and Russian cue sets were paired together, and each respondent was given one pair of cues. Half responded to English cues first, while the other half responded to Russian cues first.

¹¹³ One interesting side result was the participants recalling very few memories from the period during which they immigrated to the United States. The authors speculate that the lack of recall could be due to the mixed linguistic environment, or possibly due to the participants' inability to integrate the memories into existing frameworks (Bartlett 1932, as cited in Marian and Neisser 2000, 367).

¹¹⁴ Subjects were eight older Spanish-English bilingual immigrants originally from South America. Their average age was 65.6 years (std. dev. was 2.8 years, and their average age at immigration was 28.0 years (std. dev = 2.8).

bilinguals¹¹⁶, respectively. Matsumoto and Stanny is especially memorable as a rebuttal to Marian and Neisser's finding on importance of the ambient linguistic context, as they reported that the difference in the types of memories reported persisted even despite a mismatch between the general linguistic environment and the word cue. While most of their respondents chose to report their memories in Japanese, and 11 out of the 18 respondents had to request translation assistance for some of the English cue words (383).

Along with facilitating memory retrieval, linguistic context also affects the level of detail that is recalled. Javier, Barroso, and Munoz (1993) found that their bilingual respondents¹¹⁷ elaborated more and gave more detail when the language used to recounting a memory matched the language in which the experience had taken place. Both Marian and Kaushanskaya (2004)¹¹⁸ and Schwanberg (2010)¹¹⁹ also reported that bilingual respondents expressed more affect¹²⁰ in discussing their retrieved memories when the retrieval language matched the encoding language.¹²¹

Schrauf and Rubin are especially notable for their careful selection criteria, including immigration as an adult, at least 30 years of residency in the United States, and residence in a predominantly L2 English-speaking community (615).

¹¹⁵ These subjects were 20 Polish-Danish bilinguals, divided into two groups depending on their age at immigration to Denmark. Mean age of Early Immigrants was 51.4 years (std. dev. was 2.6 years), and the mean age at immigration was 24.1 years (std. dev. as 1.9 years). Late Immigrants were slightly older, with mean age at 61.4 years (std. dev. was 3.3 years), and the mean age at immigration was 33.6 years (std. dev. was 2.7 years).

¹¹⁶ Matsumoto and Stanny recruited 18 Japanese-English bilingual college students and 15 college students who were English monolinguals. For the bilingual group, average age was 22.7 years (std. dev. 2.65). Unlike Marian and Neisser (2000), these students seemed to have been Japanese nationals who were primarily in the United States for educational purposes. The majority reported first contact with English during middle school, with the remaining five beginning to study English during childhood.

¹¹⁷ Their respondents were 5 Spanish-English bilinguals, ranging from 29 to 66 years of age.

¹¹⁸ Subjects for this study were 47 Russian-English bilinguals who had immigrated to the United States from the Soviet Union. Average age for these participants was 21 years (std. dev. 2.6 years), and the mean age at the time of immigration was 14 years (std. dev. Was 3.4 years).

¹¹⁹ Respondents were 19 Spanish-English bilinguals with post-traumatic stress disorder (PTSD).

¹²⁰ Marian and Kaushanskaya relied on coder assessments of affect expression in participant accounts, while Schwanberg relied on self-ratings on the Clinician-Administered PTSD Scale (CAPS-1).

¹²¹ A possible counter to this observation may be Marian and Kaushanskaya (2008), who reported that bilinguals tended to use more emotion words, specifically negative emotion words, in L2 English than in L1 Russian to describe their immigration experiences. However, Marian and Kaushanskaya theorize that this may not be a function

Semantic memory has also received scholarly attention with regard to its retrieval sensitivity as a function of linguistic context. Semantic memory is the portion of long-term memory that is devoted to the storage of general facts that is not drawn from personal experience (Martin 2009), though the knowledge of certain facts can sometimes be inextricably linked with the personal experience of learning those facts. Marian and Fausey (2006) reported that Spanish-English participants¹²² were better at retrieving Spanish-language content when the instructional language had been Spanish as opposed to English, and vice versa. Moreover, participants were faster at retrieving answers when the retrieval and encoding languages matched. However, only balanced bilinguals displayed the expected difference in performance¹²³, which suggests that linguistic proficiency may affect how bilinguals organize information and respond to stimuli in different languages.

Marian and Kaushanskaya (2007) took a different tack, instead investigating whether linguistic context affected the store of culture-specific general knowledge that was retrieved. If a knowledge question contained multiple possible answers that were associated with different languages, then an MSM-English bilingual from mainland China may respond with the statue of Mao if asked in MSM; in English, however, he may respond with the Statue of Liberty. For univalent questions such as naming the capital of Illinois, the only possible answer would be Springfield. The authors asked a mixture of multivalent questions, those containing multiple

of the participant feeling more intensely in L2 English, but because L2 English may require more emotion words in order to compensate for its relative lack of affect as compared to L1 Russian.

¹²² Their subjects were 24 Chilean Spanish-English bilinguals who were living in Chile, a Spanish-speaking country. Their mean age was 22.0 years (std. dev. was 2.9 years), and they learned English between 0 and 12 years of age (mean age was 4.0 years, std. dev. was 2.5 years). The respondents were further classified as either a balanced bilingual (N = 10) or an unbalanced bilingual (N = 14). The experimenters used a within-subjects design, with each participant listening to some stories in Spanish and some stories in English between distractor tasks. The subjects of these stories included chemistry, mythology, biology, and history. Respondents were then asked to complete a short assessment in each language about the content of what they heard.

¹²³ For unbalanced bilinguals, the choice of retrieval language did not seem to matter when the encoding language was L1 Spanish. Overall, L1 Spanish-language retrieval attempts elicited far more accurate responses than English-language retrieval attempts. This may suggest that respondents who were less proficient in English may have been mentally translating and encoding the English-language content in Spanish.

possible answers associated with different languages, bivalent questions, those containing two possible correct answers that were associated with different languages, and univalent questions, those containing only one possible answer; during testing, the language used to ask those questions was varied by the interviewer.

For bivalent questions, Marian and Kaushanskaya found that their MSM-English respondents¹²⁴ were significantly more likely to access MSM-encoded information when they were interviewed in Mandarin than in English, and vice versa. The speed of retrieval was also faster for MSM-encoded information (927). In comparison, only the reaction times for univalent questions were affected by linguistic context.¹²⁵ In contrast to Marian and Fausey, Marian and Kaushanskaya did not find any accuracy or speed of retrieval differences between the balanced and the unbalanced bilinguals. The authors suggest that this lack of difference is actually due to insufficient differentiation between the language skills of the two groups.

Thus far, the consensus in experimental psychology is that linguistic context exerts significant influence on what is retrieved from episodic as well as semantic memory. The language used to for retrieval will increase the likelihood that a memory that was encoded with that same language will be recalled, and the speed of recall will be faster when retrieval language matches the encoding language of a targeted memory. There is some suggestion that a bilingual's fluency level in each of his languages will also affect the retrieval language's efficacy, with those bilinguals whose proficiency is similar across languages being less sensitive to linguistic context,

¹²⁴ They recruited 20 MSM-English bilinguals. No country of origin was listed, but given that the list of MSM stimuli was written in pinyin and largely referred to landmarks or common knowledge from the People's Republic of China, the participants were most likely from mainland China. Their mean age was 32 years (std. dev. 2 years), and they had started to learn English at an average age of 11.5 years (std. dev. was 0.60 years)

¹²⁵ This study was especially notable for its reported effect sizes. Language-dependency, presumably a match between encoding and retrieval language regardless of the actual language, was strong for multivalent ($\eta^2 = 0.80$) and bivalent questions ($\eta^2 = 0.66$).

but the evidence is not conclusive.¹²⁶ One issue that remains debated is whether a mismatch between the language of the word cue and the surrounding linguistic context, *i.e.* the language used to conduct the experiment, will further affect recall.

This consensus, however, was formed from experiments using small-N analysis, whose modal participants are sequential bilingual participants who live in his L2 culture and linguistic environment. The selection criteria result in relatively homogenous experimental groups, and the resulting differences in memory exercises can clearly be assigned to language. However, sequential bilingualism is only one acquisition path. As mentioned earlier, whether proficiency affects sequential bilingualism has not been adequately explored, let alone the effect of linguistic context on recall in simultaneous bilinguals. Last, while there has been great methodological unity among the episodic memory research studies in the use of single word cues, its practical applications are limited.

Moreover, because the word cues were given in language groups, *i.e.* cues were administered in groups by language, it is possible that some of the differences may have been the result of recency bias rather than sensitivity to linguistic context. In this scenario, Russian-language cues first activate a Russian-language memory because of similar linguistic conditions, and as a result, other Russian-language memories become more accessible to for future activation. The intrusion of English-language memories being reported in a mismatched linguist condition, in this explanation, may be due to a strong affective or thematic association with the word. Recency bias may have similarly affected the two semantic memory experiments, as questions were also administered in language groups.

¹²⁶ Recent research suggests that, as with affect and with Cultural Frame Switching, that growing proficiency in a language will also affect how memory is organized and processed (examples include Kroll and Stewart 1994)

Language and memory in political science, so far

The susceptibility of memory to the linguistic context surrounding retrieval is only beginning to receive attention in political science research. Currently, Pérez (2016) is the only study on this topic, investigating whether the language-of-interview--his term for the working language used to conduct a survey or an experiment—affects bilingual responses on political knowledge and attitudes. Following the research of Marian and her colleagues, Pérez proposes that "some concepts are more strongly linked to certain tongues" (604), meaning that a bilingual may be more likely to encounter a concept in a particular tongue, and that the use of that language will more easily activate and retrieve that concept from memory (605). Under this argument, bilinguals will encounter some political knowledge more readily than other political knowledge, such as through civic education in a particular language. Bilinguals who received Spanish-language instruction, for example, will be more likely than monolinguals to learn the identity of the President of Mexico, but probably will not differ in ability to identify the Prime Minister of the UK. Once encoded, such knowledge will be more easily retrieved when the interview language is Spanish.

With regard to political opinion, Pérez seems to suggest that language affects the expression of opinions by working in all three of Zaller's Receive-Accept-Sample (RAS) (1992) stages. First, the working language at the time of exposure affects the types of concepts that a bilingual is likely to receive.¹²⁷ As with political knowledge, a stronger link between a language and a political construct should mean that a person will be more likely to encounter that concept and encode it in the associated language (605).¹²⁸ Second, "people are more likely to encode a concept to memory if it matches the language they speak" (606), because the compatibility

¹²⁷ The example given and the concept tested was identity, *e.g.* American identity and English (609).

¹²⁸ "Encounter" is Pérez's own term, which I interpret to mean that a person has a greater likelihood of being exposed to some concepts in a particular language.

between language and concept makes it "less cognitively demanding to integrate a new idea into one's long-term memory, which is already populated by other concepts sharing the same language" (606).¹²⁹ Last, the working language at the time of retrieval will affect the knowledge that is accessible for a bilingual to sample when she draws upon it to give an opinion. He hypothesizes that respondents will report higher opinion levels when the language that they are interviewed in matches the language in which the target political concept had been encoded (606), and that these effects are less likely to be observed in constructs that are easily altered, such as anti-Obama sentiment, or are highly crystallized and stable, such as in partisanship. In addition to traditional political knowledge and Latin America-specific knowledge, he also tested differences in expression of identity, partisanship, and ideology

Results from two survey experiments with nationally representative samples of Latino respondents¹³⁰ suggest that both political knowledge and opinion are affected by the language of interview, though the results are more mixed for attitudes than for knowledge. On the political knowledge battery, Latino respondents interviewed in English performed better on traditional civics facts than those interviewed in Spanish.¹³¹ However, responses on opinion questions pertaining to identity did not behave as expected. While Pérez hypothesized that Spanish and the Latino identity would be connected, and that respondents would express more pride in Spanish, respondents in the English-language experimental condition in fact expressed more pride in their

¹²⁹ Pérez does not expand on this assertion. However, social psychology research, discussed in Chapter 4, suggests that bilinguals may be more likely to accept concepts that are consistent with expectations or beliefs that have been activated and made salient in a particular language. However, I have not found any research pertaining to the relationship between bilingualism and motivated reasoning.

¹³⁰ Both surveys were conducted online by GfK (formerly Knowledge Networks). The first survey had 472 respondents and the second survey had 1,131 respondents. Online supplementary materials provided the median age for the respondents (study 1: 42 years; study 2: 45 years), and some guesswork on dataset variables revealed that the average age of his respondents in Study 1 was 42.7 years (std. dev. was 16.0 years), and in Study 2 was 45.6 years (std. dev. was 16.1 years). No other language background data were provided.

¹³¹ In Study 1, OLS regression showed that being interviewed in English improved knowledge of traditional civics facts by 7.5% ($p < 0.05$). In Study 2, ordered probit regression found that when interviewed in English, the log-odds of improving 1 point on traditional civics questions increased by .252 ($p < 0.05$). No such effect was reported for Latin America-specific knowledge items.

Latino identity than those in the Spanish-language condition. Other attitudinal questions, including partisanship, anti-Obama feelings, and ideology exhibited similarly mixed results (Table 1, 612). Lastly, Pérez reported that English-language participants were faster to respond and were less likely to refuse to answer questions about traditional civics knowledge items, while Spanish-language participants exhibited a similar pattern with Latin America-specific knowledge items.

This article was groundbreaking in demonstrating that the linguistic context of the survey can affect measurement of political knowledge. In addition, it was innovative in demonstrating that differences in recall from semantic memory can be observed on an experiment using natural language stimuli on a large-N respondent sample. The magnitude of the differences observed between political knowledge levels between experimental groups was surprising, as the experimental design failed to account for a number of characteristics that experiments in psychology or bilingualism research would have considered essential. First, the pre-selection process accepted only respondents who had self-reported high proficiency in both English and Spanish (608). In addition, while the respondent sample may have been representative on desired demographic characteristics such as age or gender, the respondents likely came from a mix of linguistic-acquisition backgrounds, probably lived in very different linguistic-use contexts within the United States, and thus possessed different domain proficiencies in each language. Thus, the modest differences in reported knowledge and attitudes found in these experiments likely represent a lower bound on the potential effects of language.

Of the mixed results, unexpected difference in the question pertaining to pride in one's Latino identity suggests that the correspondence between concept and language may not be as straightforward as the author hypothesized. While Spanish is the national language of multiple

Latin American countries, the concept of a Latino identity is most salient in the American political context, where voters of a similar background may band together to vote on common interests, such as on immigration. The Spanish-language context may instead override the salience of a pan-Spanish-language identity in favor of activating the salience of the national identity of a respondent, such as being of Peruvian descent.

Adding language to episodic recall in political science

How might linguistic context affect recall from episodic memory, and how do differences in recall affect our understanding of political behavior? Political behavior research relies on having accurately self-reported data on a variety of topics, including voting and media consumption. While ample research has demonstrated that respondents are often unreliable reporters on topics such as voting history (see, *e.g.*, Anderson, Silver, and Abramson 1986) or media exposure (Prior 2009), and while the search is on for measures that can more objectively capture respondent behavior, our reliance on self-reported data has not decreased amidst the rush to locate better measures that can more accurately or objectively measure respondent behavior (Dilliplane, Goldman, and Mutz 2013, Prior 2013).

Bilinguals add a new wrinkle to the puzzle that is self-reported data, as their behavior as well as the way that they remember that behavior may differ from that of the modal monolingual. With regard to news exposure, for example, bilinguals have access to alternate sources of news, each of which may offer different content and a different style of coverage. She may make very important choices about whether to obtain the majority of her news in L1, L2, or split her attention equally between sources. When asked to recall how much news a respondent had been exposed to that week, the language used on the survey or the interview may affect how well he

recalls watching news that had been broadcast in different languages, thereby raising the possibility that he may drastically mis-estimate¹³² his actual news exposure. The specific question wording on a survey or in an interview may also affect recall. Though it is now common practice for master questionnaires to be translated into a local language and then back-translated to ensure accuracy (Harkness, van de Vijver, and Mohler 2002)¹³³, the need to balance translation fidelity with functional equivalence (Przeworski and Teune 1966; Elkins and Sides, unpublished) across versions may mean that the preferred translation may not accurately measure the desired underlying concept (Pérez 2009).¹³⁴

This chapter presents the first experiment to study the methodological implications of differential episodic recall in bilinguals in political science. I investigate whether using different languages in a survey affects how Chinese bilinguals recall and report their exposure to political news and how they report political discussion in the media.

I analyze news consumption and political discussion responses of 190 respondents.¹³⁵ Overall, 91 respondents were randomly assigned to the MSM-language condition, while 99 were randomly assigned to the English-language condition. Of the 187 respondents who gave some

¹³² Most likely under-estimate.

¹³³ Quality control is often a problem as well. I reviewed the MSM and English versions of the World Values Survey and AsianBarometer when designing my own survey. In the process, I found numerous errors in translation in the local language versions. Given that the technical reports for these local versions give no details about how the data were cleaned, and because the codebook and variable names are only available in English, it is quite possible that the available data fundamentally misrepresents the response distributions for some questions. For example, the Wave 4 Questionnaire of the World Values Survey asked PRC respondents about whether they vote in every election. The last option in English reads "Hardly ever", but the last option in MSM reads "I don't vote".

¹³⁴ While designing the survey experiments for this dissertation, I showed the questions to a local expert in surveys. He took issue with the use of 政治 (literally "politics") in questions, such as whether the respondent had watched various kinds of news about politics or had discussed politics with others. While there the term is technically correct, he asserted that the term is sensitive and signals the users to be careful about how they answer a question. He claims that local surveys, including those administered by the Central Party School, use euphemisms such as 国家大事 (happenings in our country) to refer to political matters. I have confirmed this wording preference with locally-designed surveys as conducted by the Research Centre for Contemporary China at Peking University.

¹³⁵ These were respondents from Version 1 of my survey experiment. I am unable to use the MSM-language respondents from Version 2 due to an unexpected modification of the wording used to describe "politics". However, the English wording remained unchanged, and I will be using those respondents in an extension of my analysis in a later section. For details about survey administration and the differences between versions, see Appendix A.

demographic information, their ages ranged between 17 and 28. Average respondent age was 20.1 years (std. dev. was 2.0 years), with the median voter being 20 years of age. Respondents were overwhelmingly female, with 159 females and 28 males.¹³⁶ Respondents were asked to assess their respective linguistic proficiency on a scale from 1 to 10, with 1 being least proficient and 10 being fluent. The average self-rated proficiency of the MSM-language respondents was 8.4 (std. dev. 1.3), and the average proficiency of the English-language respondents was 7.3 (std. dev. 2.0).

In addition to differences in proficiency that have been discussed previously, for these respondents, the domains of competence for each language are in different aspects of life. For these bilinguals, English is primarily a language for education and for entertainment, while MSM is the language for everyday life, including for political participation. Because the state tries to regulate the available sources of news and also to restrict the language in which it is broadcast to MSM¹³⁷, and because taking part of any sort of political activity, including discussion, in mainland China most likely occurs in MSM¹³⁸, the most effective retrieval language for episodic recall experiments in Beijing should also be MSM.

H₀: There is no difference between how English-language respondents and MSM-language respondents report their voting habits and news consumption, in the aggregate.

Language may not affect recall for bilinguals who consume news and discuss its contents in only one language. They may be equally able to recall—or not recall—their behavior in either language. For respondents in the English-language condition, they may simply translate the request to MSM to jog their memory.

¹³⁶ This was, unfortunately, a reflection of the gender imbalance in Chinese higher education. All departments that I was able to survey had similar levels of gender imbalance.

¹³⁷ See Zhang and Guo (2010) for a discussion of some exceptions.

¹³⁸ While this situation may be different in Tibet and Xinjiang, or in autonomous regions elsewhere, all official communications in Beijing are made in MSM.

H₁: English-language respondents will report fewer instances of news consumption and political discussion than their MSM-language counterparts.

However, according to the literature on the language specificity effect, a memory is more easily recalled when the retrieval language matches the language in which an experience was encoded. Given that participants will likely obtain most of their news in MSM and discuss it with friends and family in the same language, then MSM-language respondents should be more likely to recall those activities.

Additional factors may contribute to recall, though there is no theory in the comparative realm that can account for the direction of difference, if one exists. In all instances discussed below, however, I anticipate that English-language respondents will report *more* instances of political discussion and news consumption, as will be discussed below.

H₂: English-language respondents will report more instances of participation and news consumption than their MSM-language counterparts.

Prior (2009a) pointed out that "[s]elf-reports of regular news exposure are reliable measures of how much news people think they watch" (137). In the American context, respondents routinely overestimate their news exposure due to their combining imperfect recall with heuristics, with the most likely culprit that of incomplete recall, with some demographics exaggerating their news consumption by a factor of three (138). Social desirability bias leads respondents, particularly those who are highly educated and are committed to the norm of voting, to over-report their own voting history (Anderson, Silver, and Abramson 1986), in turn leading researchers to over-estimate the magnitude of the relationship between the act of voting with those characteristics and values.

While a similar principle may hold with respect to news consumption and discussion in the People's Republic of China, little emphasis is actually placed on those activities as virtues. "In contrast with the Western democratic tradition that emphasizes sovereignty, participation in politics, and civil rights, citizenship in China is seen as a benefit granted by the State to persons born in the People's Republic" and rights are "framed as economic, social, and cultural benefits" that citizens derived from living under the State's protection (Keane 2001, 2). While political awareness is encouraged for members of the Communist Youth League and the Communist Party, that awareness is geared towards having a solid grasp of Marxist basics and being up-to-date on key ideological nuances currently in vogue, not general awareness of the news. Similarly, political discussion is used to demonstrate public mastery of the ideological material.

However, the English-language survey may be signaling to the respondents that their answers will be reviewed by foreign researchers. That belief, in turn, could activate the salience of group identity, that of a citizen of the People's Republic of China, which in turn activates social desirability bias, and encourages the respondents to overestimate their activity level in order to look good to outsiders.¹³⁹ Alternately, asking a question in MSM about political discussion with close friends and family, which is usually understood to be a safe space that allows for sensitive topics to candidly broached, may evoke fear or caution in those respondents, causing them to underreport their activity. Either of these may be likely, as students were given a preface with their paper survey packet that informed them of their rights and privileges as survey respondents. The inclusion of this type of information is highly uncharacteristic for a survey administered in China, and may have caused some subjects to fear that something was amiss.

¹³⁹ If language does indeed make the group identity more salient or activate social desirability bias, then per Kemmelmeier and Cheng (2004), female respondents may be more susceptible to the language cues.

Last, being asked to take a survey in English may heighten or distort recall and judgment. First, respondents may experience foreign language anxiety, or feelings of discomfort or anxiety that arise when a speaker is asked to use a language in which he has low confidence, despite considerable instruction. According to Alter *et al.* (2007), foreign language anxiety can activate cognitive processing (per Chapter 2), in turn motivating the English-language respondents to try carefully to recall all of the instances of some behavior. Second, because behavior questions usually offer frequency descriptions as options, *e.g.* "I do (activity) often" rather than more precise numerical quantities during which an activity was performed, respondents must pass judgment on whether their own behavior matches one of the provided terms, and they may be wrong. While isolated differences in interpretation will likely cancel out in the aggregated data, I suggest that systematic distortion, such as foreign language anxiety or systematic differences in how they interpret foreign vocabulary, may cause respondents to overinflate their estimates in English, as they may be more lenient with what constitutes a specified activity than they would have been in their native tongue.

Operationalizing media exposure and discussion

In the liberal democratic tradition, increased news consumption is generally conceived of as a virtue, as it in turn increases the total store of political information that a person possesses. "Exposure to political information is thought to influence how much people know about politics, how they feel and think about politics, and whether they participate in politics" (Prior 2009, 130).

Less is known about the effect of media consumption with regard to Chinese political participation. However, when collecting information about media consumption, it is important to

remember that "mass media in authoritarian and other illiberal regimes are always influenced to varying extents by their states so as to forge supportive sentiment" (Zhu, Lu, Shi 2013, 926).

While the media is no longer state-owned or financed, the state retains enormous influence over its content, which includes the language of coverage. The PRC government continues to use these platforms for mobilization and propaganda.

I operationalize media consumption in this study as the frequency of a citizen obtaining news about politics from different media platforms. The questions were adapted from the Fourth Wave questionnaire of the World Values Survey (WVS 4, 1999-2004)¹⁴⁰. I added Internet as a media option. The text read as follows:

People use different sources to learn what is going on in their country and the world. For each of the following sources, please indicate how often you used the following sources to obtain news about politics last week.

The media platforms provided were daily newspaper, television, radio, and Internet; the options for frequency ranged from 1 to 5, with the choices being "Everyday" (1), "Several times a week" (2), "Once or twice a week" (3), "Less than once a week" (4), and "I don't use it" (5). Because these responses are descriptors, the respondents likely had to interpret their numerical estimate of consumption to fit with a frequency term, and it is a very strong assumption that the convenience codes above, with interval properties, reflect respondent interpretations of the terms.

Similarly, the western political tradition holds political discussion to be key to good democratic governance, as frequent exchanges may foster "mutual respect and the development of a common will" (Conover, Searing, and Crewe 2002, 22). Historically, there has been little study devoted to political discussion in China. Though online discussion and its study has

¹⁴⁰ The first wave of the AsianBarometer (AnB 1, 2001-2003) in mainland China, Hong Kong, and Taiwan superseded the media exposure questions on the Core Questionnaire with an aggregated media exposure question similar to that of WVS 4.

flourished in recent years (Li and Chan 2017, Mou, Atkin, and Fu 2011, Zhou, Chan, and Peng 2008), that discussion is still heavily monitored and regulated by corporate as well as government censors¹⁴¹.

In contrast, traditional measures of political discussion in China, or at least data collection about its frequency, often include a measure to estimate frequency of discussion between friends and family, "safe" individuals with whom a person may feel comfortable in discussing sensitive topics and potentially criticizing government policies. That discussion may often involve the examination or the passing on of rumors or other information that is unsubstantiated by the media, and Zhu *et al.* (2013) reported that people who more frequently passed on and discussed rumors were more likely to believe that corruption is more prevalent in China. However, increased news consumption via popular media, such as the platforms discussed above, seems to mitigate that belief.

This study operationalized political discussion as the estimated frequency with which a person discussed politics with family and close friends. The question was also taken from WVS 4, and a similar version of this question, disaggregating audiences, has been a part of the AsianBarometer since its inception. The wording is given as follows:

When you get together with your family member or friends, how often do you discuss political matters?

The options for frequency were "Frequently" (1), "Occasionally" (2), and "Never" (3). Again, because these choices are subjective descriptors, the responses are most likely not equally distant from each other, and any analysis treating the variable as having interval properties rests on a strong assumption.

¹⁴¹ <https://www.pri.org/stories/2013-06-03/7-things-you-cant-talk-about-china>

Media Consumption

Table 3.1 and Table 3.2¹⁴² provide the frequency, relative frequency, and descriptive statistics (on the assumption of interval properties) of self-reported consumption of political news via newspapers. The median choice in either language was "Less than once a week", though the modal choice was not to read newspapers at all. The response distributions for both languages are left-skewed (see Figure 3.1). Almost 52% of MSM-language respondents claimed to have read a newspaper either less than once a week or once or twice a week. In comparison, less than 46% of English-language respondents claimed to have read a newspaper either less than once a week or once or twice a week. The 5% washes out in the "do not use" category, where 39% of English-language respondents claimed not to have read a newspaper, versus 34.9% of MSM-language respondents who selected the same.

While the modal frequency of consumption of political news from television is the same for both MSM-language and English-language respondents, the median frequency of consumption for MSM-language respondents ("Once or Twice") is higher than that for English-language respondents ("Less than Once a Week"). The distribution of the English-language responses is unimodal, with the left tail (higher frequency of news consumption) being thinner than the right tail (lower frequency of news consumption). The MSM-language responses instead look to be bimodal, with the most responses at "Once or Twice" and a slightly smaller peak at "Do not use" (Figure 3.2). More respondents across the board uses this media platform, as 27.1% of MSM-language respondents and 24.2% of English-language respondents reporting that they do not consume political news through television, which is about 10% less than those who

¹⁴² Though I do not consistently assume that the response choices are equally distant, I provide mean and standard deviation for each type of consumption to describe the spread of answers in each language. This holds true for the remaining tables. However, aside from the slightly larger standard deviation on radio news, the statistic was relatively similar for all other platforms.

responded that they do not consume political news through newspapers. While few respondents reported watching television every day, most respondents seemed to watch television occasionally, with 70.6% of MSM-language respondents and 71.4% of English-language respondents selecting the middle three options ("Several Times", "Once or Twice a Week", or "Less than Once a Week").

Figure 3.3 shows that while the median habit was consuming radio news less than once a week, the modal habit was not to use the platform. This was the platform most ignored by the respondents, with 39.3% of MSM-language respondents and 46.2% of English-language respondents reporting that they "Do Not Use" the radio. More English-language respondents than MSM-language respondents reported that they listened to the radio "Everyday" (7.7% versus 3.6%), though more MSM-language respondents (57.1%) reported that they listened to the radio occasionally as compared to English-language respondents (46.2%)

Internet news consumption reigned supreme among my university respondents (see Figure 3.4). "Everyday" was both the median and modal choice, with 57.3% of MSM-language respondents reporting that they read it every day, versus 62.2% of English-language respondents. Interestingly, MSM-language and English-language respondents are largely similar except on "Once or Twice", where 6% more MSM-language respondents selected the option.

Tables 3.3a and 3.3b show the frequency and relative frequency distribution of political discussion with family and close friends. Figure 3.5 displays the relative frequency distribution in visual form. More English-language respondents (about 12%) reported that they had frequently discussed politics, while MSM-language respondents were more likely to respond that they "occasionally" discuss politics, with 87.5% of answering thus as compared to 76.8% of the

English-language respondents. A similar number of respondents in both categories reported that they do not discuss politics.

Does language affect the pattern of recall on media consumption? Because the responses are clearly ordered, but not obviously categories falling at equal intervals on a "scale", I do not assume that they are equally distant. Thus, besides inspecting the distributions both numerically and visually, I also conduct Mann-Whitney's U test on all of the response distributions from all media exposure and discussion questions, and the language used was not significant in any tests.¹⁴³ My results do not reject the null hypothesis (Table 3.4), suggesting that English-language and MSM-language respondents respond similarly to news consumption questions by platform. In other words, the patterns of recall exhibited by respondents taking the survey in both languages look similar to each other.

Sampling matters

Though the results reported above suggest that MSM-English bilinguals do not exhibit language specificity effect when reporting on the frequency of their news consumption, which seems to confirm the null hypothesis (H_0), I now examine several factors that may have influenced my experiment. The first is the selection of participants: my experimental population is a convenience sample of departments at Capital Normal University, and I was able to access to available and willing respondents in those departments only after obtaining permission from the departmental authorities.¹⁴⁴

¹⁴³ Mann-Whitney's U Test assumes homogeneity of variances between groups. Because I could not assume that the data were normally distributed, I used the Fligner-Killeen test, a non-parametric test, to compare variances between experimental groups on all questions. I was able to reject the alternate hypothesis, that the variances of language groups on heterogeneous, on all questions. I reexamined the data with an assumption of intervality and checked all results by estimating ordered probit models, which corroborated the null results.

¹⁴⁴ More details about the survey experiment and how it was administered, including the full list of departments that I was able to survey, can be found in Appendix A.

The data for this chapter came from surveys that were administered in the Department of Chemistry ($N_{\text{Chem}} = 95$) and the Department of Foreign Languages ($N_{\text{FL}} = 96$). The majority of students enrolled in the Department of Foreign Languages are English majors. Students in this department, regardless of language concentration, are required to pass a higher level of the College English Test (CET), and their coursework very likely requires constant engagement of English-language media in order to improve their overall mastery of the language. As Sears (1986) and as Heinrich *et al.* (2010) have pointed out on very different levels of analyses, heavy dependence on one type of experimental subject can distort the conclusions that we can draw from them. A narrow sampling frame can misrepresent relationships or wrongly describe the strength of a relationship, if present. In this case, the inclusion of Foreign Language students in this sample, specifically the 62 English majors among them, may have affected the type of media that many of the respondents consumed on a regular basis.

Keeping that point in mind, I separate the respondent sample into subsamples, consisting of the Department of Chemistry and the Department of Foreign Languages, for further analysis. Table 3.5 provides the demographic information for both groups. The respondents in Chemistry were, on the whole, younger than Foreign Language students, and oddly enough, reported both higher MSM ability and English ability than the respondents in Foreign Languages. The split between experimental groups was a bit more balanced in Foreign Languages (47 MSM, 48 English) than in Chemistry (44 MSM, 51 English).

Tables 3.6a and 3.6b give the frequency counts for Chemistry and Foreign Languages respondents, respectively, while Tables 3.7a and 3.7b give the relative frequency counts for the two departments. However, the figures are more illustrative of department-wide habits. Newspaper consumption, when disaggregated by department, now looks very different. Both

MSM- and English-language respondents read newspapers rarely ("Once or Twice", or less frequently) in the Chemistry Department (Figure 3.6a); though newspaper consumption is still low in Foreign Languages, the distribution forms a less distinct peak (Figure 3.6b). About 10% more English-language respondents in Chemistry responded that they do not read newspapers as compared to MSM-language respondents.

Television news consumption looks very different between departments. Both the mode and the median are different between departments. Consumption habits reported by Chemistry respondents look very similar regardless of language. Both frequency distributions resemble a gently sloping hill, with the most respondents reporting that they watch television "Once or Twice" or less (Figure 3.7a). In contrast, the biggest proportion, about 40%, of Foreign Languages respondents in both language conditions report that they watch television "Once or Twice" a week (Figure 3.7b).

Chemistry respondents are united in their disdain for listening to the radio "Everyday" (Figure 3.8a), though the pattern diverges from there. While the distribution of MSM-language responses monotonically increases as consumption frequency decreases, with most respondents (more than 40% in both experimental conditions) reporting that they "Do Not Use" the radio, the next largest group report that they listen to the radio "Less than Once". By contrast, while the largest proportion of respondents in Foreign Languages report that they do not listen to the radio (37.9% MSM, 46.8% English), they are much more equivocal about the frequency of radio news consumption across the other categories. About 10% more English-language respondents report that they listen to the radio "Everyday" as compared to MSM-language respondents (Figure 3.8b).

Internet news consumption is supreme across respondents in both departments, though more Foreign Languages respondents report reading "Everyday" as opposed to Chemistry respondents. In both departments, about 5 to 7% of English-language respondents responded that they read news on the Internet as opposed to MSM-language respondents. While the habits of Chemistry respondents monotonically decrease slowly across decreasing frequency of consumption, most of the Foreign Languages respondents who do not read Internet news everyday are concentrated in the "Several times" and "Once or Twice" categories (Figure 3.9b).

Finally, aside from slight differences in reporting percentage, the distribution of responses on political discussion with family and close friends look virtually identical (Table 3.8a, Table 3.8b, Figure 3.10a and Figure 3.10b). Slightly more English-language respondents report that they discuss politics frequently in both Departments, while about the same percentage of MSM-language respondent report that they discuss politics occasionally.

I now present formal statistical tests to examine whether news consumption habits between departments are substantially different. I first examine whether responses between departments in a particular language condition differ by media platforms. In the MSM-language condition, I find that the response distributions of newspaper and radio between departments in the MSM-condition did not have homogeneity of variances. There were also significant differences in the distribution of MSM-language responses in newspaper ($p < 0.01$) and television ($p < 0.05$). As a last check, I assume that response categories are equally distant and perform a two-sample t-test on each media platform, and I find that the mean responses of both newspaper (Chemistry mean 4.13, std. dev. 1.06; FL mean 3.52, std. dev. 1.21) and television (Chemistry mean 3.85, std. dev. 1.04; FL mean 3.35, std. dev. 1.12) were significantly different

(both $p < 0.05$). Recall of discussion with family and friends was similar across language conditions.

I perform similar checks for responses in the English-language condition. This time, only the response distributions for radio news consumption did not have homogeneity of variance. Similar to the MSM-language condition, both the response distributions for newspaper and for television were significantly different by department, suggesting that students in departments had very different consumption habits in those platforms. Again, as a last check, I assume that the response categories are equally distant and perform a two-sample t-test on each media platform. This time, I find that the mean responses of television (Chemistry mean 4.20, std. dev. 1.13; FL mean 3.23, std. dev. 1.11), and radio (Chemistry mean 4.20, std. dev. 0.5=93; FL mean 3.64, std dev. 1.54) to be significantly different ($p < 0.05$), and the mean response of newspaper consumption by department (Chemistry: 4.20, FL: 3.5) to be highly significant ($p = 0.005$). Similarly, the response distributions for frequency of discussion with family and friends were not significantly different from each other.

Now that I have established that the consumption habits across media platforms look very different depending on the department surveyed, I return to comparison of MSM-language and English-language responses, now *within* those departments. Once again, I examine the response distributions by platform with Mann-Whitney's U Test (Table 3.10a and Table 3.10b). I find that the response distributions by media platform in both Chemistry and Foreign Languages seem to have homogeneous variances, and the distributions of responses were also not significantly different as a function of the language used to respond to the experiment. In layman's terms, while the recall of consumption and discussion patterns varied greatly *across* departments, the consumption patterns within the departments were similar across languages.

Sampling matters, redux

The second factor to be examined is that of English proficiency. As mentioned in the previous section, both the departments of Chemistry and Foreign Languages reported unusually high proficiency in English sample (N=99, mean = 7.34, std. dev. = 2.04) as compared to the pooled English-language sample (N = 246, mean = 6.8, std. dev = 2.19) or the English-language responses from Version 2 of the survey (N=147, mean = 6.43, std. dev. = 2.22).

In Marian and Fausey's experiment on semantic recall (2006), the authors reported that balanced proficiency across languages affected recall. Bilinguals with more equal proficiency across their languages exhibited the expected language specific effect, that of being more likely to recall L1-specific knowledge when prompted in L1 and to recall L2-specific knowledge when prompted in L2. However, unbalanced bilinguals, those who were more proficient in L1 in their experiment, produced more errors when the retrieval language is L2, regardless of which language they had used originally to learn the material. This pattern concurs with that found in other studies (discussed in Chapters 1 and 2) that have found that increased proficiency in a language, including a second language, changes how bilinguals process and organize information, including affect, in that language. However, Marian and Fausey remains the only experiment to date to have accounted for differences in proficiency as an explanation for differences in observed behavior.¹⁴⁵

Proficiency may also affect episodic recall, though the exact effect mechanism is unknown. It is difficult to extrapolate from Marian and Fausey's logic, as most of these

¹⁴⁵ The reliance on convenience sampling means that experimental psychology studies often have very low N. Even if their subjects did not have relatively homogeneous backgrounds, the low number of subjects reduces their ability to draw any bigger conclusions from the data aside from marking the unusual behavior as an outlier. While Pérez was able to conduct very large-N experiments, his design automatically eliminated potential respondents if their self-reported proficiency for conversing and writing in both languages was other than "1", or "Very Well". In other words, his research design had eliminated variations in proficiency as a potential influence on his outcome of interest.

respondents will have consumed relatively more MSM-language media than English-language media. If we assume that the Version 1 respondents are relatively balanced in proficiency, then we should have expected them to display the language specificity effect, which they did not. Conversely, if we assume that the Version 1 respondents are still relatively unbalanced in proficiency, then we should have seen greater accuracy in recall in MSM but not in English. If we assume the response categories to be equally distant, one symptom of greater accuracy may have been smaller standard deviations for MSM-language responses than for English-language responses. While Table 3.2 seems to confirm this hypothesis, the disaggregated descriptive statistics in Table 3.7a and Table 3.7b would suggest that the larger standard deviations in the English-language condition were actually due to differences in media consumption between the two departments.

Most experiments collect information on language proficiency by asking the bilingual to provide a self-reported assessment on the target linguistic abilities. While self-reported proficiency does not necessarily reflect true ability in a language, it is likely to be positively correlated with ability. In addition, self-reported proficiency is often as reflective of a person's confidence in her language abilities as it is of her true ability (MacIntyre, Noels, and Clément 1997). Conversely, low self-rated proficiency may imply the presence of Foreign Language Anxiety (FLA). As discussed in Chapter 2, FLA is thought to activate cognitive processing because the "perceived difficulty of judgment at hand" gives the speaker no confidence in the accuracy of his intuitive judgment (Alter *et al.* 2007, 569). With respect to memory, survey questions often employ descriptive categories (*e.g.* "Several Times", "Less than Once") as opposed to numerical counts for the frequency of an occurrence. When faced with an English-language questionnaire, respondents with lower proficiency in English may have lower

confidence in their recall as well as lower confidence in their selection of categories. In keeping with my original hypothesis H_1 , I anticipate that lower-proficiency English-language respondents will also recall less news consumption.

This section compares the MSM-language respondents that have previously been analyzed ($N=91$) to both the English-language respondents from Version 2 of the survey ($N=147$)¹⁴⁶ as well as the pooled sample of English-language respondents across both versions of the survey ($N=246$). The language groups should be comparable, as the wording used on the English-language questionnaire was directly equivalent to the first version of the MSM questionnaire. In addition, the questions on media consumption used in this chapter were on the first page of the survey, which remained unchanged throughout the survey. I therefore assume that respondents would not have been influenced by any changes on the subsequent modules, which in the English version consisted only of question deletions. Though the last section revealed that the news consumption habits between departments differed, I anticipate that this gap will be counterbalanced by a similar mixture of departments that answered the second version of the survey.¹⁴⁷ I will primarily discuss differences between the MSM-language responses and the Version 2 English-language responses, but I will note divergences in the pooled English-language responses if they occur.

Table 3.12 provides demographic characteristics on the two English samples used in this part of the analysis. Average age for all of the samples is similar at about 20 years of age, though the standard deviation is higher for the MSM sample than either of the English samples. This

¹⁴⁶ The respondents who took Version 2 of the survey experiment came from the Department of Chinese Language, Information Technology, Early Education, and Computer Science.

¹⁴⁷ Though the psychology experiments that did not use a within-subject design randomized language conditions, they are still randomizing on a convenience sample consisting of recruited bilinguals, and it is questionable whether they were able to sufficiently balance all underlying characteristics. I anticipate that the randomization in my survey experiment will have at least achieved parity with these studies.

difference likely arises from slightly different age averages for the two departments in the sample (see Table 3.5). All of the samples continue to exhibit a severe gender imbalance, but the percentage of students who are female is smaller in the English-language groups (87.9% female in the MSM-language group, 69.1% female in V2 English-language group, 77.0% female in the pooled English-language group). Self-assessed MSM proficiency was high, at 8.41 (std. dev. 1.29), while the V2 English proficiency was much lower, at 6.43 (std. dev. 2.22) (pooled group average 6.8, std. dev. 2.19).

Looking at the response distributions for newspaper consumption (Figures 3.11a and 3.11b), the English-language respondents were more evenly distributed among the response categories, though 10% more selected the "Several Times" category than their MSM counterparts. In contrast, 5% more MSM respondents selected the "Once or Twice" category. The median category for both language groups was "Less than once", so not an often-used platform overall.¹⁴⁸

The response distributions for television consumption (Figures 3.12a and 3.12b) look very different between the language groups. While the median consumption category in both languages was "Once or Twice", about 15% more English-language respondents selected the "Several Times" category, and about 18% more MSM-language respondents selected the "Do Not Use" category. In addition, about 6% English-language respondents selected the "Everyday" category than did the MSM-language respondents.

By contrast, there was very little difference between the response distributions for radio news consumption (Figures 3.13a and 3.13b). Both distributions were increasing monotonically

¹⁴⁸ Tables 3.14 and 3.15 provide descriptive statistics on the response distributions for the news consumption and political discussion questions. The descriptive statistics do assume that the response categories are equally distant, which we should not take to be a true reflection of their frequency consumption. However, these statistics can be instructive in telling us about how the respondents chose their answers.

as consumption lessened in frequency. English-language respondents listened to radio very sporadically or not at all. The median consumption frequency was, again, "Less Than Once" for both groups.

While news consumption on the Internet was the median and modal response category for how both language groups got their daily news, more English-language respondents reported that they read news online everyday than did MSM-language respondents (75% as compared to 62%) (Figures 3.14a and 3.14b). A similar percentage of MSM-language respondents, approximately 11%, responded that they listened to the radio "Once or Twice" more than English-language respondents. The difference in the smaller frequency categories was negligible.

Last, Table 3.14 showed that the pattern of difference between the two language groups with regard to their frequency of political discussion looked similar to the pattern found among just the Chemistry and Foreign Languages respondents: more English-language respondents report that they "Often" engage in political discussion (approximately 14%), while more MSM-language respondents report that they "Occasionally" engage in political discussion (13%) (Figures 3.15a and 3.15b).

Moving on to statistical tests (Tables 3.15a and Table 3.15b), I again use Mann-Whitney's U Test to examine whether differences between the response distributions were statistically significant, and I find that the difference between response distributions for television news consumption was highly significant (MSM median = 3, English median = 3, $p < 0.001$), and the response distributions for frequency of political discussion was significant (MSM median = 2, English median = 2, $p < 0.05$).¹⁴⁹ η^2 calculations show that about 7% of the variance

¹⁴⁹ These differences were confirmed with independent-sample t-tests (assuming equality of distance between categories) and with ordered probit. T-test results are listed in Tables 3.16a and 3.16b.

in television news consumption can be attributed to the difference in language, while about 3% of the variance in frequency of political discussion can be attributed to the same.¹⁵⁰

Discussion

To recap, I had expected that the language specificity effect would manifest as English-language respondents being more likely to respond that they had consumed news less frequently across all media platforms. In numerical terms, the response distribution of the English-language respondents should have resembled the response distribution of the MSM-language respondents, but with more respondents answering in the lesser frequency categories.

However, my data do not exhibit this pattern. In the first part of my analysis, I found no differences between the response distributions of the MSM-language respondents and the English-language respondents. The two experimental groups in this part of the study were directly comparable, as they were part of the same educational community, and their language group assignment had been randomized. Because I suspected that underlying factors, in this case departmental affiliation, affected their respective media consumption habits, I undertook a closer analysis by disaggregating the sample by departmental affiliation and then repeated the previous tests. While the samples now had relatively low-N, my analysis demonstrated that consumption habits were very different depending on department. More importantly, I found no difference in the response distribution with regard to the frequency of news consumption within those disaggregated groups.

¹⁵⁰ In the pooled sample, the difference between response distributions was also highly significant for television news consumption (MSM median = 3, English median = 3, $p < 0.01$) and for frequency of political discussion (MSM median = 2, English median = 2, $p < 0.05$). η^2 calculations show that about 2% of the variance in television consumption and about 1.3% of the variance in frequency of political discussion can be attributed to a difference in language.

Last, because I suspected that language proficiency may have exerted additional influence on memory, I conducted a second analysis, comparing the MSM-language respondents from the first sample to an additional English-language respondent sample with a lower average proficiency rating in English. This sample also consisted of students attending the university but from different departments, and their assignment to language groups had also been randomized. My analysis found that there was a statistically significant difference between the response distributions of television news consumption and frequency of political discussion, though the effect size was relatively small.

However, the difference in television news consumption is likely not due to differences in recall. Had differences in recall been due to the language specificity effect, the response distribution of the English-language respondents would have mimicked that of the MSM-language respondents in shape, likely shifted to the right with more responses in the least frequent consumption categories. However, the response distribution of the English-language respondents instead formed a distinctly different shape than did the MSM-language respondents. This pattern, combined with my previous analysis of the consumption patterns within the original sample, leads me to suspect that the differences are likely due to systematically different news consumption patterns by departments rather than due to true difference in recall. With regard to news consumption, I most likely cannot reject the null hypothesis, that my population of MSM-English bilinguals does not exhibit the language specificity effect.

With regard to frequency of political discussion, the conclusions are more uncertain. Though not statistically significant, more English-language respondents also selected the "Often" category in both my original analysis and the disaggregated departmental analysis. This consistent difference in self-reports leads me to suspect that I can likely reject H_0 in favor of

confirming H₂, that some confounding factor is indeed distorting how my participants reported political discussion. I cite social desirability bias and systematic differences in interpretation, either due to vocabulary issues or to formulating different criteria for what constitutes political discussion, as potential explanations. However, this dataset is not capable of adjudicating between them.

Conclusion

To the best of my knowledge, this is the first experiment that uses real world reporting instruments, those of natural language survey questions on self-reported behavior, to study episodic recall. Moreover, it was likely among the first experiments to examine whether monocultural bilinguals can exhibit the language specificity effect. Though the results suggest that monocultural bilinguals likely do not exhibit memory effects, I believe that my experiment highlighted pertinent issues that should be pursued in future studies.

First, future experiments that use samples of university students may not be able to sufficiently randomize away underlying influences. In one infamous experiment, Marwell and Ames (1981) studied whether different groups of participants exhibited similar behavior when faced with a large-scale collective behavior dilemma, and they found that only graduate students in Economics in fact behaved with accordance to economic rationality. Knowing what was the expected behavioral standard, in that situation, changed how the participants behaved in real life. In this case, the departmental academic requirements may very well have imposed very different patterns of media consumption upon my respondents that distorted my results.¹⁵¹

¹⁵¹ This may also be a reflection of conducting experiments, including survey experiments, in universities abroad. The liberal arts education is a rarity outside of the United States. Undergraduates in the People's Republic of China, for example, are required to apply to a specific major within a university. Their course of study is focused upon competency in the subject, and students have very few opportunities to take electives outside of their major.

Second, though my experiment did not uncover language specificity effects, this result forms a baseline for future experiments to build upon. Due to government regulations and stringent censorship, both online and offline, the media environment in People's Republic of China is relatively insular and monolingual. This allowed me to control for content, as almost all of the news content that the respondents will have been exposed to is likely to be in MSM. In turn, I was able to test whether language by itself exerts sufficient influence on recall and found that it did not.

My results also suggest that the language specificity effect may be evoked by language in conjunction with some associated underlying factor, such as affect. Previous experiments ask participants to elaborate on the earliest or the first memories to come to mind when given a prompt. Just as listeners may not be able to keep from thinking about elephants when a speaker specifically ask them not to think about elephants, recall may work similarly by activating the most accessible memories in reaction to a stimuli, such as a prompt. For bilinguals, using a particular language likely makes the knowledge and experiences formed in that language more accessible, especially if some experiences are strongly associated with a particular language (and/or culture) and are particularly memorable, *i.e.* affect-laden. In contrast, they may exhibit no language specificity effect with a prompt, such as recalling the frequency of one's news consumption for the past week, which is associated with relatively unexciting experiences.

Finally, my experiment was one of the first to use natural language prompts to probe for memory effects. By moving past the single-word prompts that psychology experiments so often use, I was able to test for the presence of the language specificity effect in a more naturalistic setting, and more specifically, using instruments that Political Scientists commonly rely on to collect data. Though my experiment found no effect in monocultural bilinguals in a

predominantly monolingual information environment, I recommend that future studies examine memory effects in the context of more diverse linguistic environments, in which bilinguals may have access to more information and experiences than is offered in the dominant language. Though natural language prompts may be subject to additional influences that controlled interviews and lab experiments are able to disregard, these also give us a more realistic understanding of how the choice of language affects our data collection efforts. There is the possibility that natural language questions, particularly on mundane subjects such as frequency of voting or media consumption, do not provoke differences in recall. However, it is just as important to map out the exceptions as it is to point out where memory effects may truly hold sway.

Chapter 4: Cultural Frame Shifting

吾能漢語，然絕口不道於部人，懼其效漢而怯弱也。

I can use the Han language, but I refuse to speak it with my tribesmen, fearing that they would emulate the Han and become timid and weak.

Abaoji (872-926), founder of the Liao Dynasty

Dewaele and Pavlenko's 2001-2003 survey on bilingualism asked respondents¹⁵²

whether they ever felt like different people when speaking different languages.¹⁵³

Astoundingly, about two-thirds responded in the affirmative¹⁵⁴, and many elaborated on their answers, giving such explanations as:

Yes of course. I feel much more sophisticated when I speak English probably because I learnt from sophisticated people in a private college in York some time ago. When I speak Dutch I feel like a more precise person. I learned to use it in a very precise and accurate way and for example never o mix up one word with another.

Yes I do. Sometimes I feel like being two different persons or just a person with two incomplete languages. The worst moments are when I feel like not having a language identity.

(Pavlenko 2006, 12, 25)

Psychoanalysts have developed treatment plans based on the affective gap between languages, prompting patients to discuss and process traumatic experiences in L2 when a similar discussion in L1 could have overwhelmed them (Arragno and Schlachet 1996, Claus 1998). In the creative realm, the choice of language for a bilingual writer may determine whether she achieves her creative vision. Irishman Samuel Beckett (1906-1989), who won the 1969 Nobel Prize in Literature, chose to write in French as it enabled him to express

¹⁵² The questionnaire was advertised online, so the 1,039 respondents were a “convenience sample,” not demographically representative of any general population, or of any bilingual population.

¹⁵³ The open-ended question text was (in English only): "Do you feel like a different person sometimes when you use your different languages?"

¹⁵⁴ 675 participants (65%) replied in the affirmative, 266 (26%) replied in the negative, 64 (6%) replied ambiguously, and 34 (3%) either provided an irrelevant answer or left it blank (Pavlenko 2006, 10).

himself "without style".¹⁵⁵ Jhumpa Lahiri, who wrote several English-language bestsellers including *The Interpreter of Maladies*, wrote her 2016 memoir in Italian, commenting that:

I think I am less afraid in Italian, perhaps because I have this sense of being masked, and it all seems kind of unreal, in a way, when I express myself in Italian, because of the way I came to the language, the way I acquired it so painfully, in a way, word-for-word, but also with a great deal of joy and satisfaction, and that sense of choice and freedom driving my learning of the language from the very beginning.¹⁵⁶

While the idea that bilinguals can feel like different people when speaking different languages is not new, academia across multiple disciplines has been slow to recognize that this feeling of difference merits serious consideration. Though psychological studies conducted as far back as the 1960s have found that bilinguals exhibited significant differences in verbal behavior depending on the language that they were speaking (Ervin 1964, Ervin-Tripp 1967, Koven 1998), sustained research into the topic was intermittent until the 1990s. Theoretical explanations into the relationship between bilingualism and behavior also fractured along discipline lines. Experimental psychology, as discussed in Chapter 2, has mostly directed its efforts toward investigating how languages prompt different affective and cognitive responses in bilinguals. In contrast, social psychology, cross-cultural psychology, and personality research have focused on bilingualism as an extension of biculturalism — defined as the state of having experienced and internalized two cultures (Nguyen and Benet-Martinez 2007).¹⁵⁷ Behavioral differences, in turn, are thus located in cultural variance, with language's role being indirect, or even spurious.

¹⁵⁵ Lichtig, Toby. 2015. "Why writing in English was a good career move for Nabokov, Conrad – and now Chirovici." *The Telegraph*, December 10, 2015. <http://www.telegraph.co.uk/books/what-to-read/why-writing-in-english-was-a-good-career-move-for-nabokov-conrad/>

¹⁵⁶ Chotiner, Isaac. 2016. "A conversation with Jhumpa Lahiri." *Slate*, February 17, 2016. http://www.slate.com/articles/arts/interrogation/2016/02/a_conversation_with_jhumpa_lahiri_author_of_in_other_worlds.html

¹⁵⁷ Grosjean (2015) offers a more expansive definition: "Firstly, they take part, to varying degrees, in the life of two or more cultures. Secondly, they adapt, at least in part, their attitudes, behaviours, values, languages, *etc.*, to these cultures. Thirdly, they combine and blend aspects of the cultures involved" (575)

In the biculturalist view, switching languages "activates" different cultures within a bilingual bicultural individual as the result of Cultural Frame Shifting (CFS) (Hong, Chiu, and Kung 1997¹⁵⁸). Bicultural bilinguals are likely to have learned their languages in very different cultural contexts and thus to associate words in each language with the relevant culture's "beliefs, values, [and] norms of a specific social group" (Resnick 1991, as cited in Brumbaugh 2002, 259).¹⁵⁹ Speaking a particular language primes the accessibility of cultural symbols that the speaker had previously internalized (Ross, Xun, and Wilson 2002). "Essentially, culture provides formulaic ways, much like a script, to express thoughts and feelings" (Veltkamp *et al.* 2012, 497). Bilingualism is only a symptom of biculturalism in this paradigm, with language itself exerts no independent influence.

Numerous studies have confirmed that bilinguals respond differently in systematic ways on experiments measuring how switching languages changes one's recall (Marian and Kaushanskaya 2004), endorsement of cultural values (Bond and Yang 1982), self-perception (Trafimow *et al.* 1997; Ross *et al.* 2002), and even self-reported personality traits on personality batteries such as the California Psychological Inventory (Hull 1990, Hull 1996) and the Big Five Inventory (Ramirez-Esparza *et al.* 2006). Sister disciplines employing these batteries may not factor in the language of the survey or the multilingual profile of respondents when extrapolating from survey data.

However, the reliance on culture as the driver of attitudinal and behavioral change is problematic. First, though extant research has mainly been conducted at the mega-regional level, usually by pitting "Eastern" against "Western" cultures with the corresponding

¹⁵⁸ This name is inconsistently applied. Hong *et al.* (2000), which included many of the same authors as the 1997 publication, refers to CFS merely as frame switching.

¹⁵⁹ Citing Resnick, Brumbaugh's definition is actually divided into the cognitive aspect, defined above, and the social aspect, which is defined as "the group of people that shares and perpetuates this knowledge" (259).

languages, the underlying logic assumes that there exists some (easily) mapped list of correspondence between languages and cultures. However, sociolinguistic realities would seem very likely to be more complicated, as language may prime finer distinctions such as national differences, which may override similarities that exist at the regional-level for a culture.

Second, assuming that language acts only as a proxy for culture ignores the large number of bilinguals who are monocultural, that is, bilinguals who attained proficiency in L2 (or LX) while in their home cultures. To date, the only study to have devoted any space to the possibility that monocultural bilinguals experience CFS is Luna, Ringberg, and Peracchio (2008), a consumer research study that examined whether monocultural bilinguals evaluated self-sufficiency differently across Spanish and English. While they found that language had no effect on the attitudes of monocultural bilinguals, a lone study cannot be taken as being conclusive, especially in light of works and experiments showing otherwise as discussed in Chapter 2.¹⁶⁰ Generally, variance in the degree of multi-culturalism in multi-lingual individuals should be useful for adjudicating between theories that posit a role for culture and those that do not, to the extent that the key variables can be validly measured.

This chapter explores whether monocultural bilinguals may have access to different sets of values, depending on the language being used, and whether differential access may manifest in how they express attitudes and formulate judgments. Much work in political science posits that core values, including political values¹⁶¹, "reflect abstract, prescriptive

¹⁶⁰ Moreover, given that theories seem to have developed in isolation within various branches of psychology, the likelihood that

¹⁶¹ "Basic personal values serve as standards for judging *all* kinds of behavior, events and people", and they are "more abstract and fundamental than core political values" (Schwartz, Caprara, Vecchione 2010, 422). Moreover, Schwartz *et al.* argue that core values influence political behavior by first influencing the person's core political values (423).

beliefs about humanity, society, and public affairs" (Goren 2005, 882). Examples of core values include sets of normative beliefs that define "family values" and moral tolerance. These general and abstract values are usually said to "develop early in the adult life cycle" and to be "reinforced subsequently by the broader political culture" such that they persist over time in the minds of individuals and lie beyond the influence of short term political forces" (883). As core beliefs and values are thought to structure political attitudes and preferences (Feldman 1988), the prospect that "bedrock predispositions" may change as a function of the working language brings up the possibility that a bilingual may, for instance, vote very differently depending on the language used to appeal to him in electioneering or even the language in which a ballot is printed.

The first section reviews the current state of the bilingualism and biculturalism literature in social psychology, cross-cultural psychology, and personality research. The next reports results from two experiments. The first experiment tests for language-of-use differences among monocultural MSM-English bilinguals providing responses on the Traditionalism battery, originally developed by Andrew Nathan (2003) for the East AsianBarometer to measure political culture. Elements of the Traditionalism battery, such as an individual's deference towards authority and orientation towards collectivism, have often been explained as the reason for the incompatibility between Confucianism and western-style democracy (Pye 1988¹⁶², Weber 1951; see sources cited by Gong and Jang 1998 in a rather skeptical review).

The second experiment replicates the democratic aspirations module, also administered by the AsianBarometer, exploring whether bilingual respondents in the aggregate form different judgments about the current state of democracy in their country as a

¹⁶² Though see rebuttal by Fukuyama (1995) and Dalton and Ong (2005).

function of the language condition. In the democratization literature, similar batteries on support for democracy are commonly used as a predictor of the possibility that a country is ready to democratize, or in democratic countries, the likelihood or degree of democratic consolidation (Foa and Mounk 2016, Inglehart 2003, Welzel 2007).

Culture as script

While psychotherapists since Freud (1856-1939) had documented behavioral changes in their bilingual patients when they discussed their trauma in different languages (as cited in Pavlenko 2012), serious academic research into the connection between language and behavior began in the 1960s with Susan Ervin's studies on bilingual verbal behavior (1964a, as Ervin-Tripp, 1964b). She confirmed observations from prior clinical studies, using French-English (1964a) and Japanese-English bilinguals (1964b). In both studies, bilinguals focused on different themes and behaved very differently when responding to the same question in different languages¹⁶³. For example, The Japanese-English bilingual provided self-descriptions that emphasized autonomy and individualism when speaking English but answers that were group-oriented and more conciliatory when speaking Japanese. French-English bilinguals displayed similar thematic divergences in their responses. Similar observations have been made in a number of studies, with interviewers often opining that the same person sounded like two very different people (Koven 1998).

Ervin's studies were observational and did not attempt to isolate causal factors. She proposed a number of candidate explanations that fit the available data, including:

¹⁶³ Ervin (1964) asked French-English bilinguals to take the Thematic Apperception Test (TAT), which prompted participants to a story based on a series of pictures that were shown to them. Ervin-Tripp (1964) asked Japanese-English bilinguals to respond to the TAT in addition to materials such as "word associations, sentence completions, semantic differentials, [and] problem stories" (95).

1. Interviewer effect: participants interpreted the interviewer's switch in language as a prompt to tell a story that was applicable to that language;
2. Sapir-Whorf hypothesis : Switching language affected the participant's ability to classify stimuli and to recall experiences;
3. Media consumption: Differences that appear in the thematic frequency of the responses when participants switch languages reflects a similar thematic difference in the content of a particular language or cultural media;
4. Cultural differences: Differences in the themes and the behaviors expressed by the participant reflected "pervasive differences in the verbal preoccupations and values expressed verbally in the two cultures" (Ervin 1964, 505);
5. Code switching due to different domains of competence in different languages: Shifts in language signaled a shift in social context, to which participants reacted by giving different responses due to the different roles and emotional attitudes that they occupied in each context.

Aside from the obvious outlier in the Sapir-Whorf hypothesis¹⁶⁴, most of the explanations in the list above characterize language as a signal that cues a person about the characteristics of his audience, and in turn, the person exhibits some set of attitudes and behaviors that conform to expectations of that audience. Changing the language changes the signal, and the person responds by changing his behavior to match what is judged to be appropriate in context.

Unlike experimental psychology, which has embraced explanations rooted in differences in affect and cognition as discussed in Chapter 2, cross-cultural psychology and social psychology continued in Ervin-Tripp's footsteps to rely on cultural factors as explanation for why changing the working language caused a corresponding change in behavior. Culture, defined as "beliefs, values, [and] norms of a specific social group" (Resnick 1991, as cited in Brumbaugh 2002, 259), holds particular power for its members, as it "provides formulaic ways, much like a script, to express thoughts and feelings" (Veltkamp *et al.* 2012, 497). This script, which resides in the brain as part of a coherent mental construct called a meaning system, can be learned through repeat exposure, and it is often acquired at the same time as a person learns the

¹⁶⁴ Ervin-Tripp summarizes the Sapir-Whorf hypothesis as a language having the capability of imposing filters on how one perceives and processes the world. It's unclear whether these filters are irremovable (the "strong" version of the Sapir-Whorf hypothesis, which is actually a corrupted summary as formulated by Brown and Lennenberg 1954) or are simply easily accessible heuristics, which is closer to the original formulation proposed by Sapir and Whorf.

language associated with that culture. In short, language acquisition becomes attitudinal or behavioral acquisition.

Studies about bilingualism, then, are really studies about biculturalism, which Nguyen and Benet-Martinez (2007) define as being the phenomenon in which a person can simultaneously hold and move between two or more cultural meaning systems (103). Bicultural individuals, who maintain distinctly separate meaning systems for each culture¹⁶⁵, can shift between them to access their respective values and norms via a process called Cultural Frame Switching (CFS).¹⁶⁶ In other words, biculturals can access different cultural scripts in order to think and behave very differently.

Hong *et al.* (2000) adopted the logic of priming research in their proposed causal mechanism. First, they conceived of human knowledge as varying in accessibility (Higgins 1996; Wyer and Srull 1986); second, they assumed that more recently activated knowledge is more likely influence subsequent reactions to a stimulus (Hong *et al.* 2000, 711); and finally, they proposed that activation can spillover from one construct to other associated constructs (711). For culture meaning systems, which they conceptualized not as tightly integrated mental constructs but as "loose network[s] of domain-specific knowledge structures" (710), this meant

¹⁶⁵ Biculturalism is an alternative to integrating cultural meaning systems or supplanting one system with another. It is important here to note that biculturalism is only one possible outcome in the process of acculturation. According to Berry (1997), for a person moving between two cultures, acculturation is a bi-dimensional model with four different outcomes. An individual can be differently motivated or allowed to identify and participate with both a home culture as well as the new culture.

¹⁶⁶ Framing can refer to a variety of related but still distinct concepts across sociology, psychology, economics, and other disciplines. In political science, framing can be used to refer to frames in communication, which describes the way in which someone presents information, or frames in thought, which describes how an individual may perceive a situation (Klar, Robison, Druckman 2013). The recent attempts to repeal the Affordable Healthcare Act (ACA), for example, diverged wildly depending on whether one was listening to a Democrat or a Republican discussing the story. Republican messaging portrays their efforts to repeal the ACA by emphasizing the reduction of costs and government interference in the lives of citizens, while the Democrat messaging highlights the lives saved and the contribution to the public good when defending the ACA. Cultural Frame Switching as the term is used in cross-cultural and social psychology is conceptually similar to frames in thought. For a bicultural bilingual, the salience of one cultural meaning system over another in memory may shape the lens through which he perceives and make judgments about a situation.

that that activation of a concept associated with a specific culture, such as a value or a symbol, will make a bicultural person more likely to recall associated concepts from that culture. Consequently, because that culture will have been in his mind more recently and will remain relatively easy to recall for a period of time, its beliefs and norms will be more likely to guide his ideas and actions than beliefs and norms of other cultures that he has internalized.¹⁶⁷ Most importantly, as with other priming studies, the power of association suggests that Cultural Frame Switching is not always a deliberate process.

Follow-up experiments, which primarily primed via cultural icons, also established that there were limits to the effects of Cultural Frame Switching. Benet-Martinez *et al.* (2002) found that how biculturals perceived the compatibility of their cultural identities affected their response to different cultural primes. Biculturals who perceived their identities to be compatible exhibited the behavior expected with CFS, such as Asians becoming more collectively-oriented, while biculturals who perceived their identities to be oppositional often respond with affective reactance, or "engaging in behavior more consistent with the other culture" (496). In addition, Briley and Wyer (2002) and Hong *et al.* (2003) reported that people were more susceptible to CFS when the salience of group identity was highlighted. When group identity was made salient, Briley and Wyer's respondents minimized the risk of negative outcomes to themselves and others, such as by compromise or by allocating resources more equally, while Hong *et al.*'s respondents created very different causal narratives.

¹⁶⁷ Discussions in social psychology can be misleading when discussing bicultural behavior. Often, the language can be interpreted both to mean that observed behavioral or attitudinal discrepancies result from internalized values that are deeply *felt* or the result of internalized scripts that a bicultural follows despite not feeling differently (*e.g.* metaphorical code-switching). For example, describing oneself in collectivist terms rather than individualist terms could easily be a conscious decision made in concession to cultural expectations that talking about one's own qualities is vulgar. Though the fMRI studies and Stroop effect research discussed in Chapter 2 do not address *how* bilinguals feel when reacting to stimuli in L1 versus in L2, and though the target bilingual populations are relatively different (biculturals are usually simultaneous or childhood bilinguals, while studies in Chapter 2 are largely conducted on late bilinguals), these studies do demonstrate that differences in behavior are backed by very different magnitudes of emotion between the L1 condition and the L2 condition.

The relationship between language and CFS was established by Ross *et al.* (2002), who suggested that language can become a part of a culture-specific knowledge network if language acquisition occurs in an immersive context. Analogous to Pavlenko's assertion (2006) in Chapter 2, Ross *et al.* asserts that cultural values and beliefs can be acquired simultaneously with vocabulary and syntax.¹⁶⁸ Using the language will function similarly to being exposed to a cultural icon in activating the associated network of cultural knowledge. In addition, Kimmelmeier and Cheng (2004) report that women exhibited higher levels of CFS, presumably due to their higher sensitivity to social cues as well as relatively higher verbal ability (706).

The effects of CFS are extensive and affect both attitudes and behavior.¹⁶⁹ Kimmelmeier and Cheng as well as Marian and Kaushanskaya (2004) found that Chinese-English respondents were more likely to describe themselves on independent terms when responding to an English-language prompt and more likely to be on interdependent terms when responding to a Chinese-language prompt.¹⁷⁰ Similarly, Verkuyten and Pouliasi (2006) report that Greek-Dutch bilinguals living in the Netherlands evaluated their personal selves less positively and endorsed the importance of family integrity and friendship more strongly when responding to a Greek-language questionnaire as opposed to a Dutch-language questionnaire.

While the body of literature following Hong *et al.*'s articulation of a causal framework is relatively small, its predecessors that came after Ervin-Tripp did adopt similar, though less-clearly stated, assumptions and experimental designs. For example, Triandis and Trafimow's work on private versus collective self-cognitions (Trafimow *et al.* 1997, Trafimow, Triandis, and

¹⁶⁸ No literature has yet addressed whether there exists obstacles, such as age that may diminish this phenomenon.

¹⁶⁹ Though Hong *et al.* and Ross *et al.*'s framework remains the earliest as well as the only attempt at articulating a causal framework, most papers after Ervin-Tripp's work adopted similar (though less-clearly stated) assumptions.

¹⁷⁰ The biggest difference in these bilingual self-construal experiments seems to be whether to use an open-ended interview design or a closed-ended questionnaire design. Marian and Kaushanskaya, along with Triandis's and Trafimow's works in the 1990s, tend to favor an open-ended design, while Kimmelmeier and Cheng favored a standardized scale as an instrument.

Goto 1991, Ybarra and Trafimow 1998) were probably the most similar, but their focus was on whether a person maintained one unified or two distinctly separate constructs for his conception of the private self (cognitions about individual characteristics) versus that of his collective self (cognitions about group membership). Using language as primes, Trafimow *et al.*'s (1997) found that Chinese-English bilinguals in the English (L2) language control group gave responses that were on average 72% idiocentric and 23% group-centric, while those same bilinguals in the Chinese (L1) language control group gave responses that were on average 55% idiocentric and 38% group-centric.¹⁷¹ Similarly, Bond and his collaborators studied cultural accommodation in Hong Kong, which anticipates Benet-Martinez *et al.*'s work on affective reactance, reported that Chinese-English bilinguals of Chinese descent reported very different judgments of other ethnicities and very different approval levels toward cultural values, depending on the language of the experiment (Bond 1983, Bond 1985, Bond and Cheung 1983, Bond and Yang 1982, Yang and Bond 1980).¹⁷²

Culture as script for personality?

Personality research has been the longest as well as the most contentious area under study with regard to its susceptibility to cultural influences. While personality traits are thought to be heritable and also largely stable across a person's lifetime (*e.g.*, Gerber *et al.* 2011), researchers who have administered bilingual studies have reported contradictory results on a variety of

¹⁷¹ The responses were judged by coders as being idiocentric, group-centric, or allocentric, which referred to a quality of "interdependence, friendship, responsive to others, and sensitivity to the viewpoints of others" (Trafimow *et al.* 1997, 113).

¹⁷² Bond and his colleagues' work identified cultural values as having either a 'Chinese' or a English/'Western' orientation. Usually, the researchers classified values that emphasized the collective and deference to one's superiors were as being Chinese and values that emphasized the individual as being English/Western. However, his experiments only tested Chinese-English bilinguals of Chinese descent who lived in Hong Kong. This was probably due to convenience, as Bond and his colleagues are located at the Chinese University of Hong Kong, where the student and therefore available experimental population is almost all of Chinese descent.

personality instruments. In addition, they have attributed varying degrees of importance to the variance in the results.

The series was inaugurated by Ervin's study on the verbal behavior of French-Americans¹⁷³ (1964), one of the earliest examples of academic research on the topic. She evaluated their responses on the Thematic Apperception Test (TAT), which functions as a personality assessment as "people reveal something of their own personality (*i.e.*, their motivational and emotional condition), as well as their cognitive structure, when ascribing thoughts and feelings to ambiguously drawn characters" (Stricker and Somary 2001, 12183). In short, when responding to an ambiguous prompt, the style and substance of the person's reply give observers clues about the type of person that he is. As discussed earlier in this chapter, Ervin found that changing the session language affected the thematic content¹⁷⁴ that French-Americans produced. In one example, the same picture elicited "a variety of themes of aggression and striving for autonomy" in French, while weeks later, the same picture elicited a story in which "the heroine supports the husband in his achievement strivings" in English (504). As summarized earlier, Ervin was unable to isolate the cause for the difference in content, but concluded that bilinguals seemed to have two personalities, "at least to the extent that personality involves verbal behavior and perhaps further" (506). She also anticipated developments in social psychology by questioning "whether the differences found in bilinguals are merely a special case of biculturalism, or whether the fact that language is a medium not only for social behavior but for internal storage of information and self-control implies that bilinguals have a means of

¹⁷³ This experiment used a within-subjects design and conducted one session entirely in French and another entirely in English with a six-week interval between sessions. The researchers recruited 64 adult French persons, all immigrants, with an average age of 38. Two-thirds of the subjects were female.

¹⁷⁴ Ervin coded the content on the following dimensions: Achievement, Recognition, Dominance, Withdrawal and autonomy, Verbal aggression, Physical aggression, Guilt, and Escaping Blame

insulating sets of alternate behavior more pervasive than mere contrasts in behavior for different social situations or audiences." (506).

While Ervin urged further study into this topic, the next major inquiry into this topic wasn't until Philip Hull's¹⁷⁵ 1990 dissertation¹⁷⁶, which studied whether bilingual responses differed on the California Personality Inventory (CPI)¹⁷⁷. His within-group, between-language analysis¹⁷⁸ found significant differences between his subjects' L1- and L2-language responses¹⁷⁹, and that these differences were systematic between different cultural groups. This led Hull to conclude that bilinguals likely had access to "two autonomous stores of learned information, each store being associated with one of a bilingual's two languages" (119) and that "for bilinguals, linguistic context predicts personality differences associated with the culture in which a given language was acquired." (119) However, he was unable to adjudicate between whether the language-induced differences due to the "culture affiliation hypothesis", in which "subjects tend to affiliate themselves with the values and beliefs of the culture that is associated with the language in which they are currently operating" (67, similar to Yang and Bond 1980), or the

¹⁷⁵ Philip Hull was Ervin-Tripp's student.

¹⁷⁶ A condensed summary and extension of his dissertation research can be found in Hull (1996).

¹⁷⁷ The California Personality Inventory is a self-administered paper-and-pen personality test. Respondents are asked whether they agree or disagree with 480 statements broken down into the following 18 dimensions: Dominance, Capacity for status, Sociability, Social Presence, Self Acceptance, Well-Being, Responsibility, Socialization, Self-Control, Tolerance, Good Impression, Communality, Achievement via Conformance, Achievement via Independence, Intellectual Efficiency, Psychological Mindedness, Flexibility, and Femininity. Femininity seemed to have been dropped on all reports in the dissertation. However, as Hull himself noted, the CPI lacked sufficient factorial basis, though "no other measure of personality for normal populations has been so thoroughly validated with external criteria" (76).

¹⁷⁸ Subjects were Chinese-English (N=57), Mexican Spanish-English (N=74), Korean-English (N=17) college students at UC-Berkeley. All respondents were immigrants to the United States who began to learn English through immersion after eight years of age, making them late childhood or late bilinguals. The study was a within-subjects repeated measures experiment, with the subjects taking the CPI in both L1 and L2 with 5 to 15 days between sessions. Respondents also had two days in which to return their self-assessments.

¹⁷⁹ Using the Wilcoxon Matched-Pairs Signed-Ranks Test, Hull found that Mexican-Americans showed significant differences ($p < 0.05$) on nine of the 18 scales (Capacity for Status, Social Presence, Self Acceptance, Responsibility, Good Impression, Communality, Achievement via Conformance, Achievement via Independence, and Intellectual Efficiency); Chinese-Americans showed significant differences ($p < 0.05$) on six scales (Dominance, Social Presence, Socialization, Good Impression, Communality, and Achievement via Conformance); Korean-Americans showed significant differences ($p < 0.05$) on only two scales (Good Impression and Achievement via Conformance).

"minority group-affiliation hypothesis", in which respondents will "self-identify as members of an ethnic minority group and/or adopt the behavioral stereotypes of the majority culture about their minority as their own when they are operating in the language associated with their minority group" (67). In short, while Hull was able to conclude that bilinguals did report different personality data depending on the language, he could not determine the interaction between culture and language that led to these differences. He closed by urging a greater awareness of the influence of language on human behavior.

The explosion in personality research in political behavior has centered around McCrae's Big Five Personality Inventory (McCrae and John 1992, McCrae and Costa 1997), where it has been used to demonstrate that Democrats and Republicans were associated with distinctly different personality traits (Mondak and Halperin 2008), and that personality affected civic engagement (Mondak *et al.* 2010), including the propensity to protest (Opp and Brandstätter 2010). As the Big Five Inventory became more widely used in the 1980s and 1990s, administering the inventory to bilingual speakers briefly gained popularity as the original researchers sought to show that Big Five traits were universally applicable and to demonstrate the validity of Inventory across cultures and languages. Studies involving three bilingual speaker populations, such as Spanish-English bilinguals¹⁸⁰ (Costa, McCrae, and Kay 1995), Korean-English bilinguals¹⁸¹ (Piedmont and Chae 1997), and Chinese-English bilinguals¹⁸² (McCrae *et al.* 1998) all reported unexpectedly small cross-lingual correlations for some facets or traits. Piedmont and Chae (1997) reported a relatively low cross-lingual correlation for

¹⁸⁰ Subjects were 74 bilingual Hispanic undergraduates. They took the Inventory in two different languages at the same sitting.

¹⁸¹ Subjects were 58 Korean-American bilingual speakers out of a 116 enrolled in a 2x2 language x personality inventory study (English-English, Korean-Korean, Korean-English). Subjects had an average of 7 days between taking the two versions of the assessment.

¹⁸² Subjects were 162 Chinese-English bilingual undergraduates living in Hong Kong. They were also enrolled in a 2 x language x personality inventory study, with 81 assigned to the cross-lingual group, first taking the inventory in one language, and then the other.

Conscientiousness, which ranged between 0.64 to 0.68. Similarly, McCrae *et al.* (1998), reported that the cross-lingual correlation for Openness was 0.86, but Values, which was one of its facets, only had a cross-lingual correlation of 0.46. However, these studies were conducted primarily for the purpose of validation, not with the goal of evaluating the behavior of bilinguals. Thus, these low correlation values were attributed to factors such as the language fluency of the respondent (McCrae *et al.*), the quality of the translation (McCrae *et al.*), or the trait being inappropriate for the target cultural setting. Whether language could potentially have affected responses was not addressed.

Almost a decade later, Ramirez-Esparza *et al.* (2006) reexamined bilingual responses on the Big Five Inventory to disentangle whether differences were due to Cultural Frame Switching or to other causes. After examining responses from Spanish-English bilinguals living in the United States and Mexico¹⁸³, they reported that the respondents as a group tended to score higher in Extraversion, Agreeableness, and Conscientiousness on the English-language test than on the Spanish-language test. Analysis of variance found that these differences in means across languages were significant.¹⁸⁴ Most interestingly, their group analysis found that "individuals tend to retain their rank ordering within a group but the group as a whole shifts" (115). In other words, an extraverted bilingual in their participant pool does not suddenly become introverted when he switches languages. While the authors proposed several alternate explanations, such as such as L1 invoking their childhood personality while L2 invoking an adult personality (115), all of their alternate explanations involve some interaction between personality and culture that is

¹⁸³ The subject pool consisted of 227 Spanish-English bilinguals living in the United States and 22 Spanish-English bilinguals living in Mexico. Of this sample, 25 visited the lab on two separate occasions, spaced a week apart, to complete two linguistic forms of the Big Five Inventory (BFI); 54 completed the BFI on the phone, with a week separating the two phone sessions; last, 170 subjects were interviewed via phone and then were invited to visit the lab to complete both the Spanish and English forms of the BFI in one session.

¹⁸⁴ Extraversion effect size: 0.25 ($p < 0.05$); Agreeableness effect size: 0.44 ($p < 0.001$); Conscientiousness effect size: 0.51 ($p < 0.001$)/

then primed by language. Along similar lines, Veltkamp *et al.* (2012) administered the NEO-Five Factor Personality Inventory (Costa and McCrae 1989, Costa and McCrae 1992) on German-Spanish late bilinguals¹⁸⁵. They found that responses in Spanish were generally lower in Agreeability and Neuroticism but higher in Extraversion. While Ramirez-Esparza *et al.* treated their finding predominantly as confirmation of Ross *et al.* that language can indeed prime CFS, Veltkamp *et al.* goes further to assert that CFS can be observed even in late bilinguals who "might no longer have sufficient personality 'plasticity' to benefit from second-language learning as a means to provide them with a new culturally framed and language-modulated personality" (498). In other words, they asserted that bilinguals who learned L2 later in life, after their personalities have stabilized during adolescence, can also exhibit CFS.

Finally, Chen and Bond (2010) deployed the Big Five Personality Inventory as well as a specialized regional personality inventory, the Sino-American Person Perception Scale (SAPPS)¹⁸⁶. Their study administered both inventories to Chinese-English bilinguals in Hong Kong¹⁸⁷ as a cross check. On the Big Five Personality Inventory, respondents were asked to score a typical native Cantonese speaker, a native English speaker, and then to respond for themselves. They found that respondents who took the Inventory in Chinese responded with

¹⁸⁵ The respondents were 68 bilinguals living in Germany. Respondents were between 20 and 38 years of age, with 26 of them being male. There were 40 German L1 speakers and 28 Spanish L1 speakers. The German L1 speakers were slightly younger (mean age = 26.20 years, SD = 3.09 years) than the Spanish L1 speakers (mean age = 28.36 years, SD = 4.27 years) (499). The respondents were randomly assigned to take the personality inventory in a language. After participating in a distractor task involving an EEG study, respondents were then asked to complete the Inventory in the other language.

¹⁸⁶ SAPPS is based on the Western Five Factor Model (Normal 1963), which seems to be a predecessor to McCrae and Costa's Big Five Personality Traits, as well as "indigenous Chinese adjective checklists" (Lew 1985, Yang and Bond 1990, as cited in Chen and Bond 2010, 1520). SAPPS "captures socially relevant traits and has been well validated as a comprehensive measure of personality perception with Chinese populations" (1520) and consists of eight dimensions: four of the five elements from the Big Five battery (Openness, Conscientiousness, Extraversion, Agreeableness) and four specific to this index (Application, Helpfulness, Restraint, and Intellect, though Restraint could be a relabeled version of Big Five's Neuroticism).

¹⁸⁷ The participant pool was a group of female Chinese-English bilinguals of Chinese descent (N=76). They were students at the Chinese University of Hong Kong with a mean age of 20.34 (SD = 1.49) (1519). Half were randomly assigned to complete the written assessment in English and half in Chinese. After two to three weeks, the participants were then asked to complete the assessment again in the other language.

traits closer to that of their envisioned Chinese-speaking individual, while those who took the Inventory in English responded with trait closer to that of their envisioned English-speaking person. However, when the researchers repeated the experiment with SAPPS¹⁸⁸, they found that differences that were a function of the working language were much milder when compared to the differences that social interaction with a representative from a particular ethnicity or culture was able to evoke.

These studies have been largely exploratory, as the causal mechanism that link personality, language, and culture are less clear. In one explanation, Cultural Frame Switching is the culprit, as bicultural bilinguals who acquired languages in their respective cultural environments will have acquired different cultural scripts that govern their behavior, which may include how they react to the same question on a personality assessment. Alternately, CFS may shift how biculturals perceive and judge themselves, leading them to rate themselves according to the culturally appropriate standards of behavior in the working language. In other words, though their behavior may not have changed, the standards by which they evaluated their behaviors did. Last, acculturation, or the process of adapting to the new environment may wreak changes upon the bilingual's personality and behavior, especially if his social roles changed after displacement (McCrae *et al.* 1998). The bilingual's age during the period of transition determine the magnitude of change, as his L1 may reflect a snapshot of his mental development up to that age, and his L2 may then reflect how he mentally adapted to the move. Though Chen and Bond endorsed the acculturation explanation, no other works seem to have sought to clarify the causal mechanism.

¹⁸⁸ Respondents took the SAPPs in both languages with several weeks in between testing sessions. This was followed by interview sessions with interviewers of different ethnicities speaking English or Cantonese.

Unpacking the influence of biculturalism

While Cultural Frame Switching is an elegant theoretical narrative, the experimental reality is somewhat less than ideal. Basic assumptions, such as a clear definition for culture and the values associated with a culture, are implicitly assumed and often discussed in stereotype. Moreover, when a cultural value is defined, it is often cast in relative terms as the opposite of whatever the other culture under study holds. For example, Chinese or "Eastern" culture is often pitted against some semblance of "Western" culture, with Chinese culture being defined in family- or collective-oriented terms. However, there is no one homogenous set of "Western" values, and countries that are traditionally considered to be "Western" may vary in their endorsement of the family unit or the collective, as was shown by Verkuyten and Pouliasi (2006).

Second, while *Ethnologue* reports that there are currently 7099 spoken languages in the world today (Simons and Fennig 2017), there is no current estimate on the extant number of cultures. There is currently no consideration for situations in which a language may span several cultures, or where multiple languages may be associated with the same culture. Chinese, for example, may cue respondents residing in mainland China, Taiwan, Singapore, and the United States very differently, as can English on countries that were formerly British colonies.

More problematic is the assumption that only bicultural bilinguals, defined earlier in the chapter as people who can simultaneously hold and move between two or more cultural meaning systems, as being capable of exhibiting CFS. However, biculturalism is only one of possible outcomes of acculturation¹⁸⁹ and not the inevitable end state. Other outcomes can include

¹⁸⁹ Berry (1997) defined the possible end states as being Integration, Assimilation, Separation, and Marginalization. The two intersecting criteria are 1) whether it is considered valuable to maintain one's identity and characteristics (*e.g.* culture) and 2) whether it is considered valuable to maintain relationships with the dominant culture in the society to which they have moved (10). Berry considered biculturalism to be analogous to Integration (11).

individuals who are fluently bilingual but never adopt the values of their second language, or bilinguals who have wholeheartedly tried to supplant their mother culture with the culture of their second language.

Experimental studies have not imposed stringent criteria when selecting for bicultural respondents. Aside from Luna *et al.* (2008)¹⁹⁰ and Verkuyten and Pouliasi (2006)¹⁹¹, which were the only studies to have collected data on the bilingual's cultural values or cultural affinity, most studies seem to have taken bilingualism itself as sufficient proof of biculturalism. For instance, Ross *et al.* recruited Chinese-born university students in Canada on the basis of their place of birth, how long they had lived outside of Canada, their ethnicity, and their language skills (1043). Most troubling is Hong *et al.*'s reliance on previous claims of Hong Kong students' biculturalism, using Bond (1993) to claim that they were "acculturated with Western social beliefs and values" and thus qualified as bicultural candidates (as cited in Hong *et al.* 2000, 713). However, this assumption seems to have been based on a flawed reading of Bond's work. Bond does describes the myriad different cultures that young people in Hong Kong *can* be exposed to, but his experiment asked respondents only to rate their perception of the character of different ethnic groups and then to rate themselves. Self-perception of biculturalism does not necessarily mean the presence of true biculturalism.

By not adhering to the original requirement for biculturalism, the studies have inadvertently shown that most bilinguals can probably exhibit Cultural Frame Switching.

Respondents who have exhibited CFS have ranged from first-generation immigrants (Benet-

¹⁹⁰ Luna *et al.* administered Mendoza's Cultural Life Style Inventory (CLSI; 1989), which asked ten questions on the respondent's affinity toward Anglo or Hispanic culture. Each response required a numerical response on a scale of between one to five; a score of three was assumed to indicate the presence of biculturalism, and scores of one or five to indicate mostly monoculturalism (Luna *et al.*, 287).

¹⁹¹ Verkuyten and Pouliasi asked their Greek-Dutch respondents to rate the extent to which they felt Dutch or Greek. However, "feeling" Greek, Dutch, or some combination of the two does not mean that the individual actually holds both sets of values.

Martinez *et al.* 2002), to bilinguals who have lived in their L2 environment for an average of more than 20 years (Verkuyten and Pouliasi), to immigrants who have been immersed in both of their language environments since birth (Hong *et al.* 2000, 2003). However, regardless of whether these bilinguals are bicultural, all of them have had sufficient exposure to the cultures associated with their respective languages.

Can monocultural bilinguals exhibit Cultural Frame Switching? Though Luna *et al.* (2008), the single publication that deliberately recruited for monocultural bilinguals for their experiment, reported that their subjects did not seem to exhibit CFS when asked to respond to a word categorization task, this experiment was relatively small¹⁹² and its results have not yet been replicated. Multiple factors, however, may increase the likelihood that monocultural bilinguals are capable of exhibiting CFS. First, though language acquisition may largely occur in a classroom setting, the method and content of instruction may teach the student to associate different values or norms of behavior with the language itself (Yang and Bond 1980). For example, English may be taught from textbooks that promote democratic values. Second, increased linguistic proficiency also facilitates the consumption of media from the target culture, thereby providing an indirect conduit through which values and language become intertwined. English-as-a-Second-Language (ESL) learners, for example, are often encouraged to watch movies and television shows¹⁹³ in order to learn colloquialisms and to become acclimated with an L2 at conversational speed, that is, much faster than is spoken in a classroom setting. The content of these shows, especially if they were produced in the L2 country, will reflect the values and norms of that country. Last, depending on the topic, switching into L2 may affect the

¹⁹² The respondents were 93 Spanish-English bilingual females. They were distributed into a 2 (language: Spanish, English) x 3 (sociolinguistic group: monocultural Anglo, bicultural, monocultural Hispanic) experimental design. Evenly split, this means that there were probably only 30 respondents per cultural category.

¹⁹³ An sample ESL/EFL syllabus: <http://larryferlazzo.edublogs.org/2008/04/26/the-best-popular-moviestv-shows-for-eslefl/>

salience of the speaker's group identity (Briley and Wyer 2002, Hong *et al.* 2003), which in turn may affect how the bilingual interpret events or make decisions that may potentially affect their social group.

Culture, politics, and the individual

Comparative politics has long studied the effect of culture on politics at the aggregate level. Works such as Almond and Verba's five-country study on civic culture (1963) and Inglehart's cross-national project on the transition from materialist to post-modern values (1997) have sought to explain how characteristics of national cultures prevent or facilitate democratization. Lucian Pye (1985) famously claimed that Asian countries have embraced paternalistic forms of power in order to satisfy a deep-seated need for security.

By contrast, how culture affects individual behavior, and the political implications of that influence, is virtually unstudied. Political science experiments routinely recruit respondents with relatively little consideration as to their respective cultural background. However, a new experiment by Clist and Vershoor (2017) report that bilingual respondents in Uganda contributed 30% more in the public goods game when the working language was Luganda, the national language, as opposed to Lugisu, belonging to the local culture that values self-reliance but not reciprocity or cooperation.¹⁹⁴

In survey research, cross-national analyses are regularly conducted by students and experienced researchers, but concerns of compatibility are largely directed at ensuring accuracy of translation and of measurement.¹⁹⁵ Culture, through language, can shape the answers that the respondents give to an accurate instrument. Kuroda, Hayashi, and Suzuki (1986), for example,

¹⁹⁴ Clist and Vershoor's respondents are childhood bilinguals with high proficiency in both languages, who likely had similar levels of affect associated with both languages. They stated that the only difference was in the cultural values associated with Lugisu.

¹⁹⁵ Cross-cultural survey guidelines at the University of Michigan: <http://ccsg.isr.umich.edu/>

reported that Japanese-English and English-Japanese bilinguals were more likely to be equivocal and select a middle position response when taking a survey in Japanese than in English, regardless of ethnicity. While outside of political science, Lechuga and Wiebe (2009) found that Mexican-American respondents were more likely to state their intent to use condoms when surveyed in English as opposed to Spanish.

Though awareness of the connection between language, culture, and behavior is growing in political science, the current state of research is still immature. Lee (2001) and Lee and Pérez (2014) analyzed responses on the 1989-1990 Latino National Politics Survey and the 2006 Latino Household Survey, both providing the option of responding in English or in Spanish, found that English-language respondents and Spanish-language respondents gave drastically different answers on questions pertaining to trust in government officials, to immigration policy, and to language policy. Though response differences persisted even after controlling for demographic differences, respondents self-selected into different language conditions, and the authors proposed that the identity of the interviewer may have also affected responses.¹⁹⁶ Pérez and Tavits's recent work attribute policy attitude differences displayed by bilinguals between Estonian and Russian to linguistic differences between the two languages. For example, they assert that attitudes toward gender equality were a function of whether the language featured gendered or genderless nouns (Boroditsky, Schmidt, and Phillips 2003). However, those same policy attitude differences could plausibly be explained by cultural differences between Estonian and Russian (or post-Soviet attitudes).¹⁹⁷

¹⁹⁶ Lee and Pérez also proposed that differences were due to the working language, which "may impose an interpretive lens through which the entire survey interaction is defined, much like a framing experiment" (420). However, their interpretation is that the difference emanates from the difference in interpretation (*i.e.* words used to define a concept) and not as a function of cultural framing.

¹⁹⁷ Boroditsky's works on gendered and genderless languages (with Schmidt and Phillips 2003, Phillips and Boroditsky 2003) as well as time perception (2001) have been widely discussed in both academia as well as the news. However, they have also come under intense criticism for logical fallacies as well as a failure to replicate the

The works discussed in this chapter have demonstrated that the choice of language can affect opinion and behavior. Incorporating this insight into political science research will likely have great theoretical, methodological, as well as practical implications. Personality traits, for example, have been shown to correlate with political participation (Gerber *et al.* 2011, Mondak *et al.* 2010) as well as party preference (Vercchione *et al.* 2011), but these findings may require adjustment given that fluctuations in personality traits as reported by bilinguals may not be stable. While psychologists expect self-reported personality traits to fluctuate slightly if a respondent took an assessment repeatedly within a short period of time, those results should be relatively consistent over a longer period of time. However, if the same personality trait can differ in measurement during the same testing session when the working language is changed, or if that difference in a trait changes over a longer period of time between languages, then the importance given to the overall stability of personality traits may merit reconsideration. Similarly, policy preferences could similarly be affected by the language used to discuss the issue. Using a language associated with a more parochial culture can conceivably affect whether a speaker supports a woman's right to choose. Attitudes on immigration controls (Lee and Pérez 2014) may vary depending on whether the language used activated the group identities under discussion. Finally, a language associated with more authoritarian or conservative societies, for example, may activate considerations of higher opportunity costs than a language associated with more democratic and egalitarian societies, thereby potentially changing whether a person decides to vote or to contact a politician.

results. The time perception experiment, for example, has been rebutted by two different sets of authors, in which Chen (2004) reported four failures at replication, and January and Kako (2007) reported six more.

Monocultural bilinguals and language in political science

Both core values and perceived compatibility of one's country with democratic institutions are attitudes deemed to be essential for democratization. The two experiments presented in this chapter explore whether positions on those attitudes deemed to be essential for democratization remain stable in monocultural bilinguals in the aggregate when they are tested in different language. The first experiment examines whether monocultural bilingual responses on the Traditionalism battery, originally developed by Andrew Nathan (2003) for the East AsianBarometer to measure political culture, differed as a function of the language condition. Elements of this battery, such as an individual's deference towards authority and orientation towards collectivism, have often been cited as cultural for the incompatibility between Confucianism and western-style democracy (*e.g.* Pye 1988). The second experiment replicates the democratic aspirations survey module that is administered by the AsianBarometer and the World Values Survey, exploring whether bilingual respondents form different judgments in the aggregate about the current state of democracy in their country as a function of the language condition. In the democratization literature, answers from this module are commonly used as a predictor of the possibility that a country may democratize, or in democratic countries, the likelihood or degree of democratic consolidation (Foa and Mounk 2016, Inglehart 2003).

Participants in these experiments were monocultural Chinese-English bilinguals. Monocultural bilinguals were targeted for methodological as well as theoretical reasons. First, the majority of research conducted thus far has focused recruitment on bilinguals who spoke targeted language pairs at a high proficiency level. For experiments conducted in the west, this often carries the risk of recruiting participants who do not necessarily share the same linguistic

acquisition or cultural background, even when they speak the same languages. As an example, Verkuyten and Pouliasi (2006) recruited 211 Greek-Dutch respondents who had lived in the Netherlands for at least five years. Their ages ranged from 18 to 70, with an average age of 38.2 (standard deviation was 17.2 years); the mean length of residency in the Netherlands was 27.3 years, with a standard deviation of 13.3 years. They did not investigate their respondents' place of birth or their language acquisition backgrounds.

By contrast, university students in China constitute a relatively homogenous population of monocultural bilinguals for experimental purposes. The central government has heavily promoted, and in many cases, required that communications be conducted in Modern Standard Mandarin (MSM) in order to promote a common sense of identity.¹⁹⁸ Legal directives encourage compliance in mass media and in education.¹⁹⁹ Thus, most young children grow up speaking a regional variant of MSM, or are effectively bilingual in both MSM and their regional topolect. Children are generally introduced to English in primary school²⁰⁰, and that education continues throughout their education. Students applying to domestic universities must take an English-language exam as part of their application process, and they must demonstrate sufficient proficiency²⁰¹ on the College English Test (CET) in order to graduate from university. The participants in my experimental population were educated entirely in China. In addition, while they have been exposed to English-language media, the majority of them have never traveled outside of the country. Given their similar backgrounds, studies conducted on this population

¹⁹⁸ Sonmez, Felicia. 2014. "China is forcing its biggest Cantonese-speaking region to speak Mandarin." *Business Insider*, August 25, 2014. <http://www.businessinsider.com/china-is-forcing-its-biggest-cantonese-speaking-region-to-speak-mandarin-2014-8>

¹⁹⁹ Jinzhang, Chunyu. 2010. "Calls to purify the Chinese language are misguided." *China.org.cn*, May 4, 2010. http://www.china.org.cn/opinion/2010-05/04/content_19965972.htm

²⁰⁰ Many parents also enroll their children in early English courses or allow them to watch English-language media.

²⁰¹ In general, undergraduates must pass Grade 4 on the CET, while specialized majors that use English heavily, such as English majors or Tourism majors, must pass Grade 6.

should be able to control for confounding influences that may have been overlooked by previous experiments.

Second, this experiment is one of less than a handful of studies to study monocultural bilinguals, and so far, it is the only one to study the potential impact of language and culture on existing data collection efforts in political science. Cross-national surveys, like the World Values Survey, are usually administered in a single language or a small subset of the common languages in any country due to logistical as well as political considerations.²⁰² However, if the choice of working language greatly affects how these attitudes are reported, then the fluctuations would suggest that the data that underpin long-held conclusions in the democratization literature may be even less reliable than previously assumed.

What do Chinese values look like?

The Asian Value Thesis argues that the political values of East Asia²⁰³ are inherently incompatible with the values needed to support democracy (see Welzel 2011 for overview of desired values). Former Singaporean Prime Minister Lee Kuan Yew were among its most ardent supporters, arguing that historical circumstances resulted in values that are "paternalistic, accept hierarchic authority, and are community-oriented", which in turn resulted in societies that required non-democratic governments in order to truly flourish.

What, then, do these values look like? Much of the discourse casts Asian, also called "eastern", values as the opposite of western, liberal values, such as being less individualistic or

²⁰² As an example, the World Values Survey in the People's Republic of China does not interview citizens in the provinces of Xinjiang and Tibet. The local polling organization reports that they do not have a sufficient number of interviewers proficient in the local languages, though given regular coverage of civil unrest within these regions, it is plausible that the lack of coverage is politically expedient as well.

²⁰³ East Asia here refers more specifically to Northeast Asia, whose members include the People's Republic of China, Taiwan, Japan, and both Koreas. In this case, proponents of the Asian Values Thesis may be extending the definition to include those countries in which Confucian values hold sway, either by adoption (*e.g.* imperial Korea or Japan) or through human migration (*e.g.* Singapore).

more collective-oriented, but a better way of understanding Asian values is to put them in perspective of Confucian philosophy, from which they originate. The traditional virtues on that list include "harmony, benevolence, righteousness, courtesy, wisdom, honesty, loyalty, and filial piety" (Zhang 2013). Kim (2010) characterize these virtues in practice as valuing the importance of the family and other collective units in all aspects of life, endorsing the subordination of individual interests to those of the group; deferring to the power and wisdom of authority figures, prioritizing social order, preferring rule by consensus rather than by naked competition and contention, and last, emphasizing self-discipline and hard work (320-322).

In the early era of People's Republic of China, Confucian values were excoriated as a vestige of feudal superstition. However, Bell (2010) argues that drastic attempts to root out Confucian values never succeeded, and that these values continued to govern everyday life, most notably with regard to family ethics (10). Confucian values then gained ascendance after the Cultural Revolution and in the wake of *perestroika* and the dissolution of the Soviet Union, as the Party turned back to study how they had helped to stabilize other East Asian countries (Osno 2014). Today, the regime has once again made Confucianism mainstream, possibly in an attempt to "promote a sense of social responsibility amidst the recent rise of individualism and economic competition" (Shi 2009). More importantly, the adoption of Confucian values helps to shape the standards by which citizens evaluate good governance.

Experiment 1: Traditionalism

Values are abstract conceptions about desirable end-states and behaviors, and they are generally applicable to different contexts (Rokeach 1973). They develop early in the adult lifecycle and are subsequently reinforced by the surrounding political culture (Feldman 1988), remaining relatively stable over time, largely insulated from the effects of short-term political

events (Goren 2005). For many, "policy attitudes and beliefs are not simply accepted on the basis of their packaging by elites, but in a general way are consistent with certain core beliefs and values" (Feldman, 417). Though values, often referred to as core values or core political values, do not determine political preferences, they are one of many possible criteria with which a person can use to evaluate policies, to guide their judgment of administrative performance, and to determine how they vote (Goren 882).

In comparative politics, aggregated values have been used to characterize different political cultures in order to explain their respective compatibility with democratization. Ronald Inglehart's World Values Survey, for example, has tracked the transition from materialist to postmodern values²⁰⁴ in countries since 1981. For Inglehart and Welzel (2010), economic development "enhances people's abilities and motivation to demand democracy" (561). While self-expression values may not bring about democratization, they do "have a strong impact on *changing* levels of democracy" (561).

Do bilinguals profess similar values when they are interviewed in different languages? Given that monocultural bilinguals learned their second language in the same culture as their home language, we should expect that both languages are associated with the same cultural context and thereby the same network of cultural knowledge in memory. Thus, when asked about their values, they should answer similarly, leading to my null hypothesis.

H_{A0}: There is no difference in the core values in the aggregate as reported by respondents in English or in MSM.

However, social psychology and cross-psychology suggests that monocultural bilinguals may be able to associate a second language with a different network of cultural knowledge, even though the content of that knowledge may have been acquired indirectly. For example, Yang and

²⁰⁴ Also known as survival values and self-expression values, respectively.

Bond (1980) suggest that English learners may learn attitudes, values, and expectations through curriculum materials or through observation of their teacher's behavior (412). The prevalence of western entertainment in Asia, especially English-language media, give bilinguals many opportunities to absorb expectations about the west. Alternately, MSM may be associated with Chinese cultural knowledge while English may not have strong associations with any system. In that scenario, I suggest that using English will force the respondent to utilize cognitive processing (as discussed in Chapter 2) in order to evaluate his personal values.

H_{A1}: A difference in the core values in the aggregate can be observed between the English-language and MSM-language responses.

Because Asian values, specifically Confucian values as discussed above, are oriented toward a more paternalistic, collectivist, and hierarchical worldview, we should anticipate that MSM-language responses are oriented similarly. In other words, if English-language and MSM-language responses due to being associated with different cultural expectations, then MSM-language responses in the aggregate should endorse harmony and hierarchy more than English-language responses will.

H_{A2}: MSM-language responses will endorse Confucian values (*e.g.* harmony and hierarchy in the aggregate) more than English-language responses.

Last, Kimmelmeier and Cheng (2004) observed that female respondents exhibit higher levels of Cultural Frame Switching due to their greater sensitivity to language and to social cues. Thus, we should anticipate that the difference between aggregated MSM responses and aggregate English responses by female respondents will be greater than the difference found in aggregated responses by male respondents.

H_{A3}: Aggregated responses by female participants between language conditions will differ more than responses by male participants.

Language populations may also behave differently in how they select responses. Following Kuroda, Hayashi, and Suzuki (1986), I suggest that CFS may cause English-language respondents to feel less constrained about using the full range of choices than MSM-language respondents.

H_{A4}: MSM-language responses will be more compressed in range than the English-language responses.

Operationalizing Confucian values

I measure respondent endorsement of Confucian values through their responses to questions from the Traditionalism Battery that was originally found on the Wave 1 Questionnaire of the AsianBarometer.²⁰⁵ Originally developed by Andrew Nathan for the East AsianBarometer (2003), he defined traditionalism as:

"a culturally transmitted set of attitudes, which changes at differential rates in response to different forces of social change, and which intervenes between social and institutional change on the one hand and support for democracy on the other, in such a way as to affect the impact of the former on the latter." (1)

Nathan conceives of tradition as "a set of attitudes that were characteristic of all societies at a certain stage in their history prior to modernization" (2) and sees it existing on the same attitudinal spectrum as Ronald Inglehart's (1997) Modernization-Postmodernization scale.

Based on Lau and Kuan's work on traditional Chinese social order (1988), Nathan's Traditionalism battery was developed specifically for the Sinosphere, and it focuses explicitly on politically-relevant Confucian values such as group primacy and deference to authority.

²⁰⁵ Various versions of the Traditionalism battery exist. The complete set of questions from which I have borrowed my module appeared in the Wave 2 questionnaire of the AsianBarometer. The battery was modified, with some questions deleted and other questions inserted, for Waves 3 and 4.

Each question presents a scenario in which an individual is in conflict with another party, such as an authority party or a larger collective. The respondents are asked to mark whether they agree with the stance taken in the scenario via a 4-point Likert scale (1 being "Strongly agree" and 4 being "Strongly disagree").²⁰⁶ The first five questions (items A-E) involve conflicts with authority figures or with groups in society, as listed below:

- A. Even if parents' demands are unreasonable, children should still do what they ask.
- B. Being a student, one should not question the authority of their teacher.
- C. When one has a conflict with a neighbor, the best way to deal with it is to yield to the other person.
- D. For the sake of the family, the individual should put his personal interests second.
- E. Sometimes one has to follow one's own beliefs regardless of what other people think.

The last two (items F-G) present conflicts in an explicitly political setting²⁰⁷:

- F. Open conflicts among politicians are harmful to society.
- G. People should always support the decisions of their government even if they disagree with them.

I compared the pertinent questions on the English-language questionnaire to the simplified Chinese version for errors²⁰⁸, and then I translated the Chinese versions back into English to ensure consistency. One English-language question on conflict between neighbors (item C) was then simplified for comprehension in accordance with feedback received during my pilot study, in the process also bringing the meaning closer to the MSM-language

²⁰⁶ The 4-point Likert scale intentionally omits a neutral option. Several respondents tried to force a neutral option by checking boxes for both "Agree" and "Disagree". These responses were coded as non-answers during coding.

²⁰⁷ Nathan's original Traditionalism battery contained eight mandatory questions and eight optional questions. Interestingly, the number of questions on the English questionnaire and the MSM questionnaire differed wildly, with nine on the English version (eight mandatory, one optional), and 24 on the MSM version (all mandatory). I used the questions from the English questionnaire and eliminated the ones that were not immediately pertinent to university-age students, such as about coworkers and about in-laws. Luckily, he also notes that the choice of questionnaire items likely matter very little due to their inter-correlation, any combination of questions should perform comparably (footnote 17).

²⁰⁸ Wave 1 of the AsianBarometer was conducted by the Institute of Sociology of Chinese Social Science Academy. Though no translator was named, the questionnaire was most likely translated by the Institute as well.

version.²⁰⁹ Before analysis, all of the scales were aligned for consistency such that 1 indicated more support for traditional attitudes and 4 indicated more support for individualist attitudes. Item E was the only item to require recoding. From a survey design point of view, it is mildly unfortunate that the wording was not more balanced, such that agreement would have reflected individual or collective stances about equally often. I opted to replicate the AsianBarometer items rather than to alter them. A possible implication of this choice is that any tendency to prefer agreement (or, somewhat less plausibly, disagreement) independent of content will appear as a spurious collectivism (individualism). Since my interests lie primarily in comparing across the language used, and not focusing on levels as such, this is not a terrible flaw for present purposes.

There is obviously a mismatch between the purpose of the experiment, examining the stability of core attitudes in the aggregate across languages, and its operationalization, which involves examining the stability of aggregated reactions to conflict scenarios across languages. Core values are difficult to measure directly, and researchers usually must administer a battery of attitudinal questions in order to indirectly measure the underlying values (Ramsay 2001). Nathan (2007) asserted that most of the items in the Traditionalism battery load onto two core value, that of seeking harmony and avoiding conflict and reflecting collective interests while submerging individual interests. I conducted factor analysis on the pooled data and found that five of the seven attitudinal questions seem to load onto two factors with the pooled data (Table 4.1a). I further perform separate factor analyses on the MSM-language sample Table 4.1b) and

²⁰⁹ The wording was changed to reduce vocabulary difficulty and brought it closer in meaning to the MSM-language version. The changes are indicated in italics below:

Original wording: When one has a conflict with a neighbor, the best way to deal with it is *to accommodate* the other person.

Changed wording: When one has a conflict with a neighbor, the best way to deal with it is *to yield to* the other person.

the English-language sample (Table 4.1c). This time, six of the questions in both language samples loaded onto the two factors²¹⁰, though each language group exhibited different response-loading patterns.²¹¹

The respondent sample

Though a total of 465 respondents answered all seven items in the Traditionalism battery, I have limited the analysis to 429 participants who indicated that they had not had extensive international experience.²¹² Basic demographic information was available for 420 respondents, of which 86 were male and 338 were female. Their ages ranged from 17 to 27 years old, with mean age 20.2 years (std. dev. 1.5 years) and median age of respondents 20 years. Most respondents were between 19 and 21 years of age, with 20 years being the modal age of respondents. Aside from 18 graduate students, all others were undergraduates, with most respondents in their first three years of university. The language ability of those 429 respondents on a 10-point scale, with 1 being least competent and 10 being fluent, was the average MSM proficiency self-rating was 8.4 (std. dev was 1.4), while the average English proficiency self-rating was 7.0 (sd = 2.1). Of these respondents, 216 were randomly assigned to the MSM-language condition, and 204 were randomly assigned to the English-language condition.

²¹⁰ The only question that did not load onto either factor was E. Sometimes one has to follow one's own beliefs regardless of what other people think.

²¹¹ In all three analyses, Item E ("Sometimes one has to follow one's own beliefs regardless of what other people think.") did not load onto any factors.

²¹² I was able to ask the frequency with which these respondents have traveled abroad, and I eliminated those who reported traveling abroad at least once a year. This was done in order to insulate against respondents who may have experienced cultural immersion in a foreign country.

General results

Figures 4.1-4.7 show the relative frequency distributions to responses on all seven items. The response distributions were relatively similar overall, though the MSM-language responses seem to converge more sharply on a single sentiment per item (usually "Agree" or "Disagree" than did the English-language responses. For example, while both language groups converged upon the "Disagree" as the modal choice for items A and C, there was at least 10% difference between the proportion of English-language respondents and the proportion of MSM-language respondents who selected that sentiment. These respondents seem to endorse relatively individualistic attitudes when they were posed with conflicts with people they know, though overall, they still seem to endorse the primacy of the interests of the family unit over their own interests. Responses were more equivocal about potential conflicts in politics and in general. Though respondents in both language groups converged to a modal response, unlike responses on the previous group of questions, the total proportion never exceeded 60% on any of the items.

Though both groups preferred the more moderate options ("Agree" and "Disagree"), far more English-language respondents selected the more extreme sentiments ("Strongly Agree" and "Strongly Disagree") on almost all items. This is especially apparent on items A, B, C, and G, where about 10% more English-language respondents selected "Strongly Disagree" (about 19%) than did MSM-language respondents (about 9%).

I then conduct statistical analysis to examine whether the difference in any of the response distributions were statistically significant. Fisher's exact tests²¹³ on all of the response distributions (Table 4.2) show that the difference in response distributions for items A and G

²¹³ Fisher's exact test was used on several items due to low counts on some contingency squares, and though chi-square results are roughly comparable, I have decided to use it for all items for consistency.

were statistically significant. Because neither Fisher's exact test nor the Chi-square test-of-independence examines the ordering of response choices, I next use descriptive statistics to explore trends that may be present in the data.

If we assume that the ordered responses reflect attitudes that fall on an interval scale and that values can be regarded as equally distant (coding 1 for strong agreement, 2 for agreement, 3 for disagreement and 4 for strong disagreement), then average responses of MSM-language participants were slightly lower than those of English-language participants, indicating support for more traditionalist values (see Table 4.3). As was discovered earlier on the visual examination, MSM-language responses were more tightly clustered, which appears here as much smaller standard deviations on those items than on the English-language responses. However, the differences were relatively small, with the exceptions being item B (questioning the teacher's authority), item D (putting own interests below that of the family), item F (open conflict between politicians), and item G (support government decisions even if they personally disagree).

Though response differences do exist, they tend to be small and may not be indicative of true attitudinal differences. Table 4.4 shows both results for the independent-samples t-test and the Mann-Whitney's U Test. While their results tend to agree, I have noted their disagreements, most notably in item B. As suspected, the overall differences were not statistically significant, and even for item B, less than 1% of the total variance in responses that could be explained as a function of language.

Does gender matter?

Kemmelmeier and Cheng (2004) hypothesize that female respondents may be more sensitive to language and to cultural cues. I therefore disaggregate my samples by gender and

then reran the above analysis. The female sample had 338 respondents and the male sample had 90 respondents.²¹⁴ Average age of female respondents was 20.0 years (std. dev. 1.5 years); the self-reported proficiency in MSM was 8.4 (std. dev. 1.4) while the self-reported average proficiency in English was 7.0 (std. dev. 2.1). By contrast, the average age of male respondents was 20.8 years (std. dev. 1.6 years); the average self-reported proficiency in MSM was 8.4 (std. dev. 1.4), and the average self-reported proficiency in English was 6.9 (std. dev. 2.1). The respondents look relatively well-balanced, based on those characteristics.

Factor analysis by gender revealed some curious differences between pooled and disaggregated language data. In the pooled response sample for female respondents, five of the seven questions loaded onto two factors (Table 4.5a), and this pattern was repeated for the MSM-language sample (Table 2.5c, N=170). However, in the English-language sample (Table 4.5b, N=168), only four of the seven items loaded onto one factor. However, the situation changes for the sample of male respondents (N=90), for which all of items only loaded onto one factor. While five of the seven items loaded onto one factor for the pooled-responses (Table 4.6a) and for the English-language responses (Table 4.6c), six out of seven items (the additional item being item D) loaded onto one factor for the MSM-language responses (Table 4.6b). However, as mentioned previously, this may have been caused by sensitivity to low sample size rather than truly illustrative of response variation between languages.

On the whole, response patterns by gender mirrored that of the general analysis. MSM-language responses tended to prefer more neutral responses than did English-language responses in both genders. However, we do observe a difference *between* genders in the English-language condition, where male responses were far more likely to select responses that were more

²¹⁴ While the analysis on the male sample will likely have very low power, this number is in line or even higher than similar studies conducted in psychology.

individualist.²¹⁵ However, whether that was due to a true pattern or to small sample sizes is unknown. For male responses in the English-language condition, most of the response distributions were bell-shaped, resembling responses for the MSM-language condition and for female responses in both language conditions, there were three exceptions in items B, C, and G. For items B and H, the English-language responses for males were simply monotonically increasing. The modal response for item B was "Strongly Disagree", and 19% more English-language responses selected that option than did MSM-language respondents. That difference was even starker on item G, where the difference between English-language respondents selected "Strongly Disagree" and MSM-language respondents selecting the same was 24%. For item C, the responses seemed almost equally split between "Agree", "Disagree" or "Strongly Disagree", with the distribution being convex in shape. The difference in response distributions by language and gender was confirmed by Fisher's exact test (Table 4.7), which found that none of the female response distributions differences by language were statistically significant, but that the differences in distribution by language for items C and H for male respondents were highly significant ($p = 0.01$).

When descriptive statistics are calculated for the disaggregated samples, shown in Table 2.8a and 2.8b, I find that the differences on most items for the female respondents were minor at best. Again, the mean responses in the English-language condition were slightly more individualistic than in the MSM-language condition. The biggest differences were on items B (difference = 0.08), item D (0.12), and item G (0.08). That same pattern held for male respondents, with English-language respondents expressing attitudes that were slightly more individualistic than MSM-language respondents did. However, the differences between

²¹⁵ "Strongly Disagree" for all items except E, for which "Strongly Agree" indicated more individualist sentiments

languages were much more apparent, with average responses on items B (difference = 0.29), F (0.43), and G (0.34) exhibiting the largest differences between language groups.²¹⁶

However, as with the pooled responses, most of the response differences by language within gendered samples were not statistically significant. In the female respondent sample, only item D approached statistical significance ($p = 0.07$), but only 1% of the total response variation could be attributed to language. In the male respondent sample, differences in items B and G in approached statistical significance, at $p = 0.08$ and $p = 0.058$, respectively. The effect sizes were similarly small, at 3% for item B and 4% for item G of total response variation for male respondents attributable to language. Moreover, the sizes of the effects in the male respondent samples may be a function of smaller sample size than of true differences in response.

The results largely support the null hypothesis (H_{A0}), that no differences were observed between the mean responses of the MSM-language and English-language respondents. Moreover, my hypothesis (H_{A2}), that female respondents will display greater differences in sentiment than male respondents, was also contradicted by the results, which suggest that male respondents instead were more sensitive to the working language. However, low-sample size for the male respondent sample suggest that replication with a larger respondent sample will be needed for confirmation. Only H_{A4} , that MSM-language respondents will provide a more compressed range of responses than will English-language respondents, was confirmed on several response items by visual inspection as well as by statistical analysis.

²¹⁶ Though this was not part of my official analysis, a cross-gender comparison also showed distinct differences within language groups. Except on item G, men tended to express more traditionalist attitudes than did the women in the MSM-language condition, with the largest differences on items A (difference = 0.24), B (0.14), and F (0.27). There was no clear pattern in the English-language condition, with males expressing more traditionalist attitudes on items A (difference = 0.21), C, D, and E, while females expressed more traditionalist attitudes on items B, F (difference = 0.11), and G (0.31). However, independent-sample t-tests show that only items A in the MSM-language condition and item in the English-language condition approaching statistical significance, at $p = 0.066$ and $p = 0.054$, respectively.

Experiment 2: Language and support for democracy

Diffuse regime support is defined as the demonstration of "*stable and long-term commitments to the system*, which are independent of the actual performance of its component institutions" (Shin 2012, 7, emphasis in the original). In David Easton's conceptual framework on political legitimacy (1965)²¹⁷, diffuse regime support refers to the goodwill that citizens develop toward the institutions that underpin their regime. In other words, diffuse regime support is abstract and more enduring than the volatile, specific support that citizens give to their politicians and the policies of their government.

In the democratization literature, public support for democracy is considered to be a key factor for democratic consolidation (Bratton, Mattes, and Gyimah-Boadi 2003), and in democratizing regimes, a bulwark against a reversal back into authoritarianism (Nathan 2007). Though "overt support for democracy is a necessary but not sufficient condition for democratic institutions to emerge (Inglehart 2003, 52), the thinking goes that broad and enduring support for democracy makes citizens legitimize the regime and thus buffers its supporters, to some extent, against the chaos that regime transition can cause (Bratton *et al.* 2003).

An enduring puzzle in East Asia is the relatively high levels of support for democracy that have been expressed repeatedly by citizens of mainland China. Over 96% of respondents on the 2001 World Values Survey as administered in China responded that having a democratic system was fairly good to very good. Similarly, Wang (2007) found that when asked whether democracy was suitable in China, with 1 being completely unsuitable and 10 being perfectly suitable, over 96% of mainland Chinese respondents gave a response of 6 or above on the first

²¹⁷ Easton's framework included three objects of support, that of political community, political regime, and authorities for governing; and two modes of support, diffuse and specific.

wave of the AsianBarometer.²¹⁸ Shi and Lu (2010) reported that mainland Chinese respondents expressed the second highest level of expressed desire for democracy, after Thai respondents, on Wave 2 of the AsianBarometer.²¹⁹ However, those same respondents are also known for expressing the highest levels of satisfaction with their country's authoritarian regime (Shi 2001).

This experiment explores whether a respondent's attitudes about democracy differ as a function of the language used to probe those attitudes.

H_{B0} : There is no difference between the level of support for democracy expressed in MSM and the level of support for democracy expressed in English.

In the null hypothesis, a lack of difference on the aggregated responses suggest that both MSM and English are associated with the same network of cultural knowledge and thus the same view of democracy.

There are several plausible explanations in the CFS literature for why the level of support for democracy may differ. First, following Hong *et al.*, MSM and English are associated with different networks of cultural knowledge, and each network contains a different conception of democracy that guides response. As a variation on this explanation, if English is not strongly associated with any network of cultural network of knowledge but MSM is, then respondents may be guided by an cultural script when evaluating his support for democracy in MSM but be forced to use cognitive processing (as in Chapter 2) to objectively evaluate his support for democracy in English.

There are several competing explanations for how Chinese culture views democracy. Wang (2007), for example, suggest that while Chinese citizens approved of democratic

²¹⁸The AsianBarometer was known as the East Asian Barometer and began with an initial coverage of eight countries. As its coverage has expanded, its name was changed to reflect its more ambitious reach.

²¹⁹ By contrast, newly democratized countries like the Republic of Korea and Taiwan scored the lowest on the survey for perception of democracy being suited to their own countries (Shi and Lu 2010, 124).

institutions, they were also ambivalent about the potential chaos that democracy may bring and prioritized social and economic issues over political rights as current national priorities, which he interpreted to be as yet unready to accept democracy. In this view, respondents may view democracy negatively due to what they have observed happening around the world in democratic countries.

H_{B1}: MSM-language respondents will express less support for democracy than English-language respondents will.

Alternately, MSM-language respondents may be less willing to express support for democracy because their group identity had been made salient. Per Briley and Wyer (2002) and Hong *et al.* (2003), cueing group identity motivated respondents to minimize negative outcomes to their group, such as to create alternate causal narratives in order to cast a more positive light on the group. Expressing support for democracy may be interpreted as an implicit criticism on their own country, which respondents may wish to avoid.²²⁰ Practically, this should manifest as more critical evaluations of democracy and less desire for democracy in their own country.²²¹

In contrast, Shi and Lu (2010) suggest that Confucian philosophy has imposed a different understanding of democracy upon Chinese society. In contrast with the western conception of democracy, "defined as a set of institutional arrangements to reach decisions on public issues and to ensure good governance" by holding "open and competitive elections" (125), the Chinese conception of democracy is more a governing philosophy for the rulers. This paternalistic view, which Shi and Lu call *minben*, from the maxim *minwei bangben* (民惟邦本 people alone are the basis of the state), states that rulers must promote the welfare of their citizens in order to stay in

²²⁰ Though Kemmelmeier and Cheng (2004) suggest that females are more sensitive to social and linguistic cues, a gender analysis could not be conducted due to the size of the respondent sample.

²²¹ Another possible explanation may be that reading in Chinese may have also primed their group identity and/or cued the identity of the researcher, which may have made them more comfortable in professing more critical opinions.

power (126).²²² The AsianBarometer interviewed mainland Chinese respondents on their understanding of democracy and found that only 24.6% had a clear grasp of the procedural view, while 14% understood democracy in terms of *minben* and an additional 4.6% holding an understanding that was a combination between the procedural view and the *minben* view.²²³

H_{B2}: MSM-language respondents will express more support for democracy than English-language respondents will.

In this view, MSM-language respondents will express more support and demand for democracy because they believe that democracy is the philosophical ideal of how a government, including their own, should behave.

Similar to H_{A3}, Kuroda, Hayashi, and Suzuki (1986)'s findings suggest that MSM-language respondents should behave similarly to Japanese-language respondents in being conservative with their responses. In practical terms, this may manifest as the response distribution being clustered in the more moderate responses and being more truncated in range.

H_{B3}: MSM-language responses will be more compressed in range than the English-language responses.

Democratic supply and demand

To date, there is no consensus on how to capture diffuse regime support or, more specifically, support for democracy. I have opted to use Bratton *et al.*'s system (2005) in measuring democratic aspirations in individuals, which attempts to quantify the distance between a person's demand for democracy and what he perceives to be the supply of it from the current

²²² Wang (2007) suggests something similar, that because communist countries often had or have "Democratic Republic" in their names, their citizens may interpret a request to evaluate democracy in terms of their own government's performance (568).

²²³ Surprisingly, Taiwanese respondents did not do much better, with only 29.7% holding a procedural view on what democracy is and a further 1.8% holding an understanding that is a mix of the two. These are relatively low numbers, but completely in line with more recent research finding that understanding of democracy is not much greater for citizens of other Asian democracies such as the Republic of Korea, Indonesia, and Mongolia (Shin 2017).

regime. In this system, demand is measured by his perception of the suitability of democracy to his own country, while supply is measured by his assessment of how democratic the current regime is. The supply question was given first, and it reads as follows:

On the following scale, 1 stands for "not a democracy" and 10 stands for "complete democracy", and smaller scores represent less democratic and larger scores represent more democratic.

Where would you place our country under the present government?
 Not a Democracy 1 2 3 4 5 6 7 8 9 10 Complete democracy

It was followed by the two demand questions, text given below:

To what extent would you want our country to be democratic now?
 Democracy is completely unsuitable 1 2 3 4 5 6 7 8 9 10 Democracy is perfectly suitable.

Here is a similar scale of 1 to 10 measuring the extent to which people think democracy is suitable for our country. If 1 means democracy is completely unsuitable for PRC today and 10 means that it is completely suitable, where would you place our country today?

Democracy is completely unsuitable. 1 2 3 4 5 6 7 8 9 10 Democracy is perfectly suitable.

As in Study 1, I compared the question wording found on the Mandarin Chinese form of the AsianBarometer questionnaire to the English-language wording found on the core version. I back-translated the questions, both Chinese form to English as well as the English form to Chinese, to check for consistency. These questions were also pilot-tested locally for comprehension.

Due to the objection of several departments that had allowed their students to participate, these three questions were removed in a subsequent version of the survey, administered four days later. Thus, a total of 185 participants responded to this battery of questions. Of the 183

respondents who provided demographic information, 25 respondents were male, and 158 were female. Their ages ranged from 17 to 28 years, with an average age of 20.1 years (std. dev. = 1.9 years). There were 167 undergraduates and 16 graduates who responded to the survey.

The respondents were randomly assigned to a language, with 90 in the MSM-language condition and 98 in the English-language condition. On a 10-point scale, with 1 being least competent and 10 being fluent, the average MSM proficiency self-rating was 8.4 (std. dev. = 1.2), and the average English proficiency self-rating was 7.3 (std. dev. = 2.0). I have omitted a gender analysis due to the very small number of male respondents, though my analysis showed that female respondents exhibited the same response patterns as the pooled sample.²²⁴

General results

Figure 4.15 shows the relative frequency distribution for the first demand question (assessment of current regime as democratic). The MSM-language responses were more concentrated in the mid-range, between a score of three and seven. Most notably, no one answered 10 (completely democratic) to this question. The English-language responses, resembling responses in the first study, were much more variable. About the same concentration of respondents gave an answer between three and seven, but they seemed more likely to give odd-numbered answers, especially seven (with about 23% of the respondents). Over all, the response distribution of MSM-language respondents looks more symmetrical, while the response distribution of the English-language respondents skews left.

For the second demand question (desire for country to be democratic now), Figure 4.16 shows that both of the relative frequency distributions of the MSM-language responses and the English-language responses skew left, with similar modes at a score of eight (with approximately

²²⁴ This is logical, as they constituted at least 85.4% of the response sample. My analysis also showed that the male respondents were not outliers that could have exerted undue influence on the pooled results.

30% of respondents in both language conditions selecting this response). Again, while a similar number of respondents in each language group were clustered between a score of five and nine, English-language respondents were more willing to respond with scores at the extreme ends (one or ten). MSM-language respondents, by contrast, entirely avoided both scores.

This pattern of avoiding the extremes repeats in Figure 4.17, which asks for the respondent's assessment of the suitability of democracy to their country. There were no responses in the lowest score categories (one and two) for MSM-language responses. While the English-language responses were similarly left skewed, they were again more likely to utilize the more extremely options.

The average responses for the democratic demand questions (Table 4.11, entries two and three) were relatively similar, though the English-language responses were more dispersed than the MSM-language responses. The true exception here was the democratic supply question (same table, entry one), where both the medians and means between language conditions differed significantly. The median for English-language responses was 6, while the median for MSM-language responses was 5. The averaged means between language conditions had a difference of 0.68, though the dispersion of the responses seemed similar to the response patterns found on the other two questions. An independent-sample t-test revealed that the difference was statistically significant ($p < 0.03$), though only about 2% of the total variation in responses could be attributable to be language.

The results were mixed, overall. While MSM-language and English-language respondents were united on their aggregated demand for democracy, which is relatively high, they were divided on their perceptions of the current supply of democracy. The mean response of the English-language respondents was higher than that of the MSM-language respondents,

indicating that English-language respondents had a more favorable opinion on the degree to which their government was democratic, confirming H_{B1} . However, the data do not allow me to adjudicate whether this difference was due to MSM-language respondents being more critical of their own government (and being honest about it), to English-language respondents being less critical because the language of the survey primed their group identity, or a combination of both.²²⁵ Last, though a visual inspection suggested that the distribution of MSM-language responses was truncated as compared to the distribution of English-language responses (H_{B3}), Mann Whitney's U test found that only the difference in the response distributions for the supply of democracy question was statistically significant ($p = 0.036$).²²⁶

Discussion

Hong *et al.* (2000) suggested that Cultural Frame Switching can activate different systems of cultural knowledge for use by a bicultural bilingual. Because these cultural knowledge systems can include different norms, values, and prescribed ways of behavior, switching systems can also change people's opinions and behavior. Ross *et al.* (2002) then showed that language can trigger CFS. While the prevailing opinion is that only bicultural bilinguals can exhibit CFS, the research designs of these studies reveal that the expected shifts in behavior and knowledge are observed even though their own assumption of biculturalism, which has a strict definition in cross-cultural psychology, is regularly violated.

²²⁵ I could not adjudicate the third possibility, that English-language respondents engaged in cognitive processing, as this line of explanation produces ambiguous predictions. However, one possibility could be that these respondents are reminded of events happening around the world in democracies, which prompted them to view their own governments more favorably.

²²⁶ In contrast, Kolmogorov-Smirnov tests show that differences between response distributions were all statistically insignificant. However, this result was also accompanied by the caveat that it was unable to compute an exact p-value due to ties in the data.

My chapter extends that study to monocultural bilinguals, as anecdotal evidence suggests that they may be able to assemble a cultural knowledge system for the L2 through indirect experience, such as through foreign language teaching materials or through media. I study whether evidence of Cultural Frame Switching on core values in Experiment 1 and attitudes toward democracy in Experiment 2 can be detected in monocultural bilinguals.

Overall, the results were mixed. Experiment 1 found that respondents provided similar responses on an attitudinal battery designed to probe traditionalist attitudes such as deference toward authority, aversion to conflict, *etc.* Experiment 2 found that respondents were similar in their desire for their democracy, but that they were very different in their assessment of how democratic their current government was. Surprisingly, English-language respondents held more favorable views than MSM-language respondents. There is also some evidence that, per Kuroda *et al.* (1986), English-language respondents tended to take on more polarized attitudes than did MSM-language respondents in both experiments (Kuroda *et al.* 1986), though this was confirmed by statistical analysis on only isolated items in both Experiment 1 and Experiment 2. Finally, there is also some evidence to contradict Kemmelmeier and Cheng (2004), who suggested that female respondents exhibited greater differences in attitudes due to CFS than did male respondents. To the contrary, my analysis in Experiment 1 showed that male respondents in fact exhibited greater signs of difference in core values and also in how they chose their answers. However, as the sample size of male respondents was very small, this finding should be replicated for confirmation.

The findings in Study 1 suggest that monocultural bilinguals, at least these MSM-English bilinguals, do not exhibit CFS, by which I mean that they cannot draw upon another system of values or expectations when they are using L2 English. However, in light of the clear differences

found in the democratic supply question in Study 2 suggest otherwise, I argue that while L1 Mandarin Chinese may be strongly associated with a cultural knowledge system, L2 English may not be, and in the absence of readily accessible normative knowledge or other heuristics with which to make a judgment, the respondent must instead engage in cognitive processing to make a judgment (Geipel *et al.* 2015b). This additional consideration may help the respondent to reach different conclusions than the respondent would have with full access in L1, thus explaining the minor variations on some of the responses seen in both the core value items and on the democracy questions. Similarly, switching into English may have helped respondents to feel less averse when selecting a more polarized response option.

As with Chapter 2, these results are mediated by the format of this experiment. A paper survey with a long time limit means that, while respondents are not required to do so, they have the luxury of carefully considering their responses in both languages, or to return to previous items and change their answers.²²⁷ Conducting shorter experiment with the pressure of a time limit may observe additional response differences, or alternately, their disappearance. Moreover, Chen and Bond's observation (2010) that direct social contact elicited much bigger differences in behavior brings up the possibility that even monocultural bilinguals may behave very differently in interaction with a representative from the L2 culture, as they may try to respond by emphasizing qualities that they perceive their L2 culture to possess.

In the movie *Arrival* (2016), a mistaken translation by a rival country—coincidentally the PRC—brings the planet to the brink of war against aliens. The protagonist, Louise Banks, found that the translation had been the result of a differing expectations, one in which the rival translator had selected a more hostile interpretation because he assumed that they were in competition rather than in cooperation with the aliens. Similarly, the values and expectations

²²⁷ To my memory, I found very few instances of this as I coded the paper surveys.

inherent in a culture that a bilingual can acquire with a language can similarly color judgments they make about politics and how they decide to behave in a political context. A bilingual may be more inclined to support a politician advertising on a platform of family values in a language associated with more conservative social values than in a language that is not. Similarly, bilinguals from conflict-averse countries may judge the dangers of political participation very differently, depending on the language used for deliberation.

It bears repeating that the largely null results reported here are valid only for a single group of monocultural bilinguals, and then only for that language and culture pair. Whether bicultural bilinguals, or at least bilinguals who have had immersion experience in several cultures, in that same language and culture combination will profess different attitudes and judgments remains unstudied, though recent experimental findings from Clist and Verschoor (2017) suggest we should expect this to be the case. What is clear is that given the prevalence of bilinguals in the world today and the lack of scholarly attention given to them in political science thus far, the minor variations reported in this chapter should not be treated as a stopping point but as a baseline for what may be possible.

Chapter 5: Conclusion

This dissertation began by asking whether the acquisition of multiple languages also conveyed different modes of feeling and behaving upon a person. Because the possible combinations of languages and culture, like dyad-years in the Correlates of War dataset, are endless, I limit the scope of my analysis to the study of one group of monocultural bilinguals, or bilinguals who had acquired their L2 in a predominantly classroom environment, living in the People's Republic of China. My goal was to obtain a relatively clean baseline for the possible differences that may be observed when the only variation was in language.

To that end, I utilized the burgeoning bilingualism literature in psychology to explore the ways in which language may exert an effect upon its speaker; and to understand the possible impact of these findings upon political science, I designed and administered a survey experiment to assess the extent to which behavior may change when the working language was varied.

In Chapter 2, I attempted to replicate findings by Keysar *et al.* (2012), which had demonstrated that their respondent subjects, bilinguals who were largely monocultural, exhibited fewer cognitive biases and behaved more rationally due to increased cognitive processing when the experimental language was L2 instead of L1. My replication largely did not reproduce these effects. However, when I extended the study to decision-making on the Ultimatum Game, I did find that though players did not exhibit significant differences in behavior when the total monetary amount was large, L1 players rejected more bids than did L2 players when the total pot was relatively small. This suggests that L1 players may be more sensitive to the perception of being cheated when they perceive a commodity to be scarce. Given that one of the most important requirements of civil society is widespread acceptance of decisions that are unsatisfying, often over the distribution of scarce resources, the difference observed here carries

potential implications for multilingual societies, where a citizen using L1 may react very differently to unpopular legislation than will a citizen using L2. This was a particularly important finding as the differences in reaction were clearly observable despite using a long-form paper survey and using hypothetical money. I recommend that follow-up experiments, such as in interaction with other players also speaking other languages (Chen and Bond 2010) and/or with physical money (Raghubirand and Srivastava 2008), be conducted in order to observe whether language will have similar impact in a more realistic exchange.

In Chapter 3, I extend the recall research literature on the language specificity effect by Marian and her colleagues (Marian and Neisser 2000) to examine whether monocultural bilinguals, who consume the majority of their news information through a monolingual media, may exhibit differences in recall when they were prompted in different languages. My primary contribution here is methodological: I utilized a natural language instrument as opposed to the controlled experiments that had been previously conducted. My analysis found no difference in recall, suggesting that language is not the predominant driver of differential recall, or that any differences may not be observable on a standard instrument such as the survey. In addition, the nature of my convenience sampling showed that there were large differences in news consumption patterns between university students of different majors, providing additional evidence that conclusions drawn with college student samples may not be sufficient valid outside of that sample.

Finally, Chapter 4 investigates whether monocultural bilinguals may hold different core values or reach different judgments based on cultural knowledge system in use at the time, the activation of which can be triggered by language. Though the existing literature focuses on bicultural bilinguals, monocultural bilinguals may be capable of assembling a partial cultural

knowledge system through indirect contact with L2 culture. I measure whether respondents express differences in values such as deference to authority with AsianBarometer's Traditionalism Battery. To measure whether differential cultural knowledge may affect judgments, I use AsianBarometer's democratic aspirations battery, initially developed by Bratton, Mattes, and Gymah-Boadi (2005), to measure whether respondents perceive their own demand as well as the available supply of democracy very differently based on language. My results suggest that monocultural bilinguals do not exhibit CFS. However, their L2 may be less strongly associated with their L1's cultural knowledge system, forcing them to use cognitive processing instead. Previous research has found that cognitive processing reduces an individual's access to normative knowledge and other available heuristics with which he usually forms judgments. Thus, using L2 may result in potentially different assessments of a situation and also differences in how a response is selected.

Moving forward

The differences in decision-making and judgments that I have uncovered cannot determine whether monocultural bilinguals may not have a "second soul," but it does suggest that speaking a second language can confer special access to alternate ways of thinking. According to the available literature in psychology, that way may be influenced by culture, per Chapter 4, or influenced by increased objectivity through increased cognition, per Chapter 2. Alternately, the alternative may be some combination of mechanisms that have not yet been studied. In that light, the small number of differences that this dissertation has observed should not be treated as a stopping point, but as a floor on what we may possibly uncover if we expand our scope.

The current body of research is still small and still more focused on establishing baselines, and there is much that we do not yet know about bilingual cognition. For example, whether bilingual cognition in L1 resembles that of monolinguals is only beginning to receive attention in neuroscience. Moreover, bilingualism is a dynamic phenomenon, and we currently know very little on how changing proficiency and different acquisition experiences affects bilingual cognition. However, in return, bilinguals may provide valuable insight into general cognition as well. For example, increased fluency and cultural immersion may provide a valuable window for researchers interested in studying the acquisition of biases and heuristics in real time.

Acknowledging that bilingualism matters and incorporating that acknowledgement into our research designs cost very little. Cross-national datasets regularly collect basic linguistic data about the respondent as well as the interview, but most major political science studies do not incorporate this information. New experiments and surveys may control for a major source of cognitive variation by collecting more information on linguistic background, such as incorporating elements of the Language Experience and Proficiency Questionnaire (LEAP-Q) (Marian, Blumenfeld, and Kaushanskaya 2007) or by developing a simple battery of language background questions for use in political science. Though acknowledgement will add linguistic and cultural considerations that further complications to our ability to study the attitudes and behaviors of individuals across national boundaries, doing so will ultimately improve our understanding about the nuanced ways in which language and culture, together and separately, affect political expression and behavior.

Figures and Tables

Table 2.1a: Frequency and relative frequency of responses, gain frame					
Language	Medicine A		Medicine B		Total
	Actual	Proportional	Actual	Proportional	
L1 MSM	62	0.539	53	0.461	115
L2 English	60	0.484	64	0.516	124

Table 2.1b: Frequency and relative frequency of responses, loss frame					
Language	Medicine A		Medicine B		Total
	Actual	Proportional	Actual	Proportional	
L1 MSM	50	0.481	64	0.561	114
L2 English	65	0.533	57	0.467	122

Figure 2.1a: Relative frequency of responses, gain frame

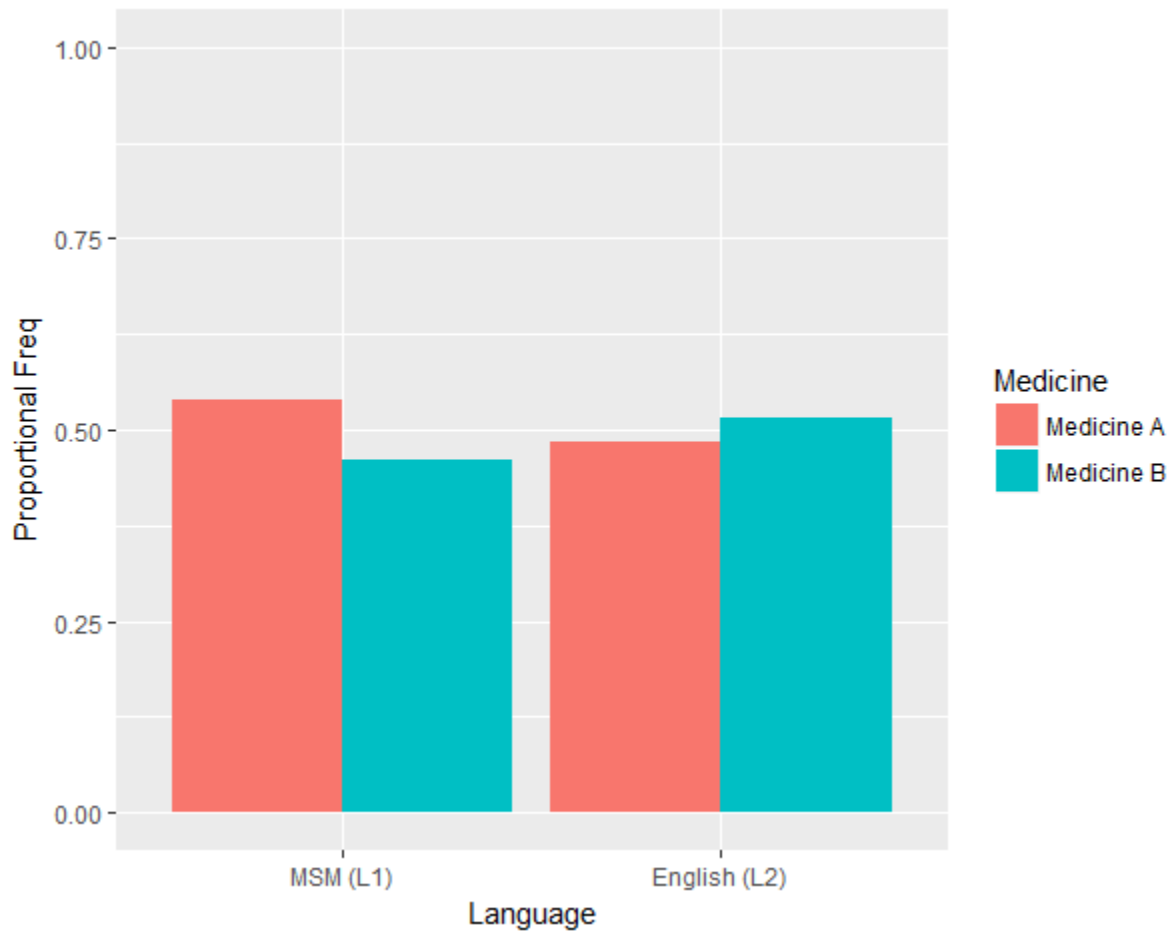


Figure 2.1b: Relative frequency of responses, loss frame

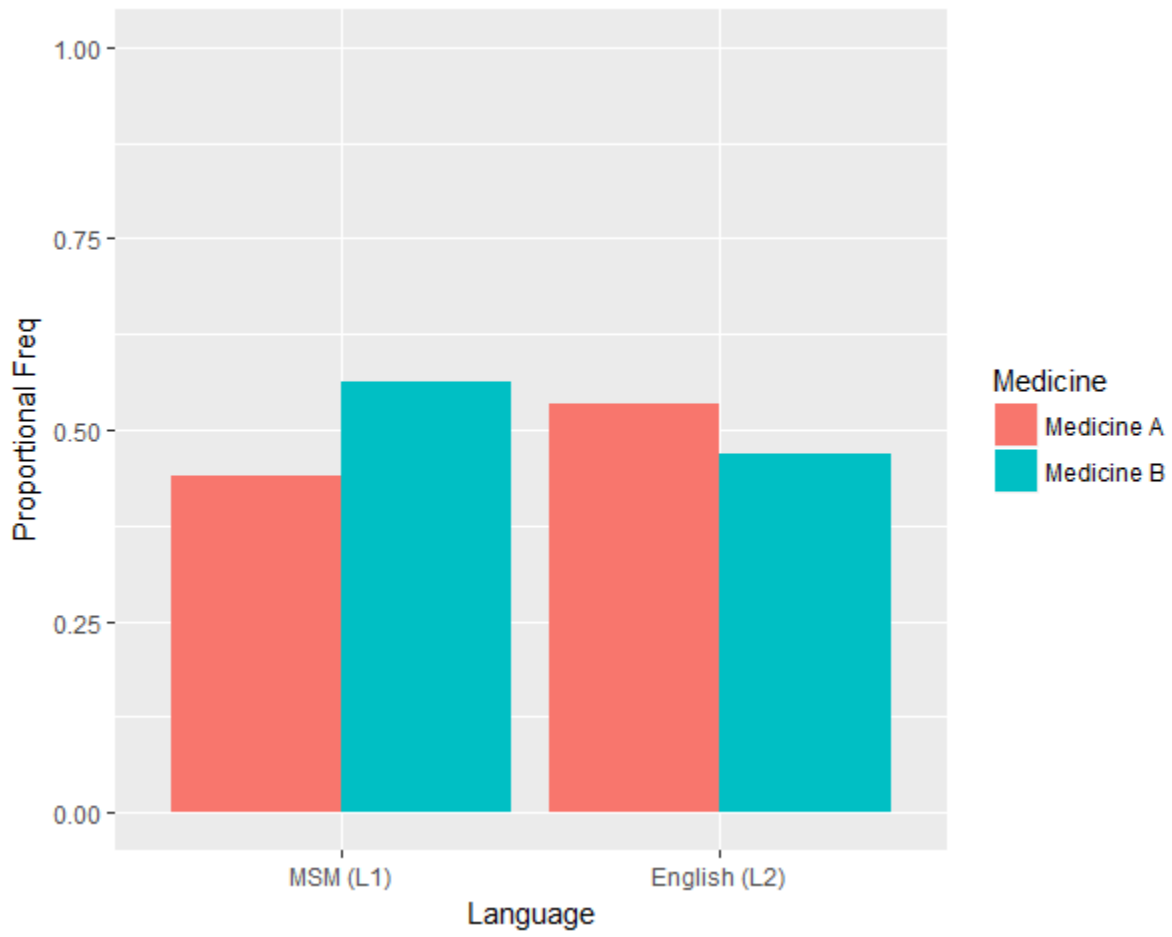


Figure 2.2a: Percentage of bilingual respondents accepting low-stakes bets

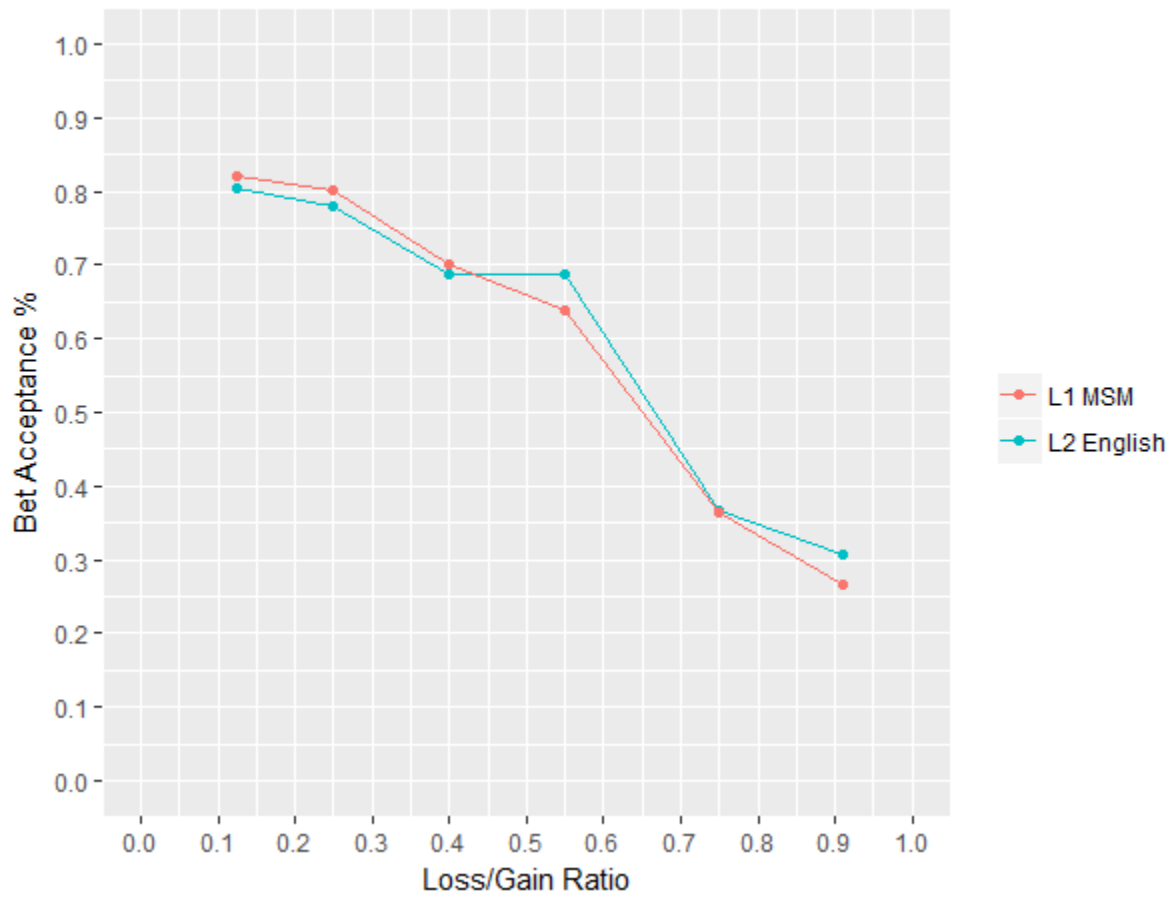


Figure 2.2b: Percentage of bilingual respondents accepting high-stakes bets

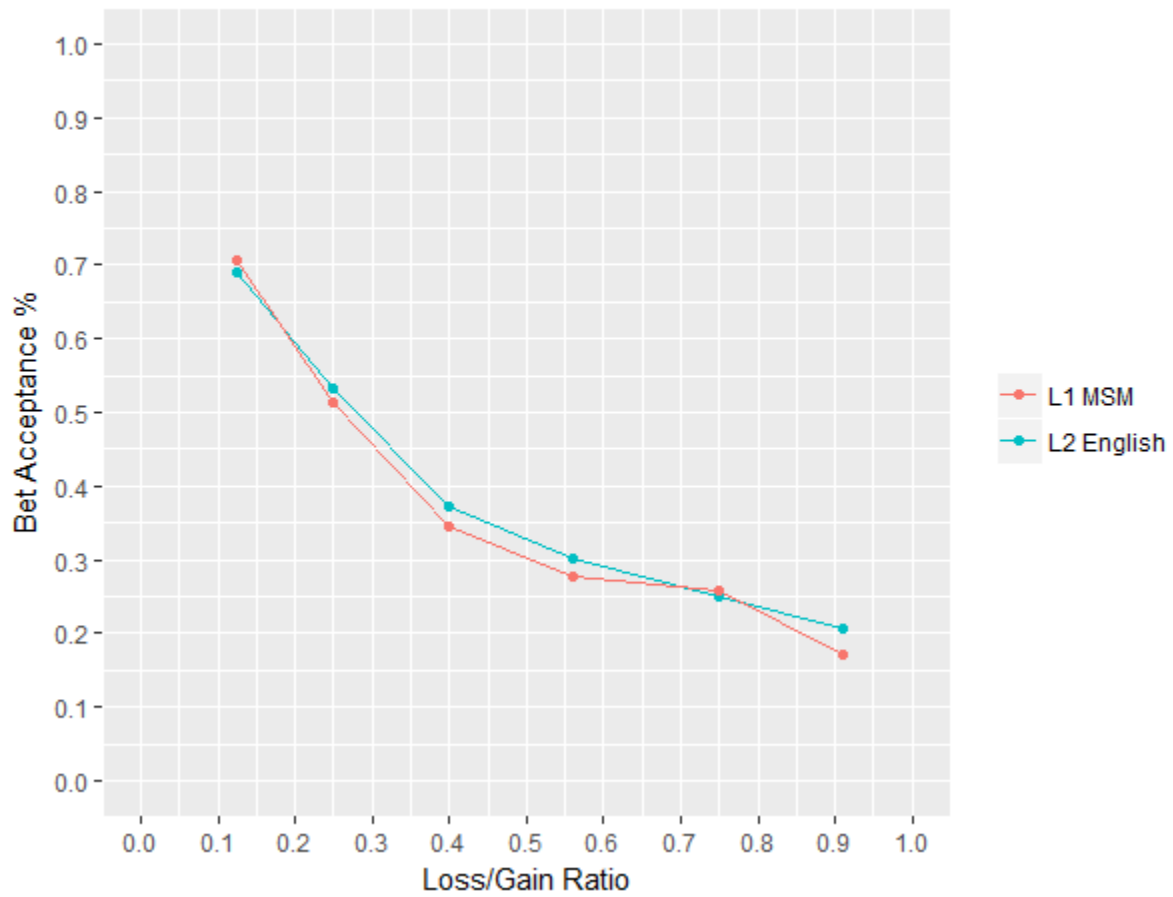


Table 2.2a: Expected values for bets in the high-stakes condition

<i>Win</i>	<i>Lose</i>	<i>Expected value</i>	<i>Loss/Gain Ratio</i>
850	-1130	-140.00	0.752
550	-2200	-825.00	0.250
450	-3600	-1575.00	0.125
650	-1625	-487.50	0.400
950	-1045	-47.50	0.909
750	-1340	-295.00	0.560

Table 2.2b: Expected values for bets in the low-stakes condition

<i>Win</i>	<i>Lose</i>	<i>Expected value</i>	<i>Loss/Gain Ratio</i>
8	-14.5	-3.25	0.552
7	-17.5	-5.25	0.400
10	-11	-0.50	0.909
9	-12	-1.50	0.750
5	-40	-17.50	0.125
6	-24	-9.00	0.250

Table 2.3: Offerer proposals in the Ultimatum Game

		¥5: Low Stakes		¥65: Moderate Stakes		¥475: High Stakes	
		<i>Keep</i>	<i>Give</i>	<i>Keep</i>	<i>Give</i>	<i>Keep</i>	<i>Give</i>
L1 MSM N = 178	<i>Mean</i>	2.73	2.27	27.34	32.7	210.35	265.48
	<i>Std. Dev.</i>	1.08	1.08	6.87	6.86	63.18	64.49
L2 English N=169	<i>Mean</i>	2.71	2.30	28.4	31.64	218.39	257.2
	<i>Std. Dev.</i>	1.17	1.17	7.01	7.01	58.22	59.17

Figure 2.3a: Relative frequency of offers in the ¥5 condition

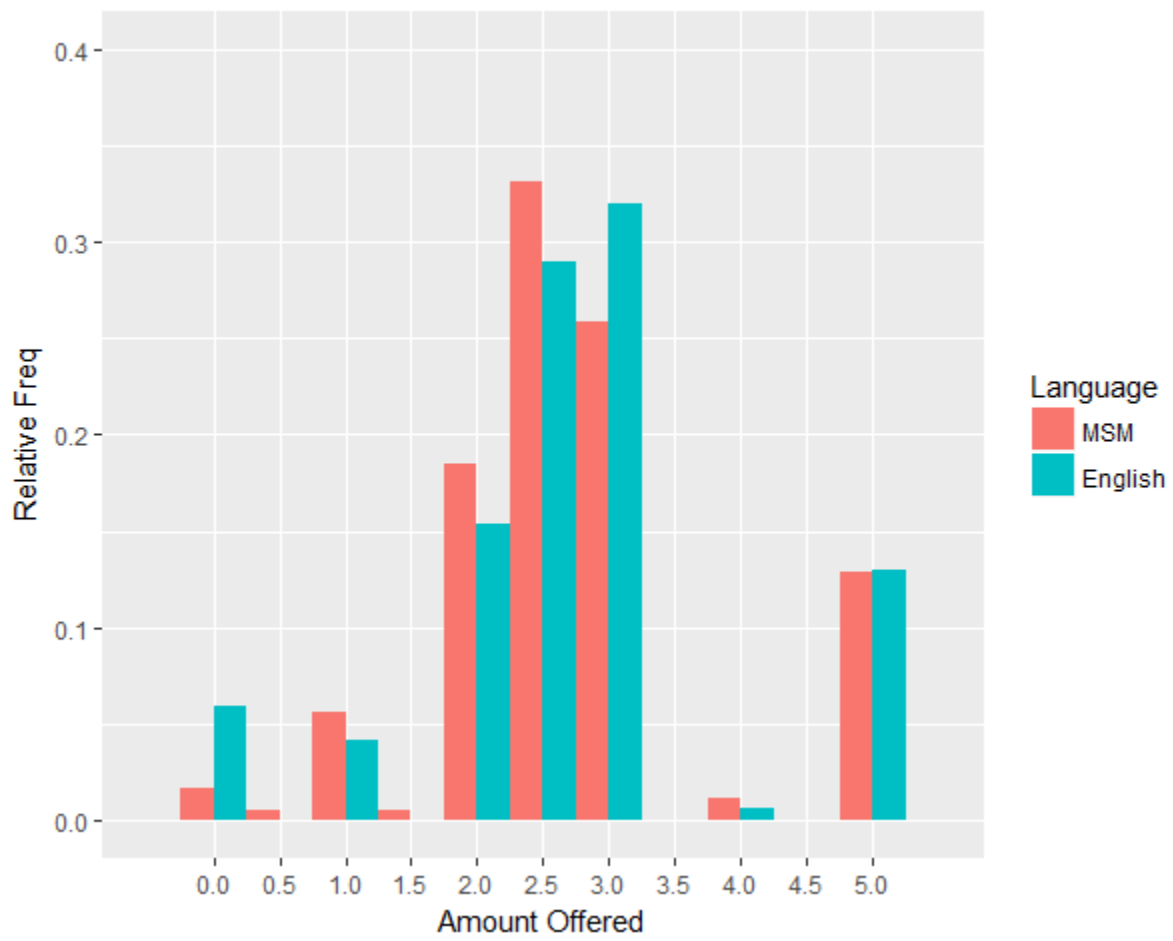


Figure 2.3b: Relative frequency of offers in the ¥60 condition

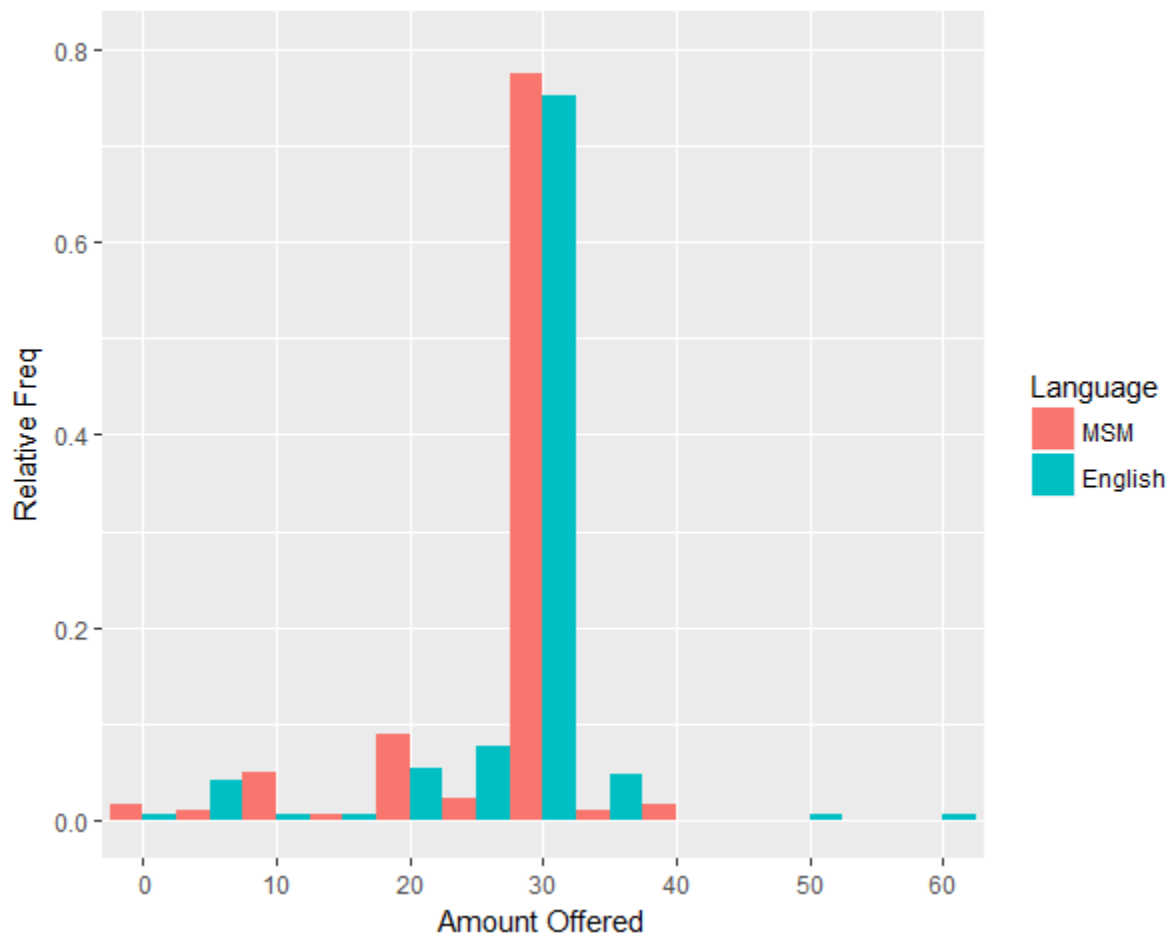


Figure 2.3c: Relative frequency of offers in the ¥475 condition

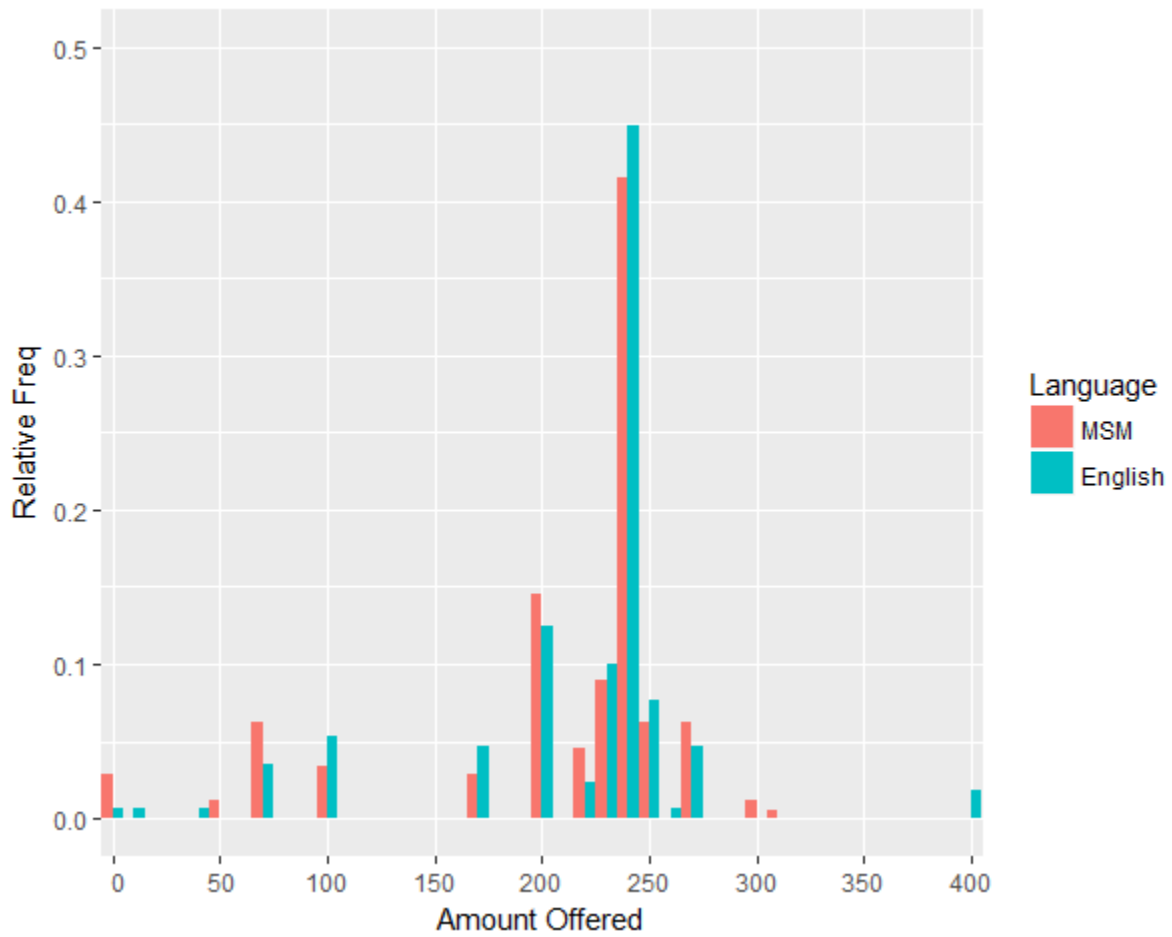


Table 2.4: Response frequency of responders in the Ultimatum Game				
			¥20 - 4/16 split	¥100 - 20/80 split
L1 MSM N = 224	#		75	79
			0.335	0.35
L2 English N = 240	#		105	94
			0.438	0.39

Table 3.1: Frequency of news consumption

		<i>Everyday</i>	%	<i>Several Times</i>	%	<i>Once or Twice</i>	%	<i>Less than Once a Week</i>	%	<i>Do Not Use</i>	%	N
Newspapers	<i>MSM</i>	5	0.060	6	0.072	18	0.217	25	0.301	29	0.349	83
	<i>English</i>	7	0.076	7	0.076	16	0.174	26	0.283	36	0.391	92
Television	<i>MSM</i>	2	0.024	12	0.141	29	0.341	19	0.224	23	0.271	85
	<i>English</i>	4	0.044	14	0.154	27	0.297	24	0.264	22	0.242	91
Radio	<i>MSM</i>	3	0.036	11	0.131	16	0.190	21	0.250	33	0.393	84
	<i>English</i>	7	0.077	10	0.110	9	0.099	23	0.253	42	0.462	91
Internet	<i>MSM</i>	51	0.573	17	0.191	14	0.157	4	0.045	3	0.034	89
	<i>English</i>	61	0.622	19	0.194	9	0.092	6	0.061	3	0.031	98

Table 3.2: Descriptive statistics of news consumption

		<i>Median</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>N</i>
Newspaper	<i>MSM</i>	4	3.81	1.17	83
	<i>English</i>	4	3.84	1.24	92
Television	<i>MSM</i>	3	3.58	1.11	85
	<i>English</i>	4	3.51	1.15	91
Radio	<i>MSM</i>	4	3.83	1.19	84
	<i>English</i>	4	3.91	1.31	91
Internet	<i>MSM</i>	1	1.78	1.08	89
	<i>English</i>	1	1.68	1.07	98

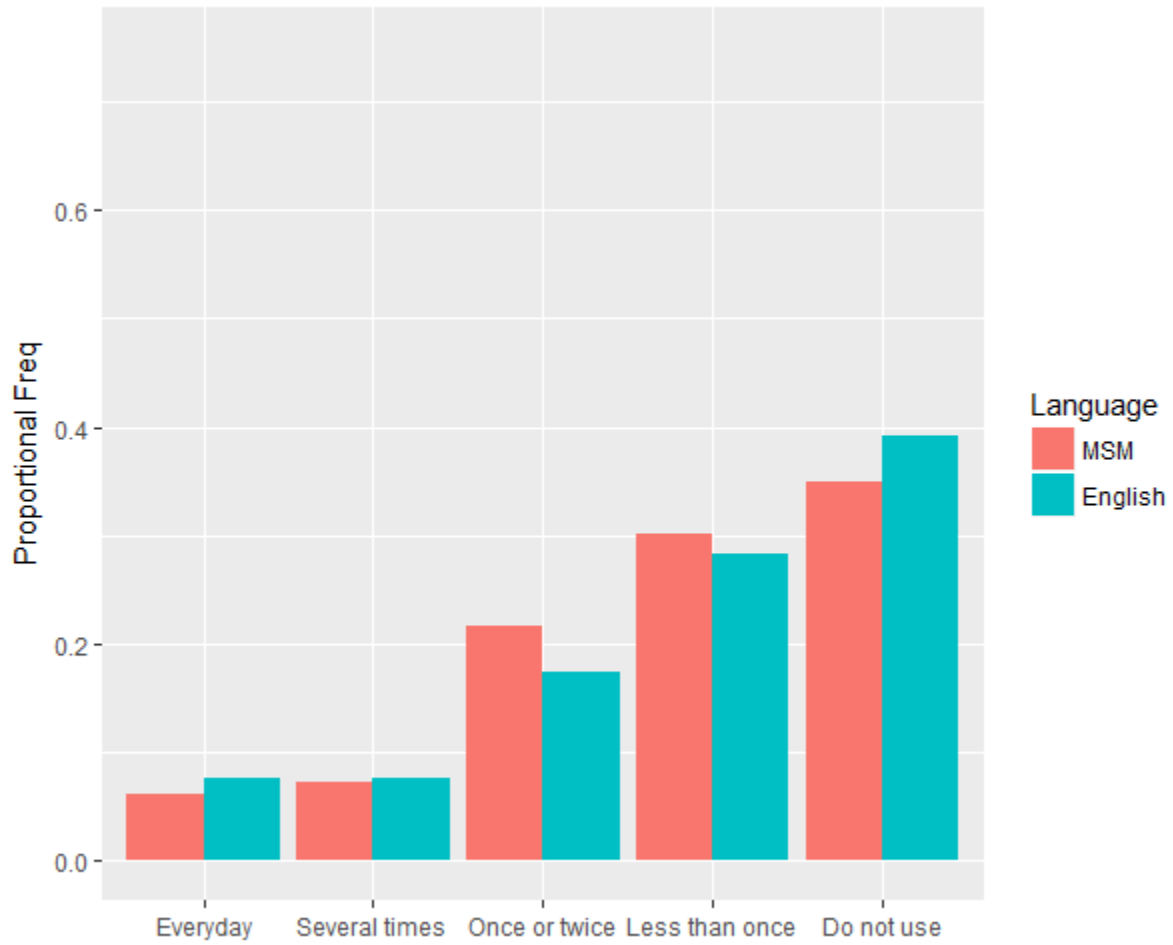


Figure 3.1: Relative frequency of newspaper consumption for political news

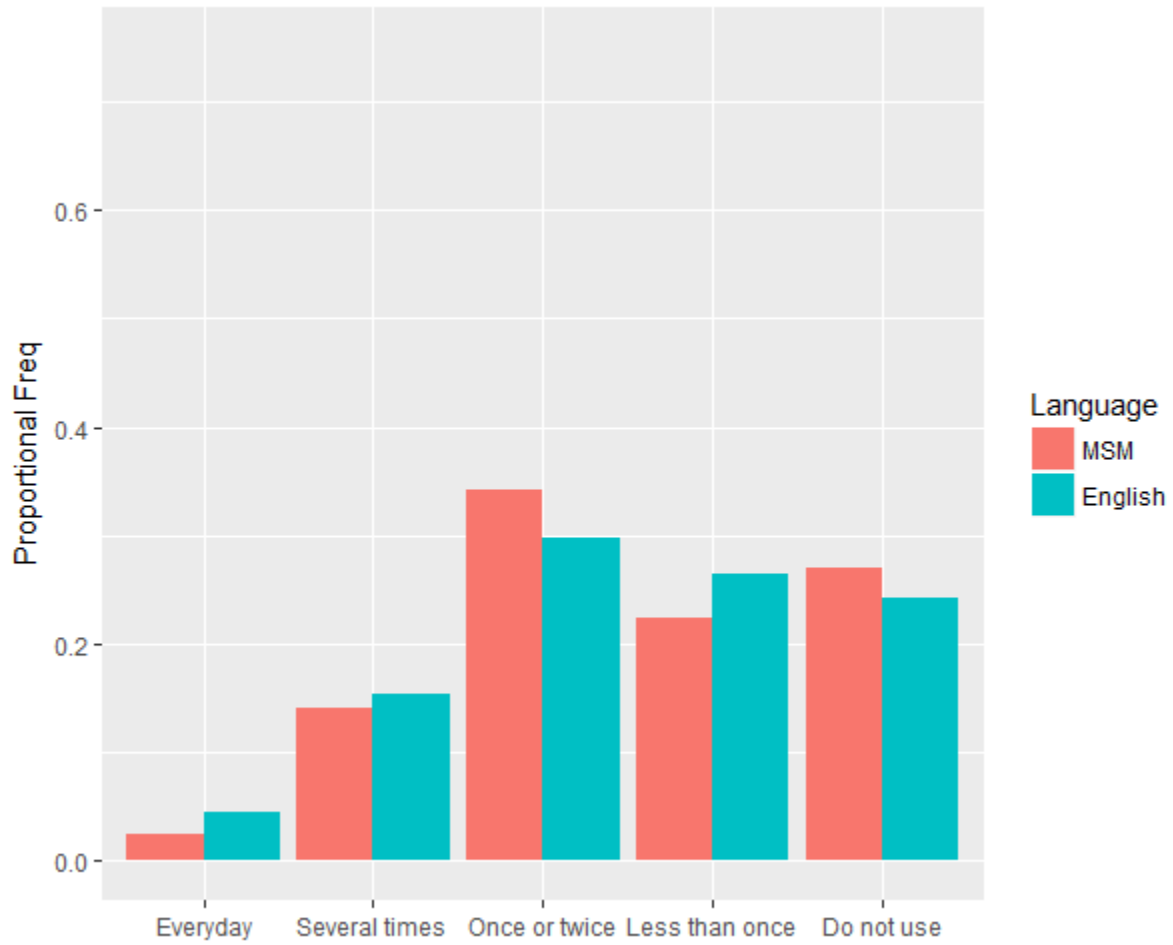


Figure 3.2: Relative frequency of TV consumption for political news

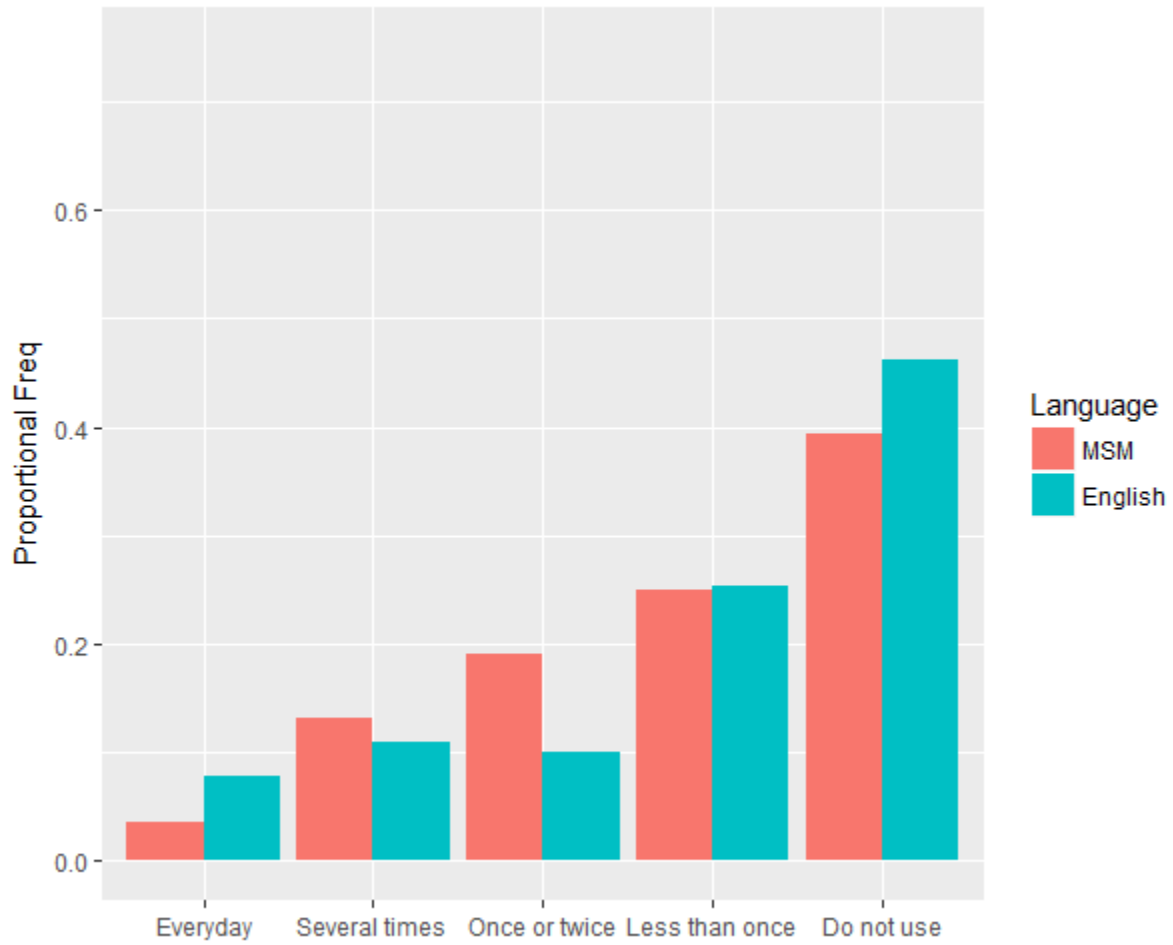


Figure 3.3: Relative frequency of radio consumption for political news

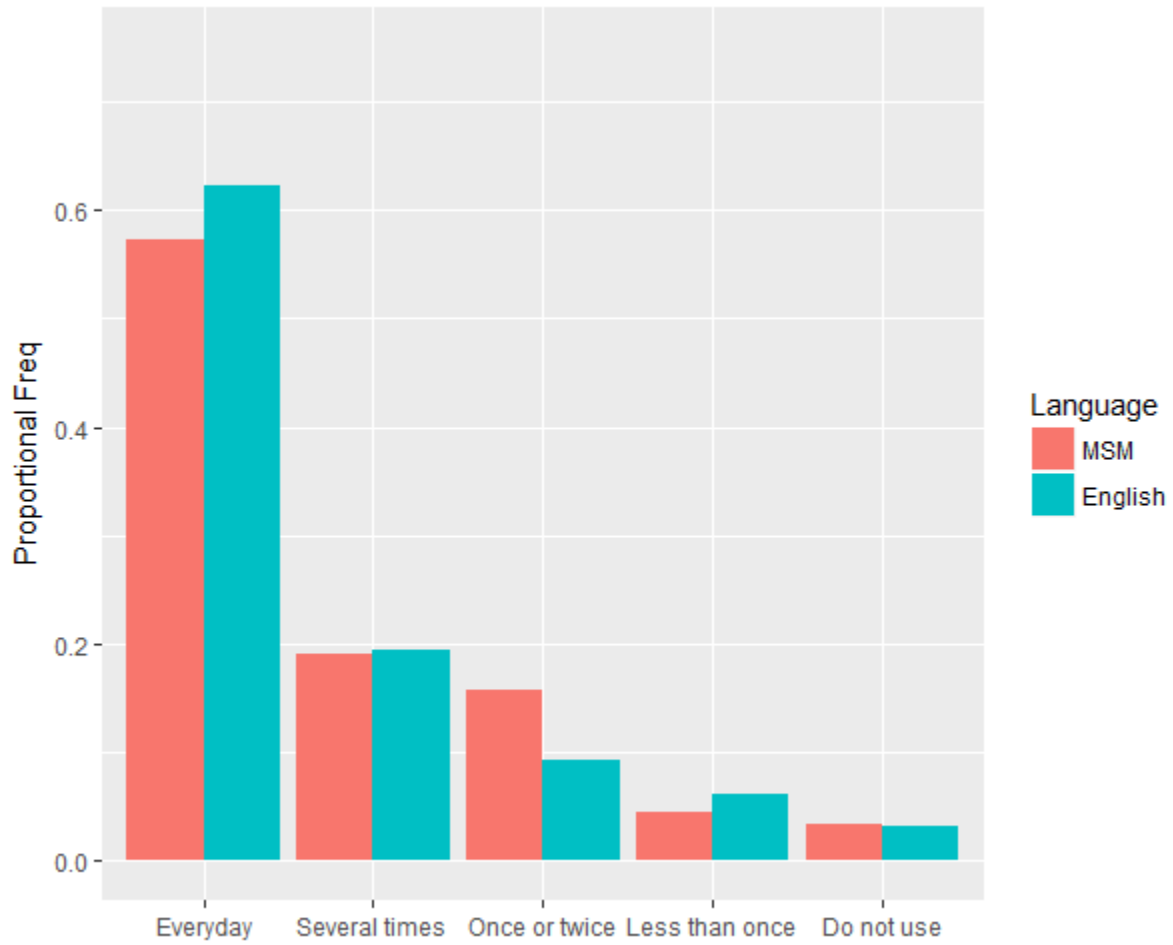


Figure 3.4: Relative frequency of Internet consumption for political news

Table 3.3a: Frequency of political discussion with family and close friends

	<i>Frequently (1)</i>		<i>Occasionally (2)</i>		<i>Never (3)</i>		<i>Total</i>
<i>MSM</i>	4	0.045	77	0.875	7	0.080	88
<i>English</i>	16	0.162	76	0.768	7	0.071	99

Table 3.3b: Descriptive Statistics of political discussion with family and close friends

	<i>Median</i>	<i>Mean</i>	<i>Std. Dev.</i>
<i>MSM</i>	2	2.00	0.394
<i>English</i>	2	1.91	0.476

Table 3.4: Mann-Whitney's U Test Results for Differences in Response Distributions of News Consumption and Discussion

	<i>MSM Median</i>	<i>English Median</i>	<i>U</i>	<i>p</i>	<i>diff in means (t-test p)</i>	η^2	<i>Cohen's D</i>
<i>Newspaper</i>	4	4	3938.5	0.7079	0.871	0.000	0.025
<i>Television</i>	3	4	3762.5	0.7488	0.677	0.001	0.063
<i>Radio</i>	4	4	4060	0.4548	0.677	0.001	0.063
<i>Internet</i>	1	1	4127.5	0.4743	0.562	0.002	0.085
<i>Discussion</i>	2	2	4126.7	0.1483	0.152	0.011	0.207

* Exact *p* could not be computed due to ties. Significance checked with independent-sample *t*-test and OLS

+ Heterogeneous variance, $p < 0.05$

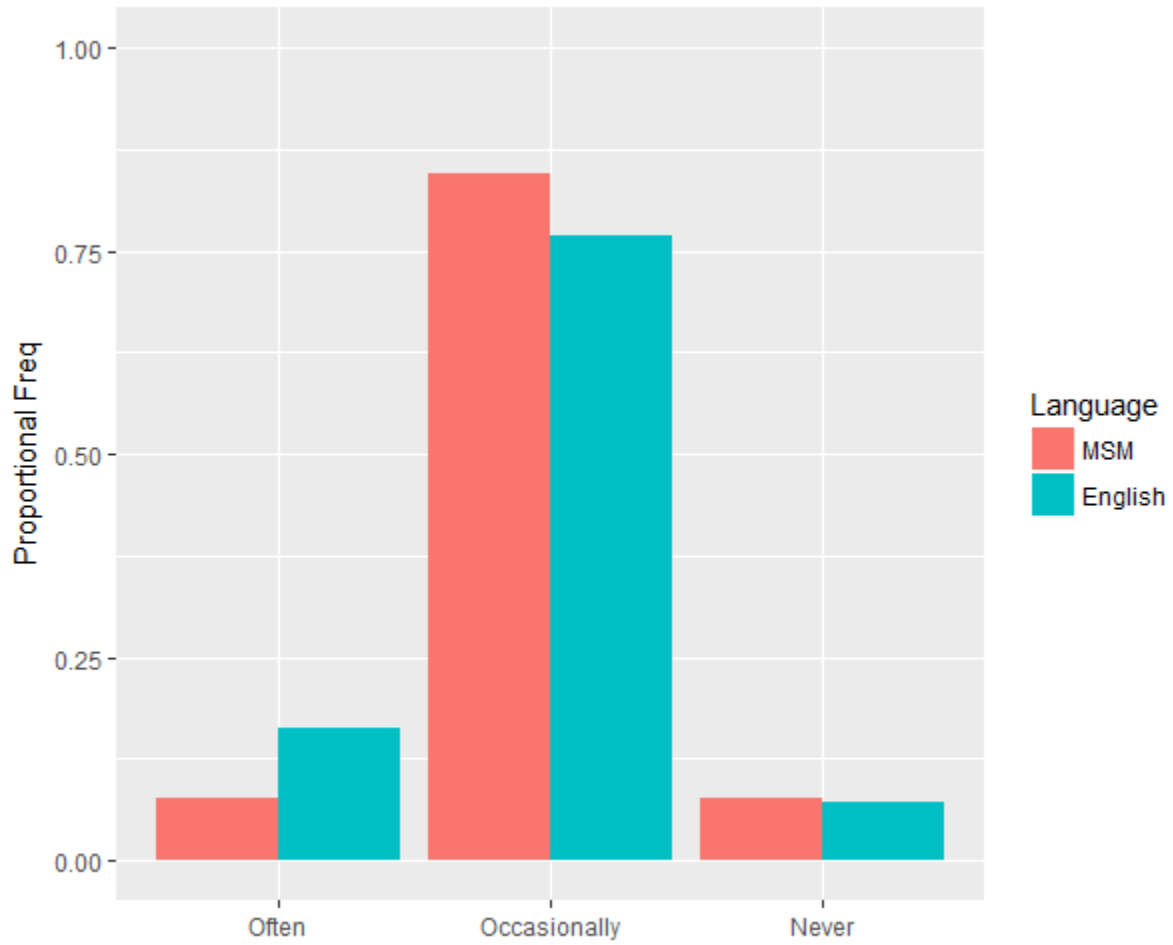


Figure 3.5: Relative frequency of political discussion with family and close friends

Table 3.5 Demographic characteristics of the disaggregated experimental sample

	<i>Chemistry</i>		<i>Foreign Language</i>
<i>N</i>	95		95
<i>Age, avg</i>	19.23		20.98
<i>Age, SD</i>	0.764		2.31
<i>Male/Female</i>	17/78		11/81
<i>MSM Sample N</i>	44		47
<i>MSM ability, avg</i>	8.61		8.22
<i>MSM ability, SD</i>	1.26		1.30
<i>English Sample N</i>	51		48
<i>Eng Ability</i>	7.47		7.19
<i>English Ability, SD</i>	2.17		1.89

Table 3.6a: Frequency of news consumption, Chemistry only

		Everyday	%	Several Times	%	Once or Twice	%	Less than Once a Week	%	Do Not Use	%	N
Newspapers	MSM	2	0.051	0	0.000	7	0.179	12	0.308	18	0.462	39
	English	1	0.027	2	0.051	6	0.154	13	0.333	22	0.564	44
Television	MSM	0	0.000	5	0.128	9	0.231	12	0.308	13	0.333	39
	English	1	0.227	6	0.136	9	0.205	13	0.295	15	0.341	44
Radio	MSM	0	0.000	4	0.102	7	0.179	12	0.308	16	0.410	39
	English	0	0.000	4	0.091	3	0.068	17	0.386	20	0.455	44
Internet	MSM	21	0.488	10	0.233	6	0.140	4	0.093	2	0.047	43
	English	27	0.540	11	0.220	5	0.100	5	0.100	2	0.040	50

Table 3.6b: Frequency of news consumption, FL only

		Everyday	%	Several Times	%	Once or Twice	%	Less than Once a Week	%	Do Not Use	%	N
Newspapers	MSM	3	0.068	6	0.136	11	0.250	13	0.295	11	0.250	44
	English	6	0.125	5	0.104	10	0.208	13	0.271	14	0.292	48
Television	MSM	2	0.043	7	0.152	20	0.435	7	0.152	10	0.217	46
	English	3	0.064	8	0.17	18	0.383	11	0.234	7	0.149	47
Radio	MSM	3	0.067	7	0.156	9	0.200	9	0.200	17	0.379	45
	English	7	0.149	6	0.128	6	0.128	6	0.128	22	0.468	47
Internet	MSM	30	0.600	7	0.14	8	0.16	0	0	1	0.022	46
	English	37	0.708	8	0.167	4	0.083	1	0.021	1	0.021	48

Table 3.7a: Descriptive statistics of news consumption, Chemistry only					
		<i>Median</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>N</i>
Newspaper	<i>MSM</i>	4	4.13	1.06	39
	<i>English</i>	4	4.20	1.00	44
Television	<i>MSM</i>	4	3.85	1.04	39
	<i>English</i>	4	4.20	1.13	44
Radio	<i>MSM</i>	4	4.03	1.01	39
	<i>English</i>	4	4.20	0.93	44
Internet	<i>MSM</i>	2	1.98	1.20	43
	<i>English</i>	2	1.88	1.19	50

Table 3.7b: Descriptive statistics of news consumption, FL only					
		<i>Median</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>N</i>
Newspaper	<i>MSM</i>	4	3.52	1.21	44
	<i>English</i>	4	3.5	1.35	48
Television	<i>MSM</i>	3	3.35	1.12	45
	<i>English</i>	3	3.23	1.11	47
Radio	<i>MSM</i>	4	3.67	1.31	45
	<i>English</i>	4	3.64	1.54	47
Internet	<i>MSM</i>	1	1.59	0.933	46
	<i>English</i>	1	1.48	0.899	48

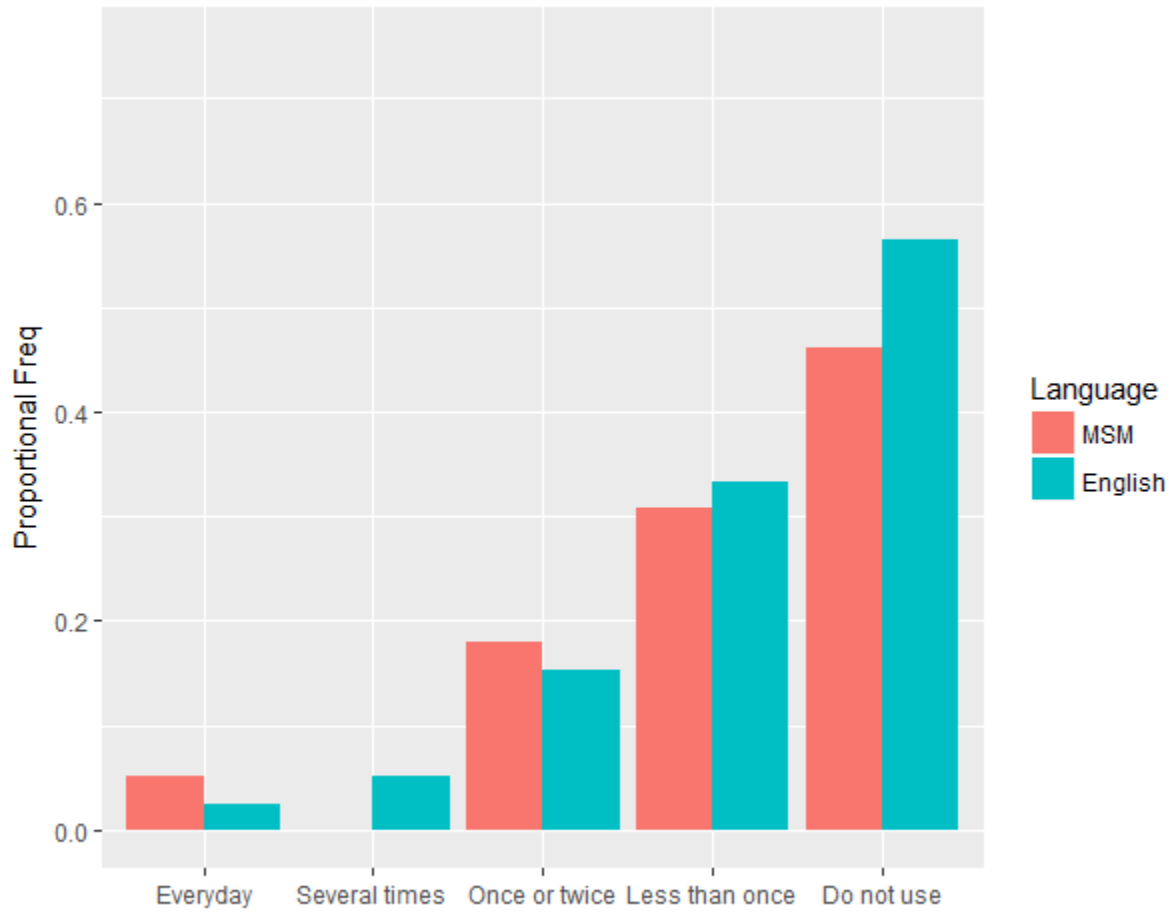


Figure 3.6a: Relative frequency of newspaper consumption for political news, Chemistry only

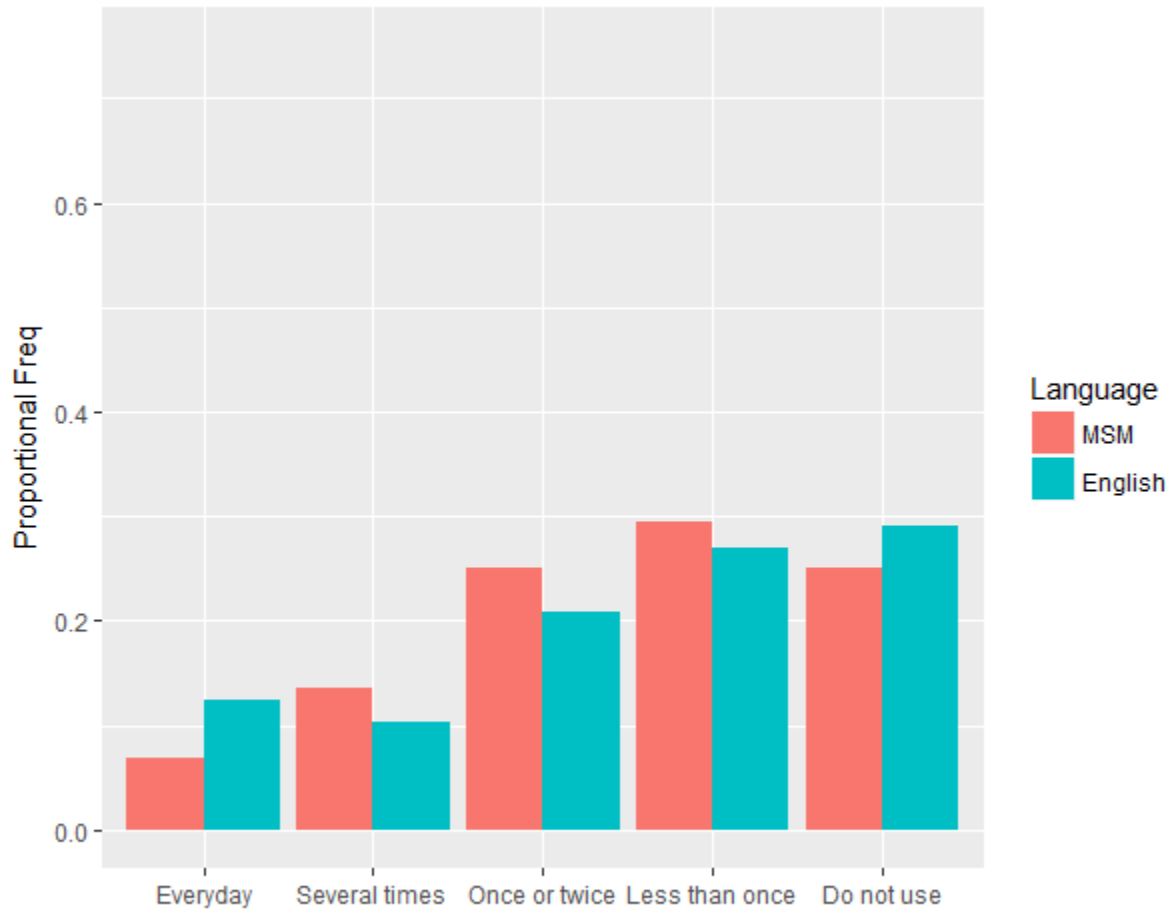


Figure 3.6b: Relative frequency of newspaper consumption for political news, FL only

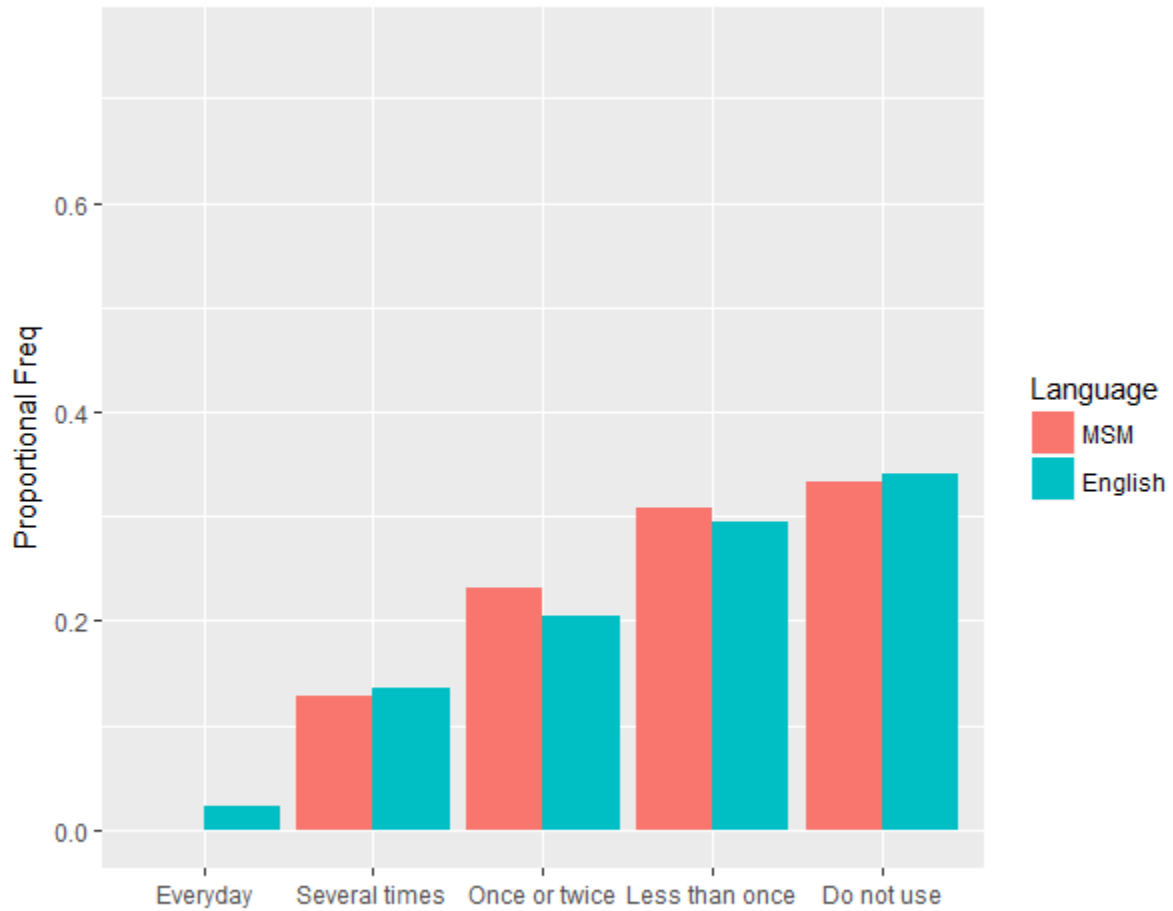


Figure 3.7a: Relative frequency of TV consumption for political news, Chemistry only

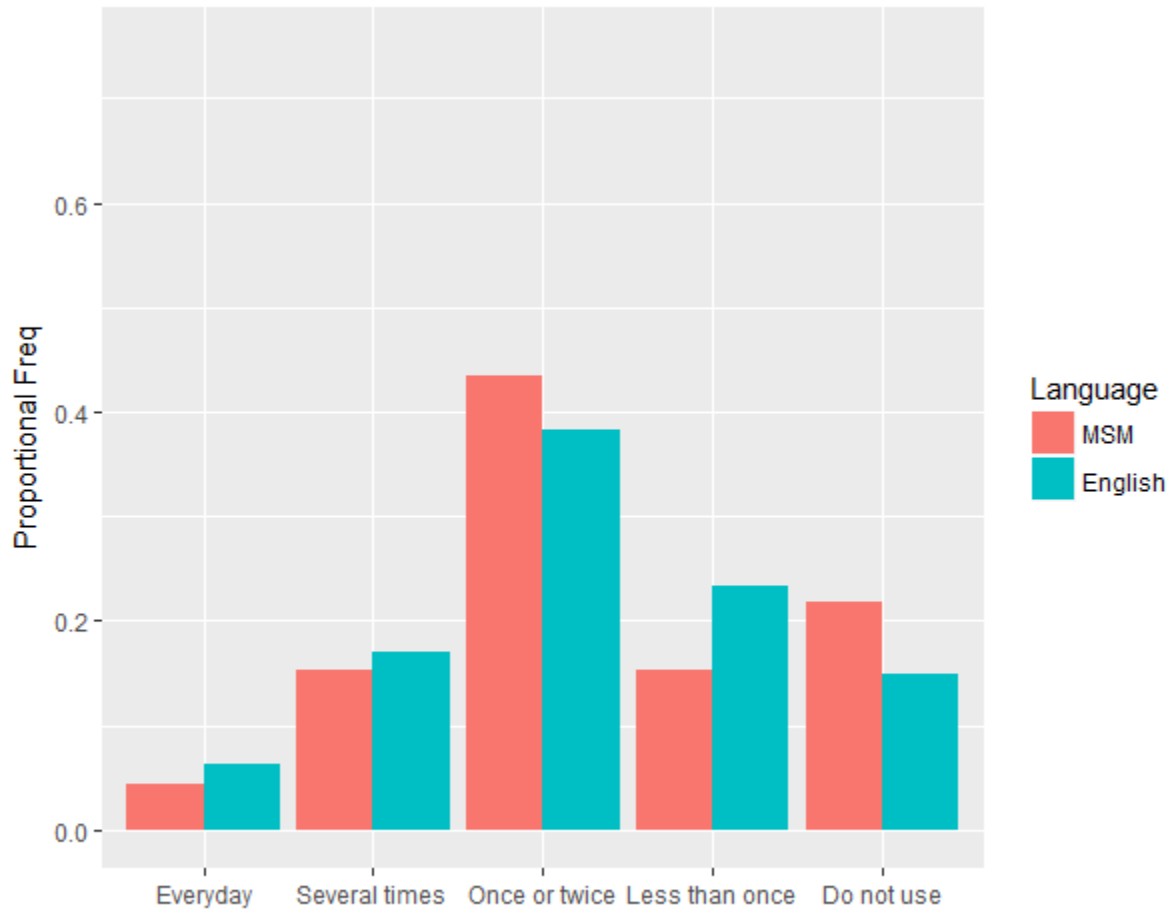


Figure 3.7b: Relative frequency of TV consumption for political news, FL only

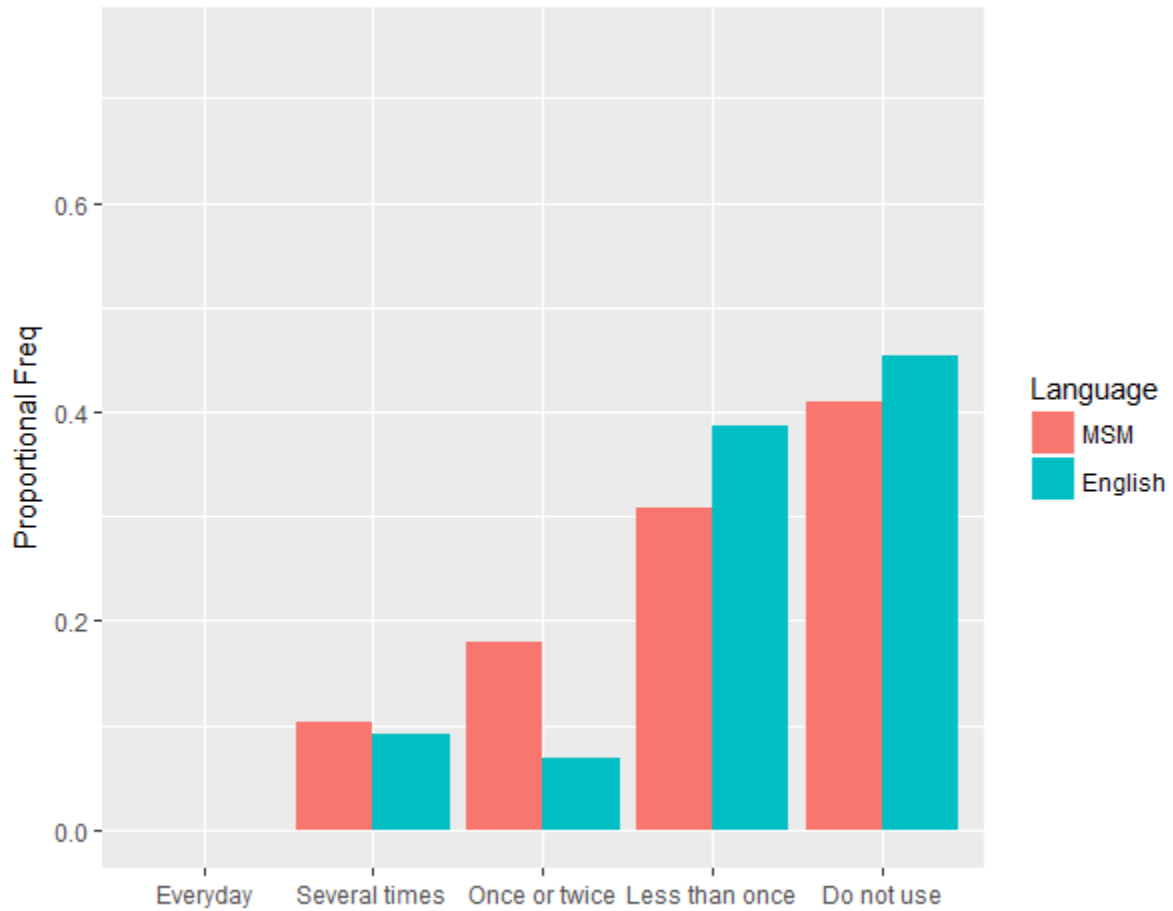


Figure 3.8a: Relative frequency of radio consumption for political news, Chemistry only

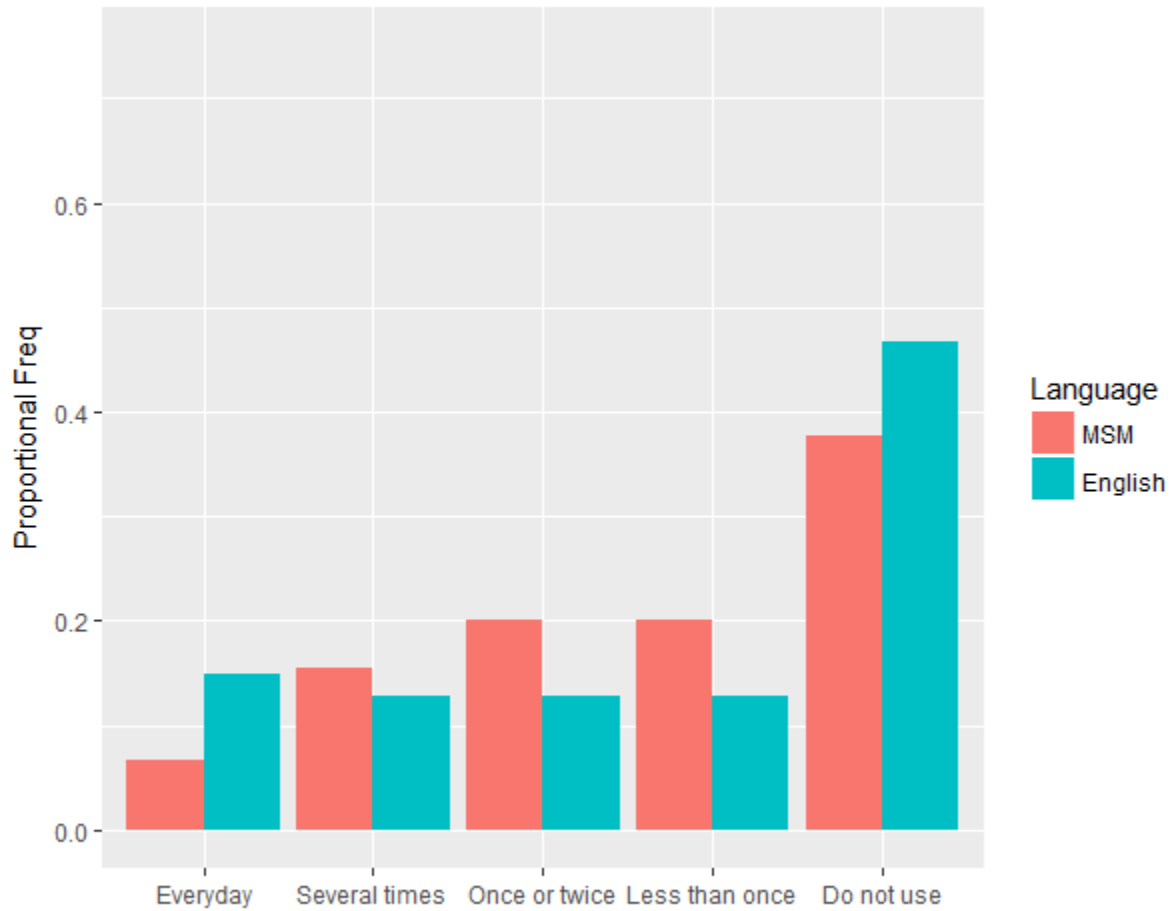


Figure 3.8b: Relative frequency of radio consumption for political news, FL only

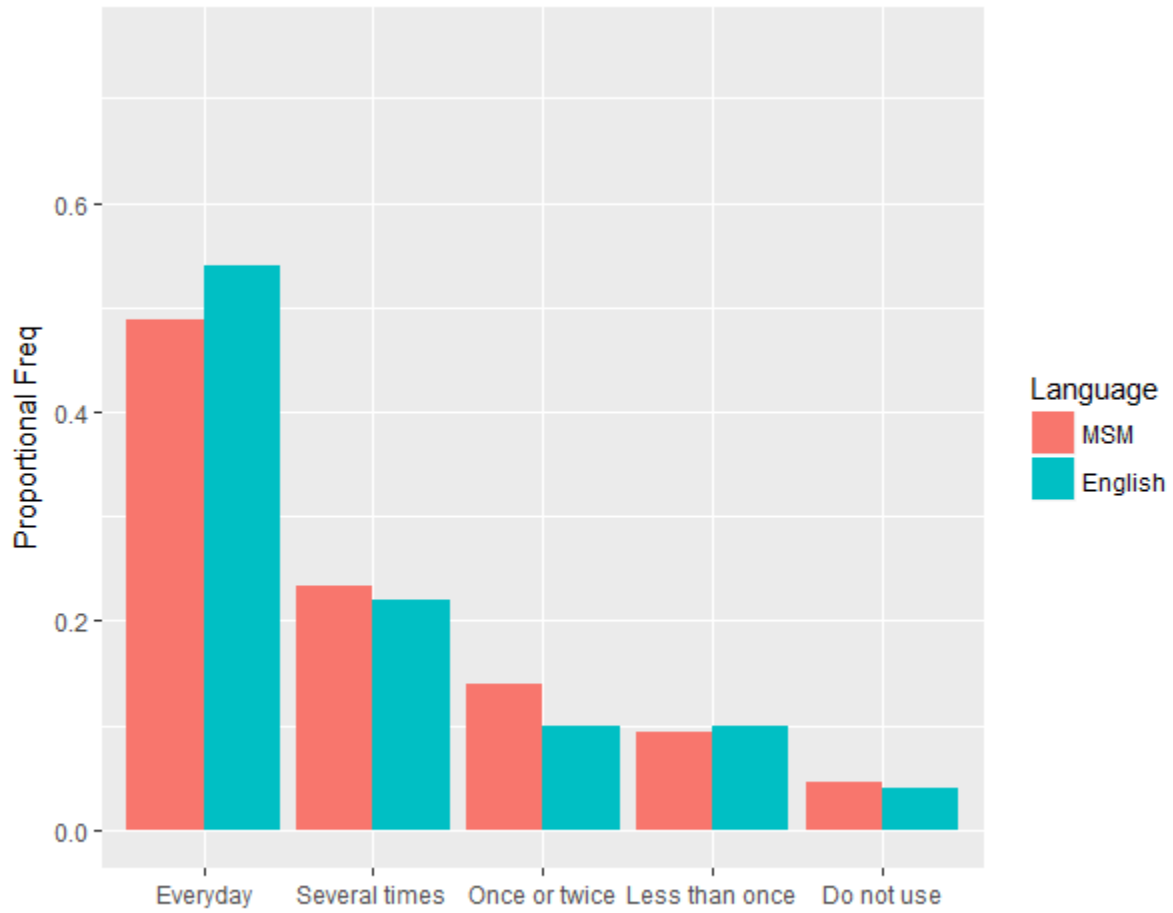


Figure 3.9a: Relative frequency of Internet consumption for political news, Chemistry only

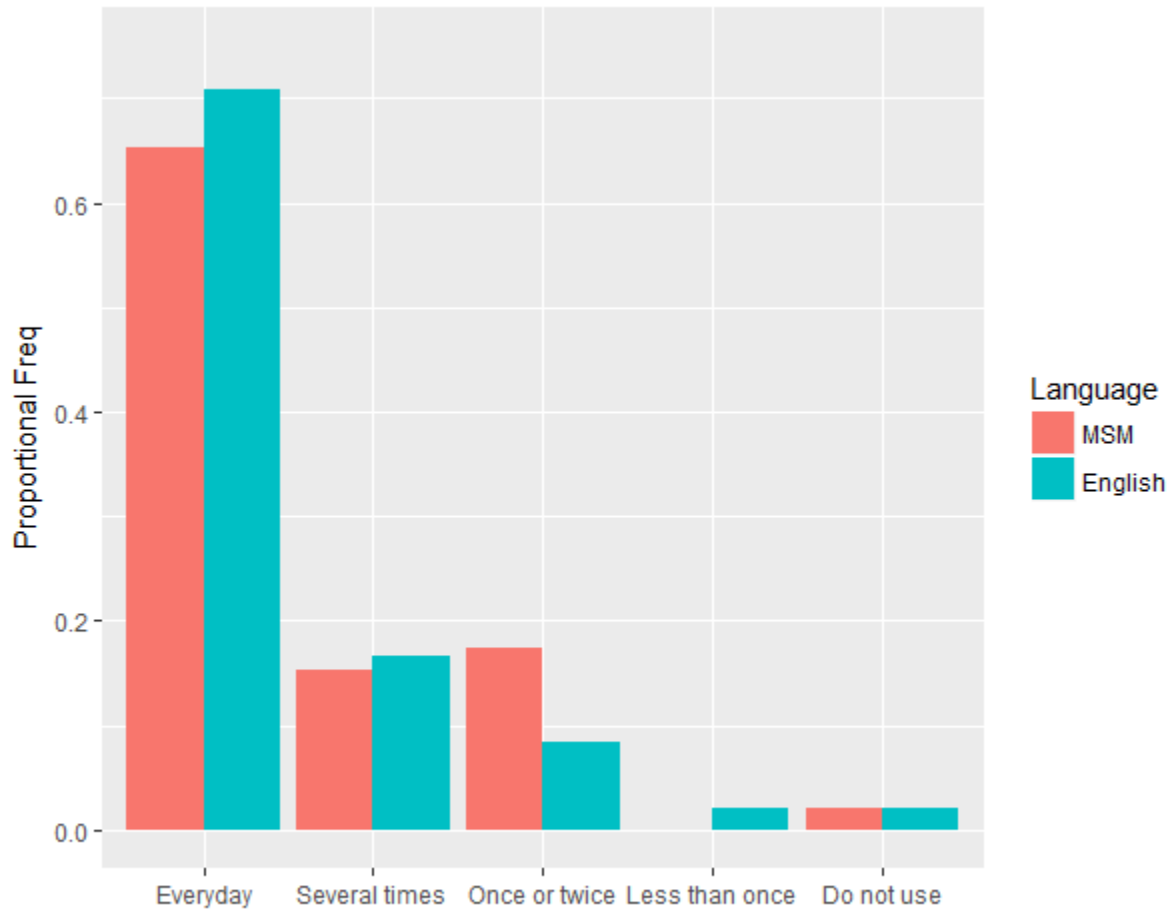


Figure 3.9b: Relative frequency of Internet consumption for political news, FL only

Table 3.8a: Frequency of political discussion with family and close friends, Chemistry only

	<i>Frequently (1)</i>	<i>%</i>	<i>Occasionally (2)</i>	<i>%</i>	<i>Never (3)</i>	<i>%</i>	<i>Total</i>
<i>MSM</i>	3	0.068	36	0.818	5	0.114	44
<i>English</i>	9	0.176	37	0.725	5	0.098	51

Table 3.8b: Frequency of political discussion with family and close friends, FL only

	<i>Frequently (1)</i>	<i>%</i>	<i>Occasionally (2)</i>	<i>%</i>	<i>Never (3)</i>	<i>%</i>	<i>Total</i>
<i>MSM</i>	4	0.085	41	0.872	2	0.043	47
<i>English</i>	7	0.146	39	0.813	2	0.042	48

Table 3.9a: Descriptive Statistics of political discussion with family and close friends, Chemistry only

	<i>Median</i>	<i>Mean</i>	<i>Std. Dev.</i>
<i>MSM</i>	2	2.05	0.429
<i>English</i>	2	1.92	0.523

Table 3.9b: Descriptive Statistics of political discussion with family and close friends, FL only

	<i>Median</i>	<i>Mean</i>	<i>Std. Dev.</i>
<i>MSM</i>	2	1.96	0.359
<i>English</i>	2	1.90	0.425

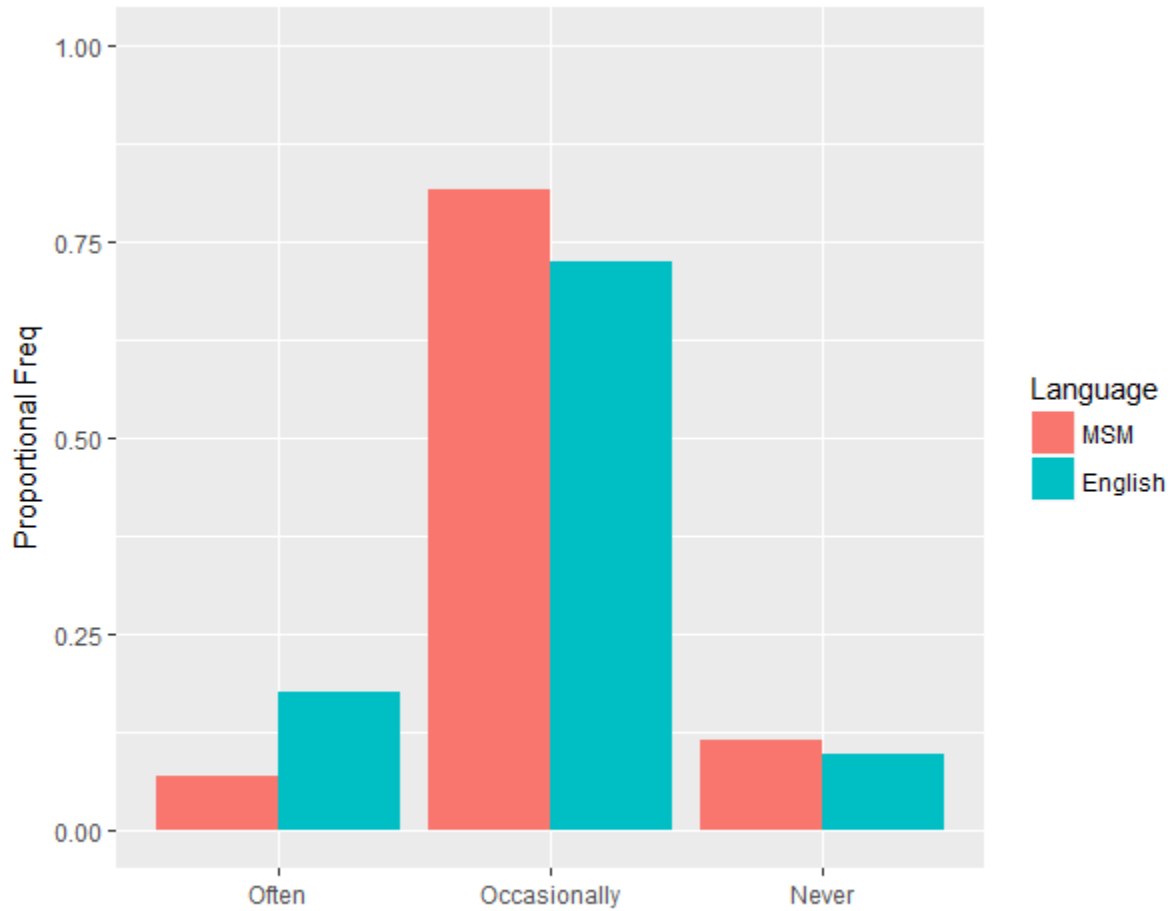


Figure 3.10a: Relative frequency of political discussion with family and close friends, Chemistry only

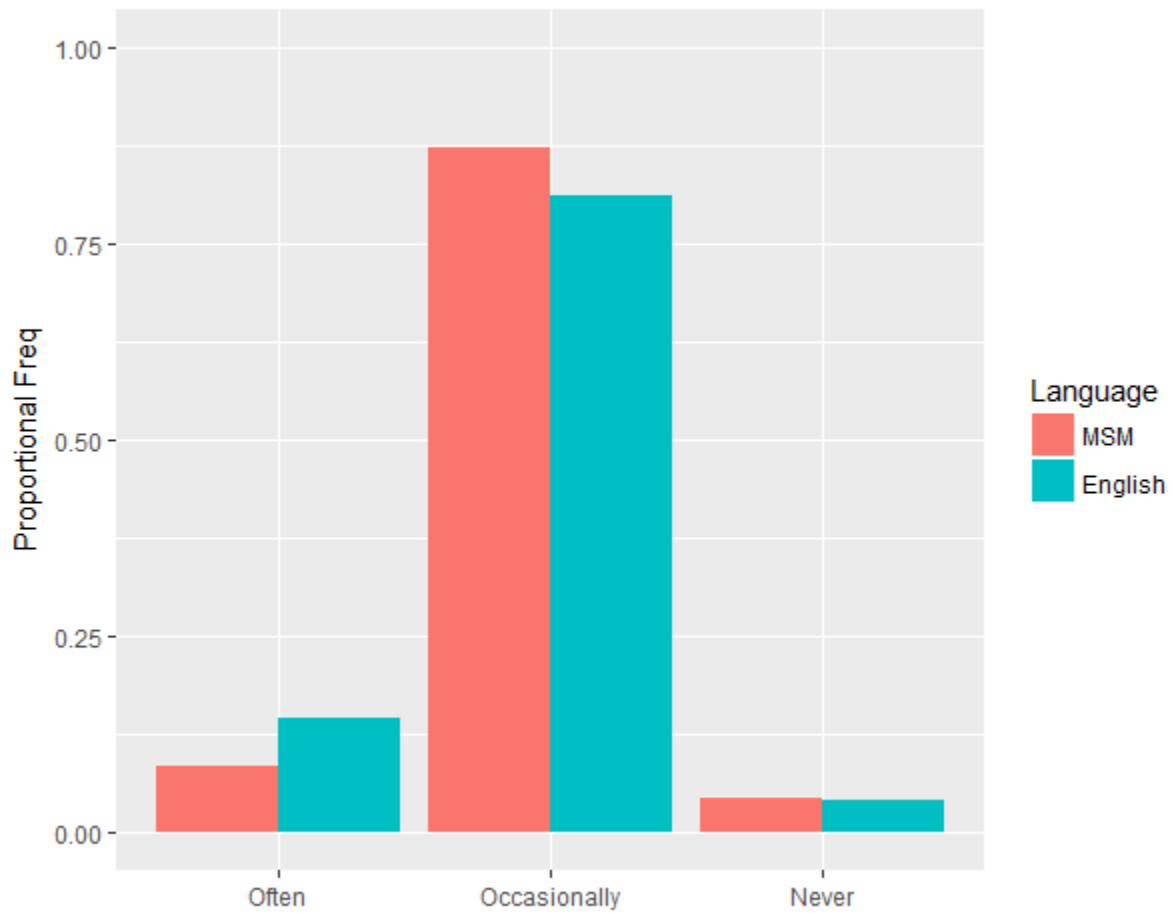


Figure 3.10b: Relative frequency of political discussion with family and close friends, FL only

Table 3.10a: Mann-Whitney's U Test Results for Differences in Response Distributions of News Consumption and Discussion, MSM responses

	<i>Chem, median</i>	<i>FL, median</i>	<i>U</i>	<i>p</i>		<i>Diff in means (t-test p)</i>	η^2	<i>Cohen's D</i>
Newspaper	4	4	736.5	0.009	*+	0.017	0.081	0.588
Television	4	3	743.5	0.017		0.037	0.001	0.501
Radio	4	4	886	0.213	*+	0.162	0.000	0.442
Internet	2	1	975.5	0.066		0.093	0.000	0.379
Discussion	2	2	1201	0.831		0.293	0.000	0.054

* Exact *p* could not be computed due to ties. Significance checked with independent-sample *t*-test and OLS

+ Heterogeneous variance, $p < 0.05$

Table 3.10b: Mann-Whitney's U Test Results for Differences in Response Distributions of News Consumption and Discussion, English responses

	<i>Chem, median</i>	<i>FL, median</i>	<i>U</i>	<i>p</i>		<i>Diff in means (t-test p)</i>	η^2	<i>Cohen's D</i>
Newspaper	4	4	600.5	0.014	*	0.005	0.067	0.531
Television	4	3	672.5	0.040	*	0.019	0.000	0.460
Radio	4	4	761.5	0.279	*+	0.036	0.000	0.303
Internet	2	1	811	0.103	*	0.062	0.000	0.363
Discussion	2	2	950	0.290	*	0.788	0.000	0.223

* Exact *p* could not be computed due to ties. Significance checked with independent-sample *t*-test and OLS

+ Heterogeneous variance, $p < 0.05$

Table 3.11a: Mann-Whitney's U Test Results for Differences in Response Distributions of News Consumption and Discussion, Chemistry only

	<i>MSM Median</i>	<i>English Median</i>	<i>U</i>	<i>p</i>		<i>Diff in means (t-test p)</i>	η^2	<i>Cohen's D</i>
Newspaper	4	4	893	0.734	*	0.737	0.001	0.074
Television	4	4	848	0.928		0.832	0.001	0.047
Radio	4	4	939.5	0.429	*	0.406	0.009	0.185
Internet	2	2	1018.5	0.639		0.699	0.002	0.081
Discussion	2	2	998	0.211		0.208	0.017	0.257

* Exact *p* could not be computed due to ties. Significance checked with independent-sample t-test and OLS

+ Heterogeneous variance, $p < 0.05$

Table 3.11b: Mann-Whitney's U Test Results for Differences in Response Distributions of News Consumption and Discussion, FL only

	<i>MSM Median</i>	<i>English Median</i>	<i>U</i>	<i>p</i>		<i>Diff in means (t-test p)</i>	η^2	<i>Cohen's D</i>
Newspaper	4	4	1067.5	0.929	*	0.587	0.000	0.018
Television	3	3	1033.5	0.706	*	0.624	0.003	0.103
Radio	4	4	1080.5	0.854	*	0.924	0.000	0.020
Internet	1	1	1032.5	0.514	*	0.570	0.004	0.118
Discussion	2	2	1061.5	0.438	*	0.447	0.006	0.157

* Exact *p* could not be computed due to ties. Significance checked with independent-sample t-test and OLS

+ Heterogeneous variance, $p < 0.05$

Table 3.12 Disaggregated demographic characteristics of the language groups

	<i>MSM</i>		<i>V2 English</i>		<i>Pooled English</i>
<i>N</i>	95		147		246
<i>Age, avg</i>	20.2		20.3		20.2
<i>Age, SD</i>	2.02		1.20		1.48
<i>Male/Female</i>	16/73		44/102		56/188
<i>MSM ability, avg</i>	8.41				
<i>MSM ability, SD</i>	1.29				
<i>Eng Ability</i>			6.43		6.8
<i>English Ability, SD</i>			2.22		2.19

Table 3.13: Descriptive statistics of news consumption

		<i>Median</i>	<i>Mean</i>	<i>Std. Dev.</i>	<i>N</i>
Newspaper	<i>MSM</i>	4	3.81	1.17	83
	<i>V2 English</i>	4	3.49	1.31	142
	<i>English (pooled)</i>	4	3.63	1.29	234
Television	<i>MSM</i>	3	3.58	1.11	85
	<i>V2 English</i>	3	2.96	1.08	142
	<i>English (pooled)</i>	3	3.17	1.14	234
Radio	<i>MSM</i>	4	3.83	1.19	84
	<i>V2 English</i>	4	3.96	1.13	139
	<i>English (pooled)</i>	4	3.94	1.20	234
Internet	<i>MSM</i>	1	1.78	1.08	89
	<i>V2 English</i>	1	1.53	0.93	141
	<i>English (pooled)</i>	1	1.59	0.99	239

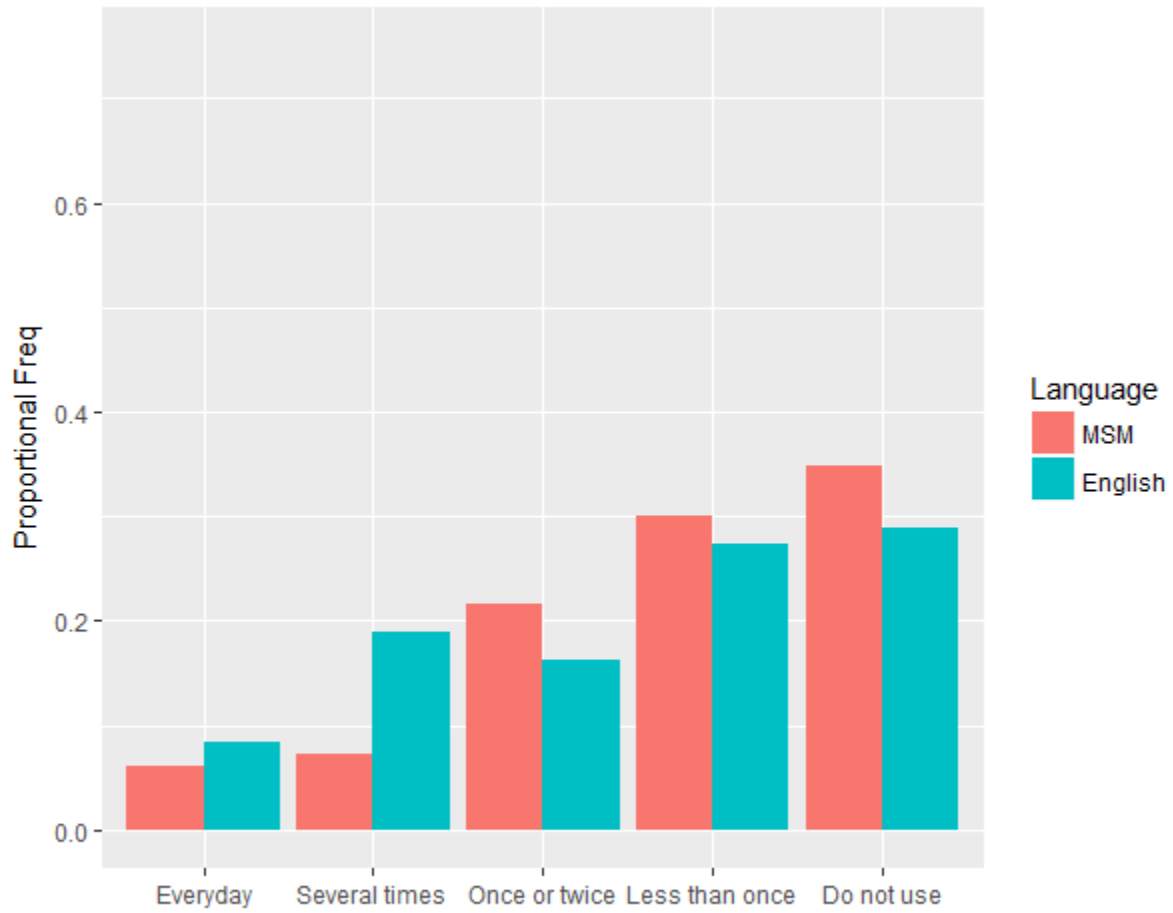


Figure 3.11a: Relative frequency of newspaper consumption for political news, MSM v V2 English comparison

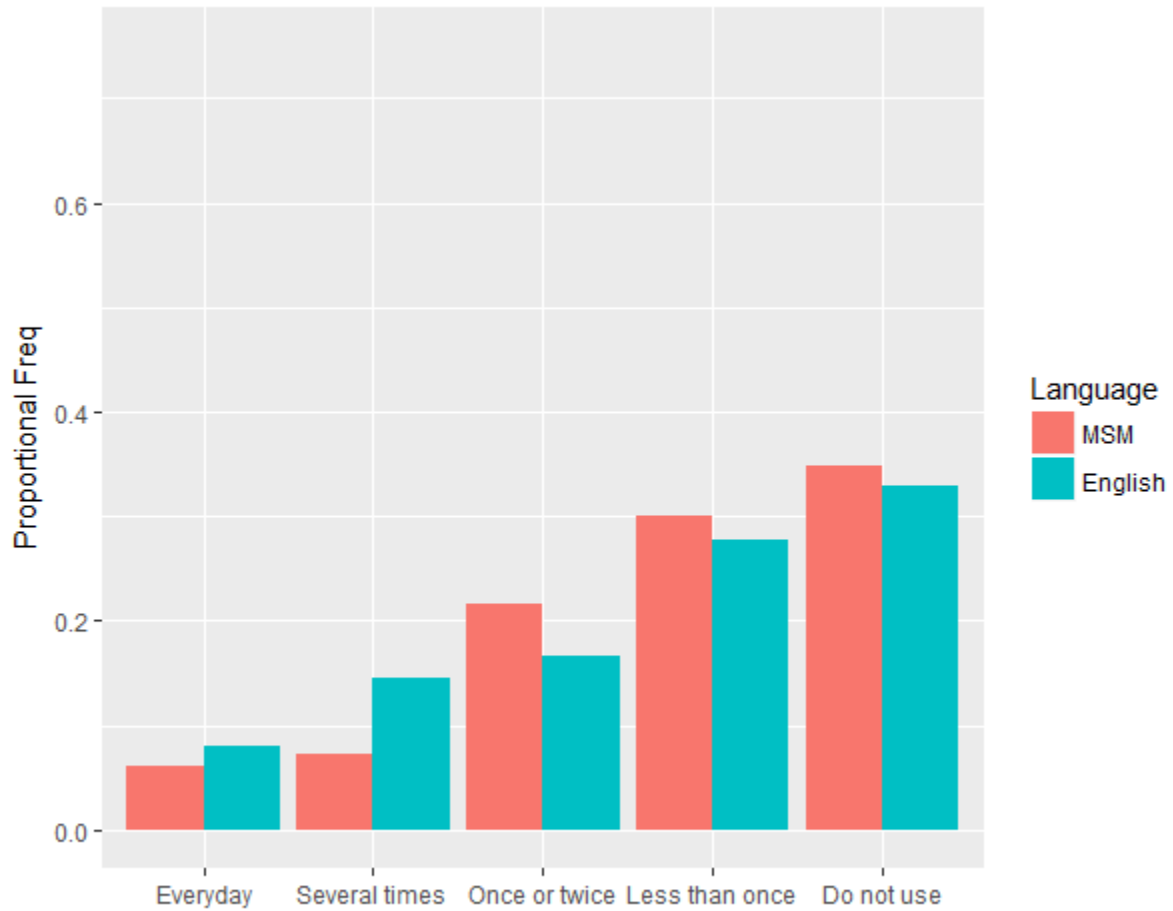


Figure 3.11b: Relative frequency of newspaper consumption for political news, MSM v Pooled English comparison

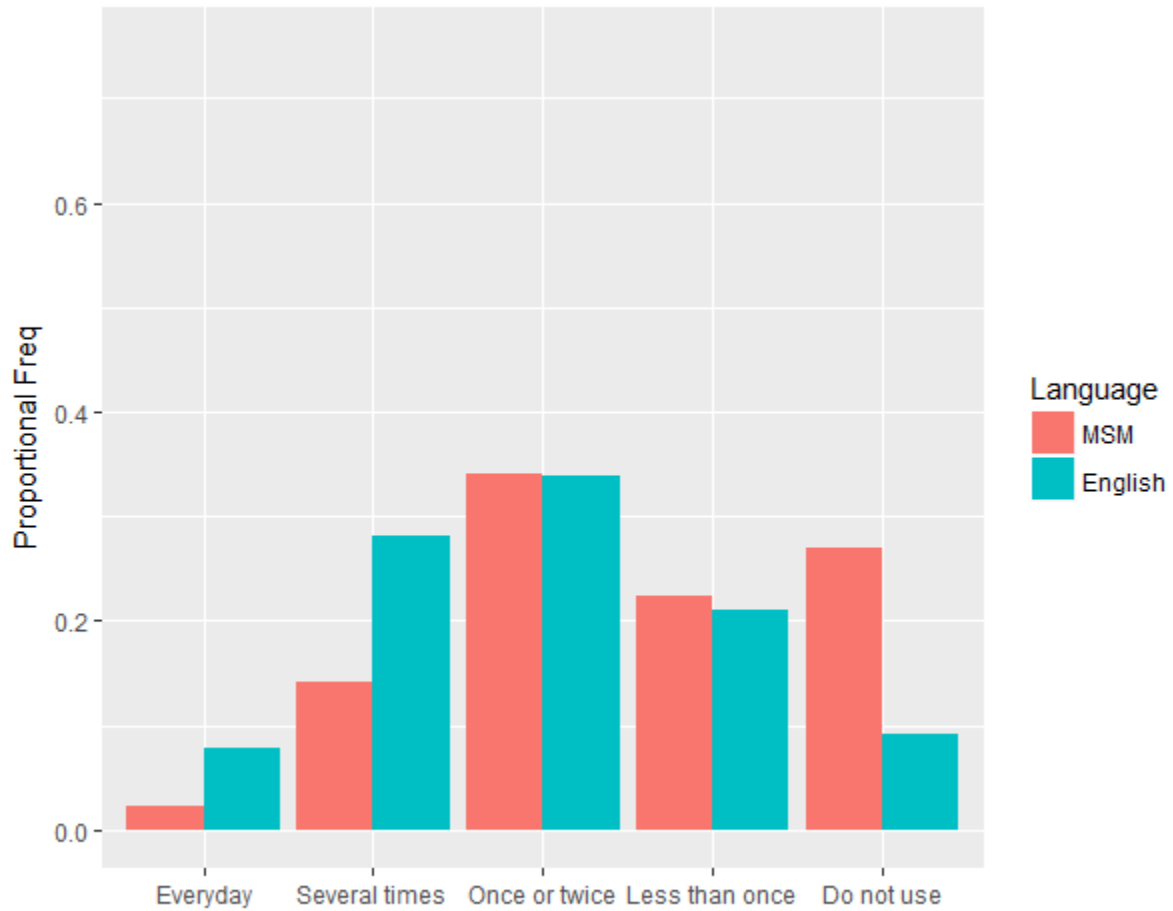


Figure 3.12a: Relative frequency of TV consumption for political news, MSM v V2 English comparison

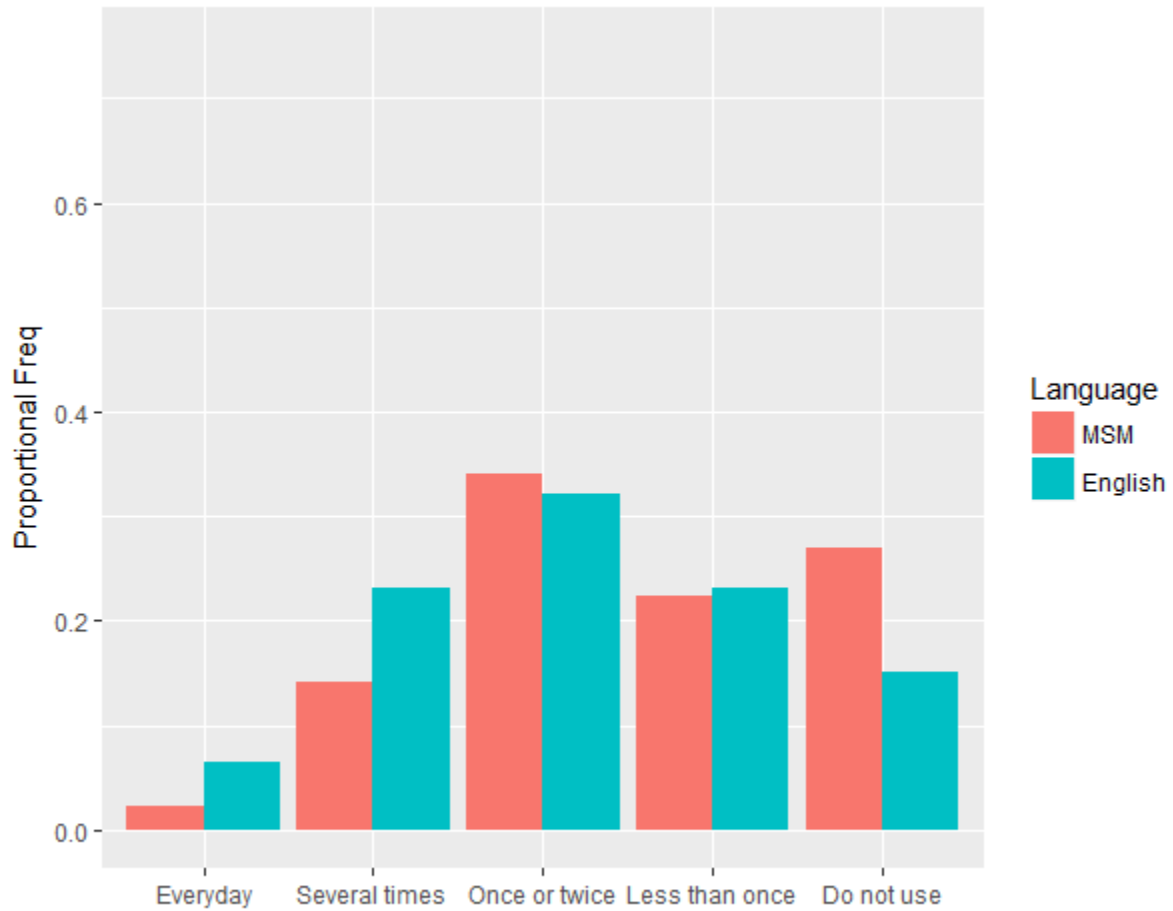


Figure 3.12b: Relative frequency of TV consumption for political news, MSM v Pooled English comparison

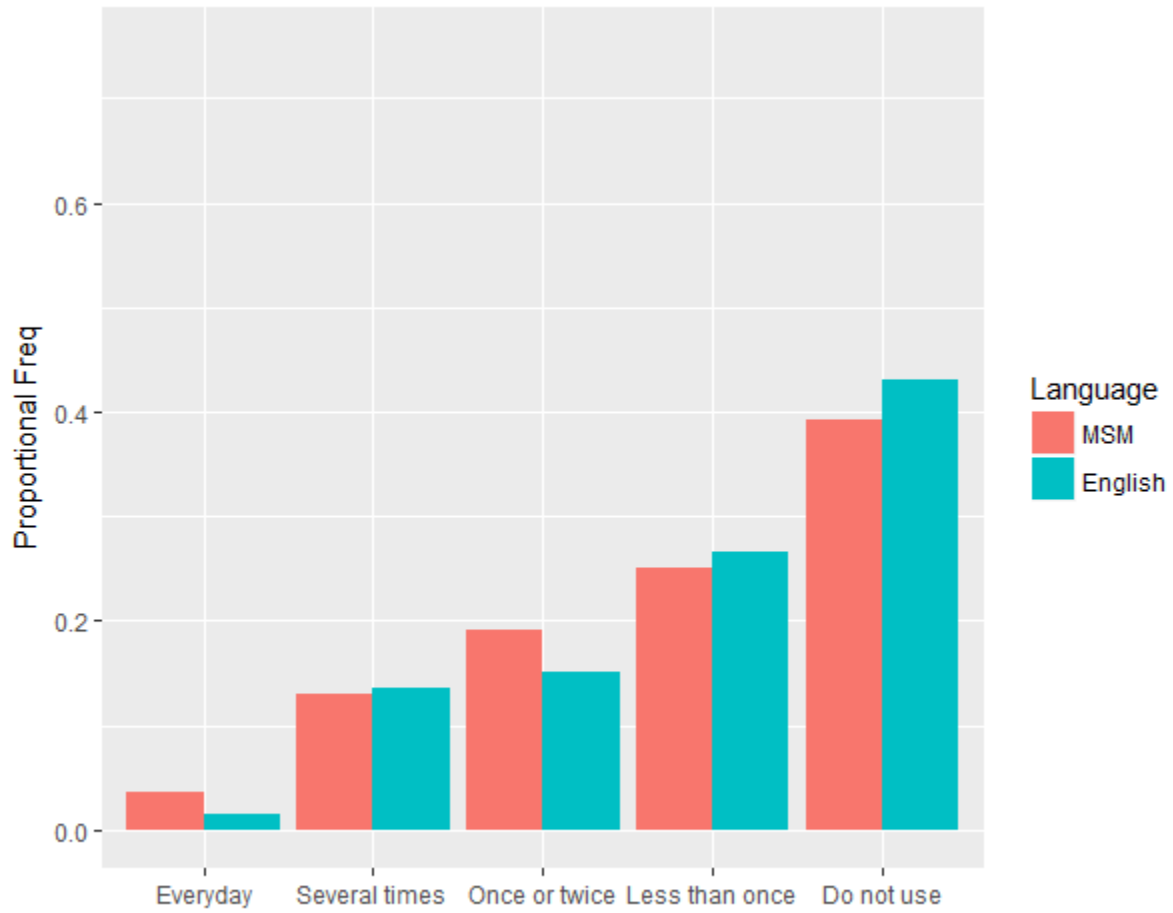


Figure 3.13a: Relative frequency of radio consumption for political news, MSM v V2 English

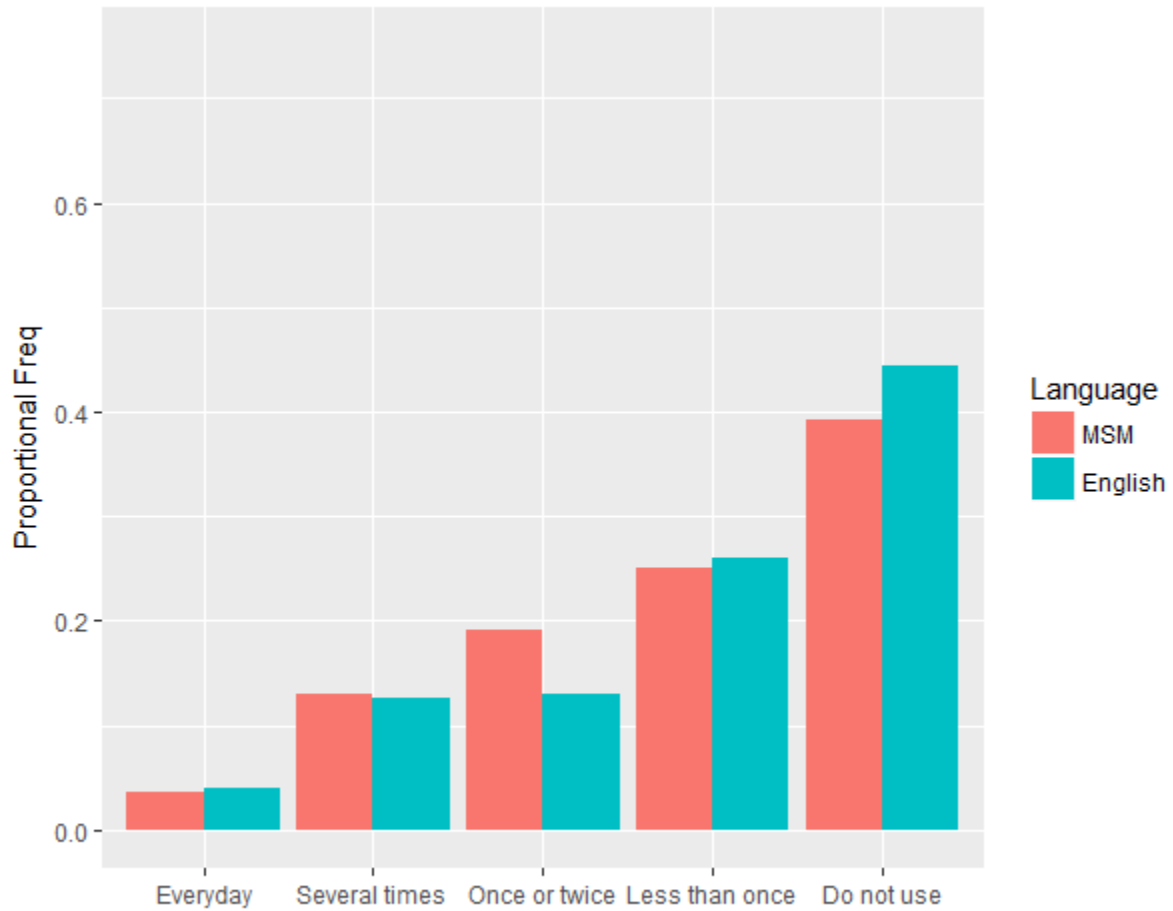


Figure 3.13b: Relative frequency of radio consumption for political news, MSM v Pooled English comparison

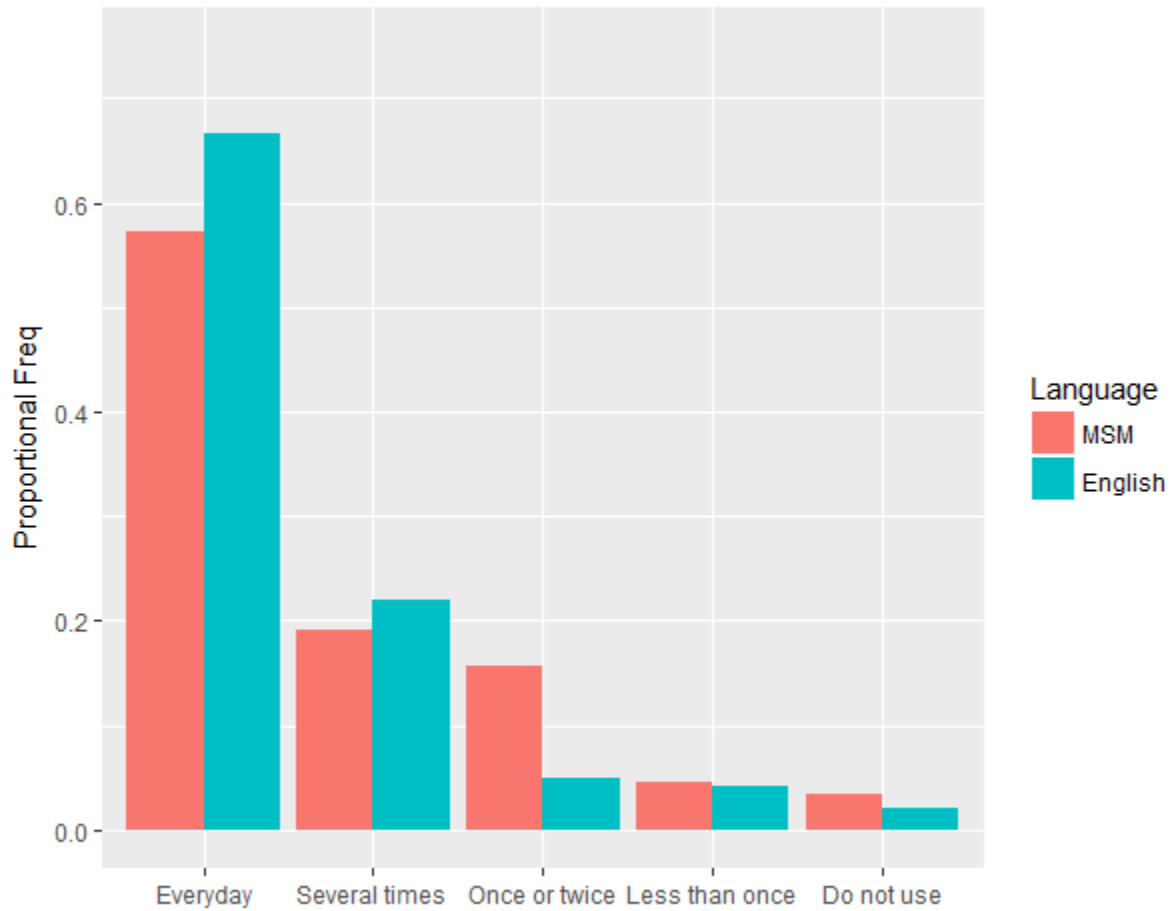


Figure 3.14a: Relative frequency of Internet consumption for political news, MSM v V2 English comparison

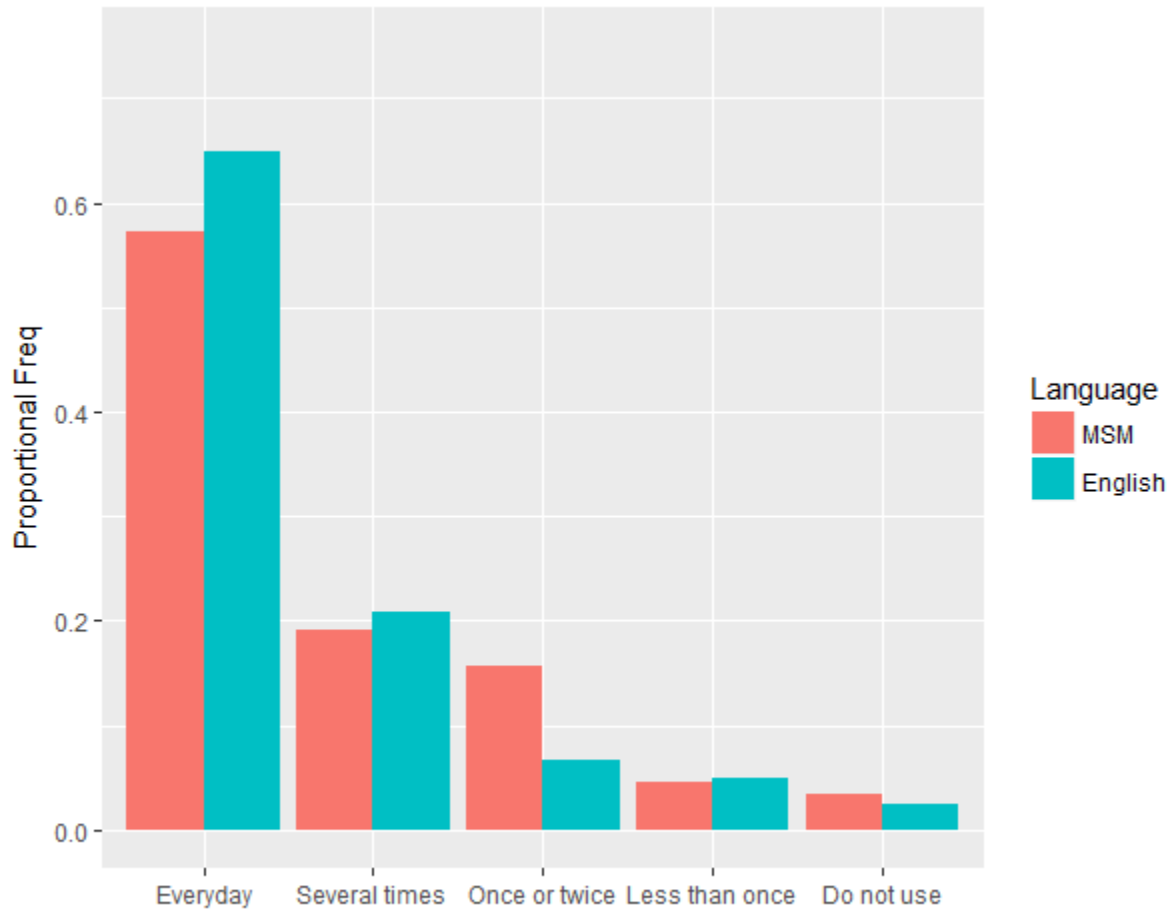


Figure 3.14b: Relative frequency of Internet consumption for political news, MSM v Pooled English comparison

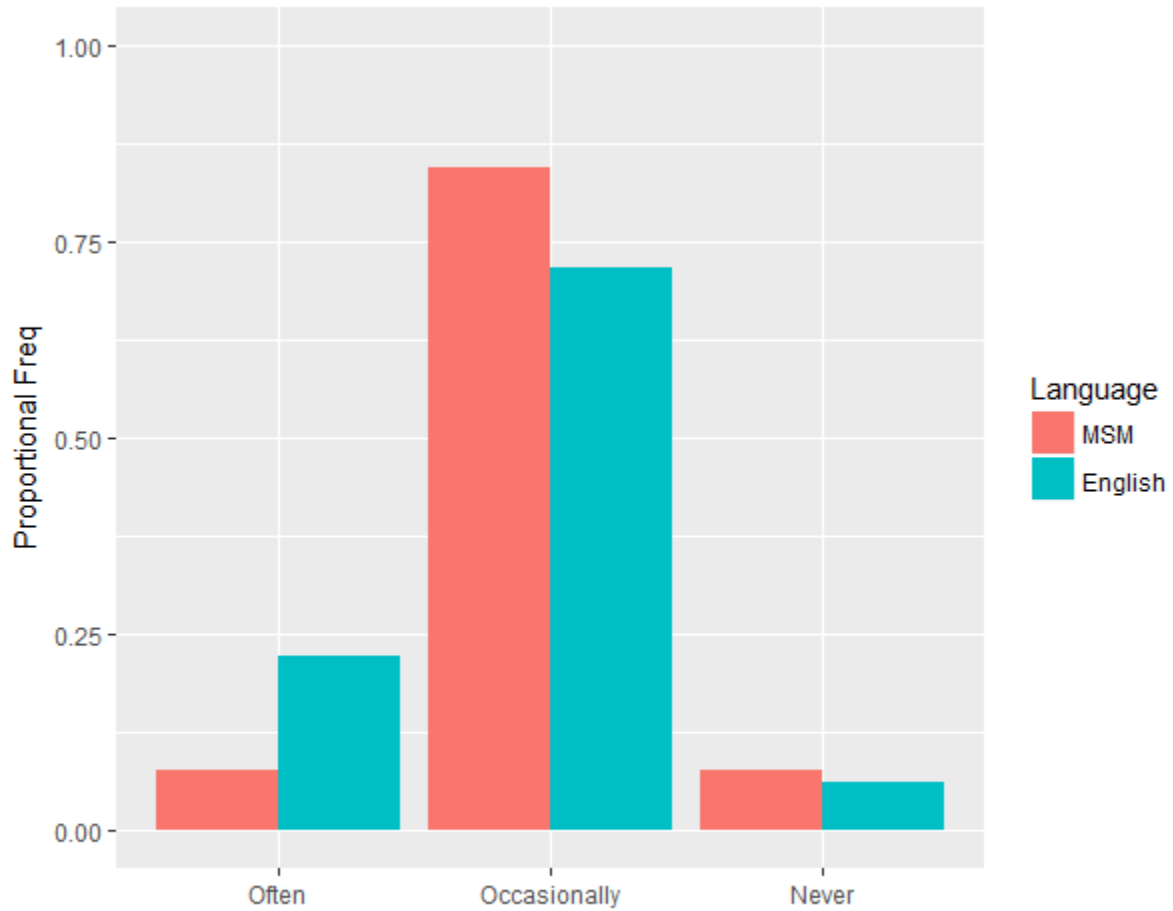


Figure 3.15a: Relative frequency of political discussion with family and close friends, MSM v V2 English comparison

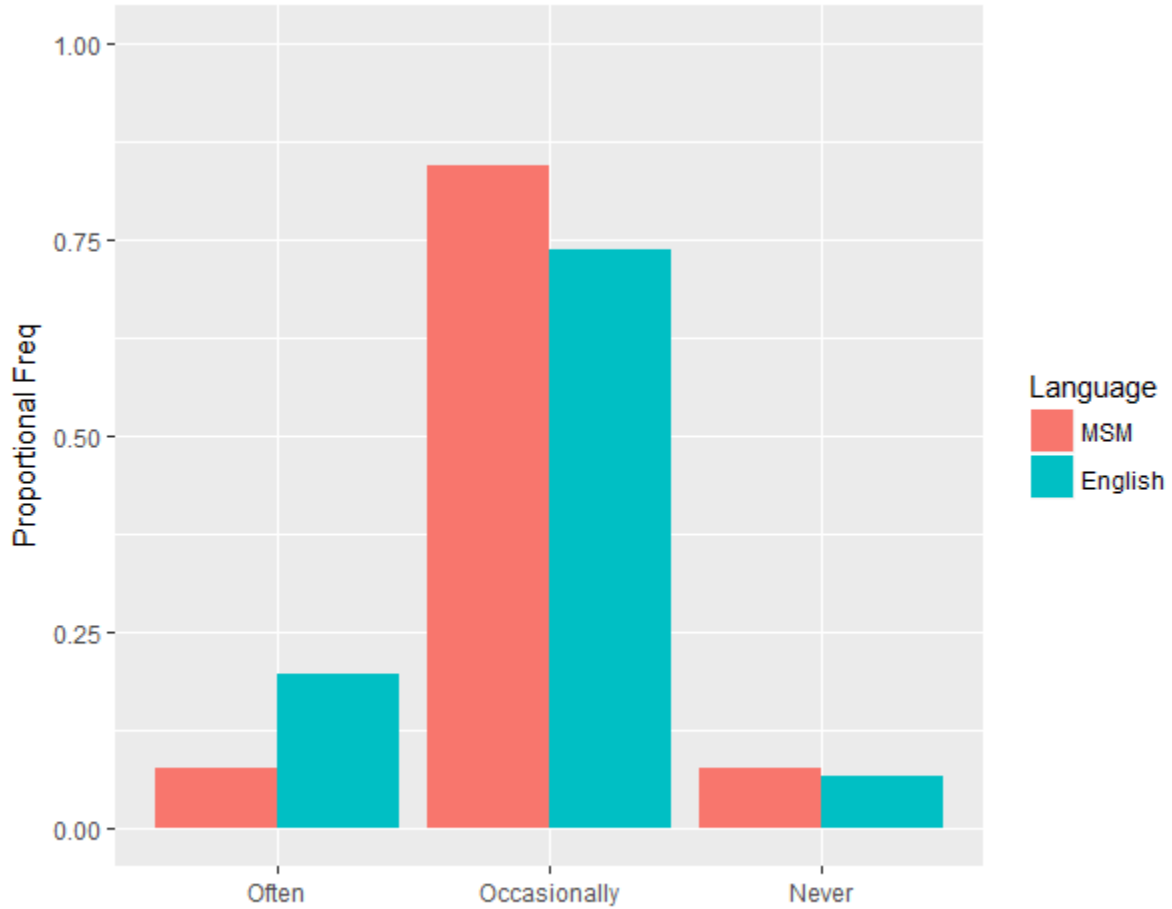


Figure 3.15b: Relative frequency of political discussion with family and close friends, MSM v Pooled English comparison

Table 3.14: Descriptive Statistics of political discussion with family and close friends			
	<i>Median</i>	<i>Mean</i>	<i>Std. Dev.</i>
<i>MSM</i>	2	2.00	0.394
<i>V2 English</i>	2	1.84	0.510
English Pooled	2	1.87	0.496

Table 3.15a: Mann-Whitney's U Test Results for Differences in Response Distributions of News Consumption and Discussion, V2 English Samples

	<i>MSM Median</i>	<i>English Median</i>	<i>U</i>	<i>p</i>		<i>diff in means (t-test p)</i>	η^2	<i>Cohen's D</i>
<i>Newspaper</i>	4	4	5133	0.096		0.065	0.014	0.249
<i>Television</i>	3	3	7840.5	0.000		0.000	0.070	0.566
<i>Radio</i>	4	4	6175	0.448		0.419	0.003	0.114
<i>Internet</i>	1	1	5533	0.080		0.082	0.014	0.245
<i>Discussion</i>	2	2	5631.5	0.010	+	0.008	0.030	0.339

* Exact *p* could not be computed due to ties. Significance checked with independent-sample *t*-test and OLS

+ Heterogeneous variance, $p < 0.05$

Table 3.15b: Mann-Whitney's U Test Results for Differences in Response Distributions of News Consumption and Discussion, Pooled English Samples

	<i>MSM Median</i>	<i>English Median</i>	<i>U</i>	<i>p</i>		<i>diff in means (t-test p)</i>	η^2	<i>Cohen's D</i>
<i>Newspaper</i>	4	4	9071.5	0.356		0.247	0.004	0.142
<i>Television</i>	3	3	11813	0.007		0.005	0.020	0.358
<i>Radio</i>	4	4	10235	0.395		0.470	0.002	0.092
<i>Internet</i>	2	1	9660.5	0.139		0.171	0.006	0.178
<i>Discussion</i>	2	2	9758	0.021	+	0.013	0.015	0.279

* Exact *p* could not be computed due to ties. Significance checked with independent-sample *t*-test and OLS

+ Heterogeneous variance, $p < 0.05$

Table 4.1a: Factor analysis on attitudes using pooled data, N=429

	<i>Factor 1</i>	<i>Factor 2</i>
<i>A. Yield to parental demands</i>	0.689	
<i>B. Do not question teacher authority</i>	0.722	-0.108
<i>C. Yield to neighbor in conflict</i>	0.520	0.175
<i>D. Subordinate personal interest for family</i>		0.431
<i>E. Follow own beliefs</i>		0.147
<i>F. No open political conflicts</i>	0.268	0.249
<i>G. Support government even if disagree</i>	0.435	0.246

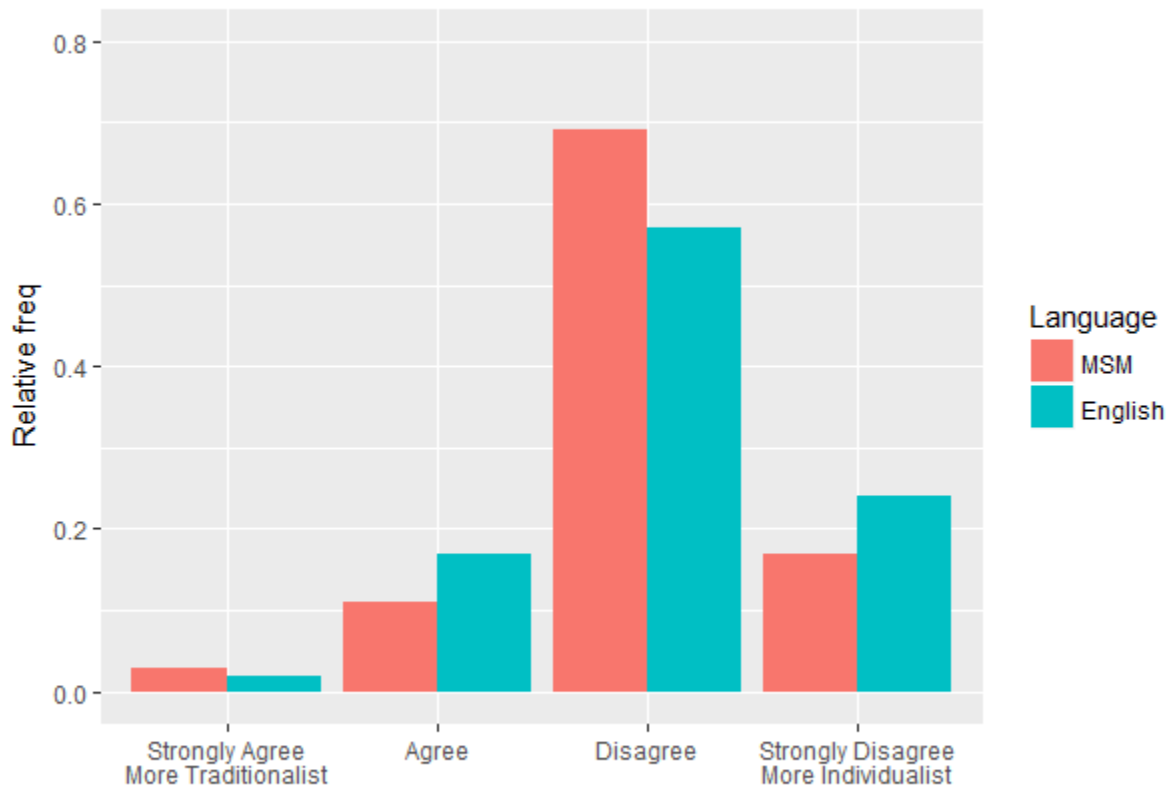
Table 4.1b: Factor analysis on attitudes using MSM-language data, N=219

	<i>Factor 1</i>	<i>Factor 2</i>
<i>A. Yield to parental demands</i>	0.656	0.159
<i>B. Do not question teacher authority</i>	0.805	
<i>C. Yield to neighbor in conflict</i>	0.532	0.225
<i>D. Subordinate personal interest for family</i>		0.441
<i>E. Follow own beliefs</i>		0.150
<i>F. No open political conflicts</i>	0.220	0.338
<i>G. Support government even if disagree</i>	0.333	0.506

Table 4.1c: Factor analysis on attitudes using English-language data, N=210

	<i>Factor 1</i>	<i>Factor 2</i>
<i>A. Yield to parental demands</i>	0.720	
<i>B. Do not question teacher authority</i>	0.644	-0.101
<i>C. Yield to neighbor in conflict</i>	0.498	
<i>D. Subordinate personal interest for family</i>		0.572
<i>E. Follow own beliefs</i>		0.167
<i>F. No open political conflicts</i>	0.300	0.125
<i>G. Support government even if disagree</i>	0.501	0.142

Figure 4.1: Relative frequency distribution for Traditionalism Battery, item A



Even if parents' demands are unreasonable,
children should still do what they ask.

Figure 4.2: Relative frequency distribution for Traditionalism Battery, item B

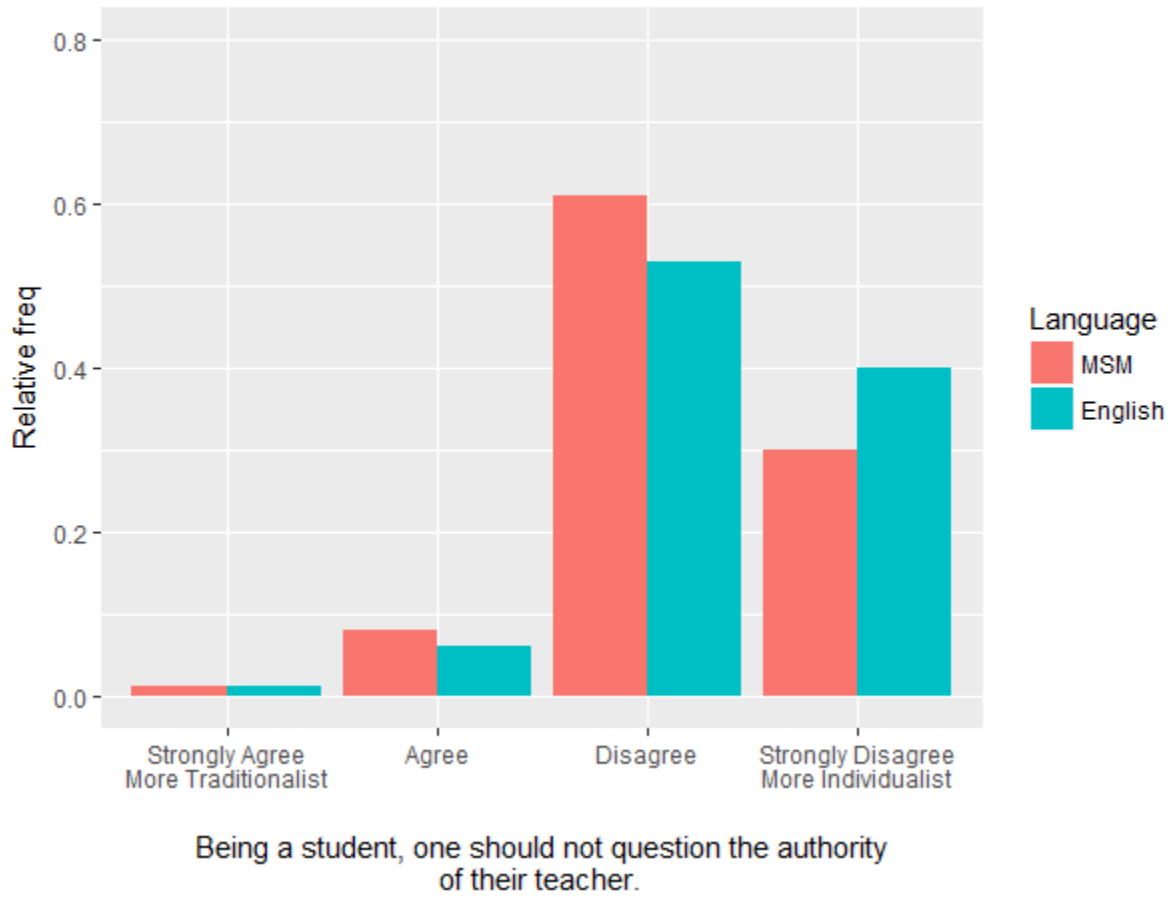
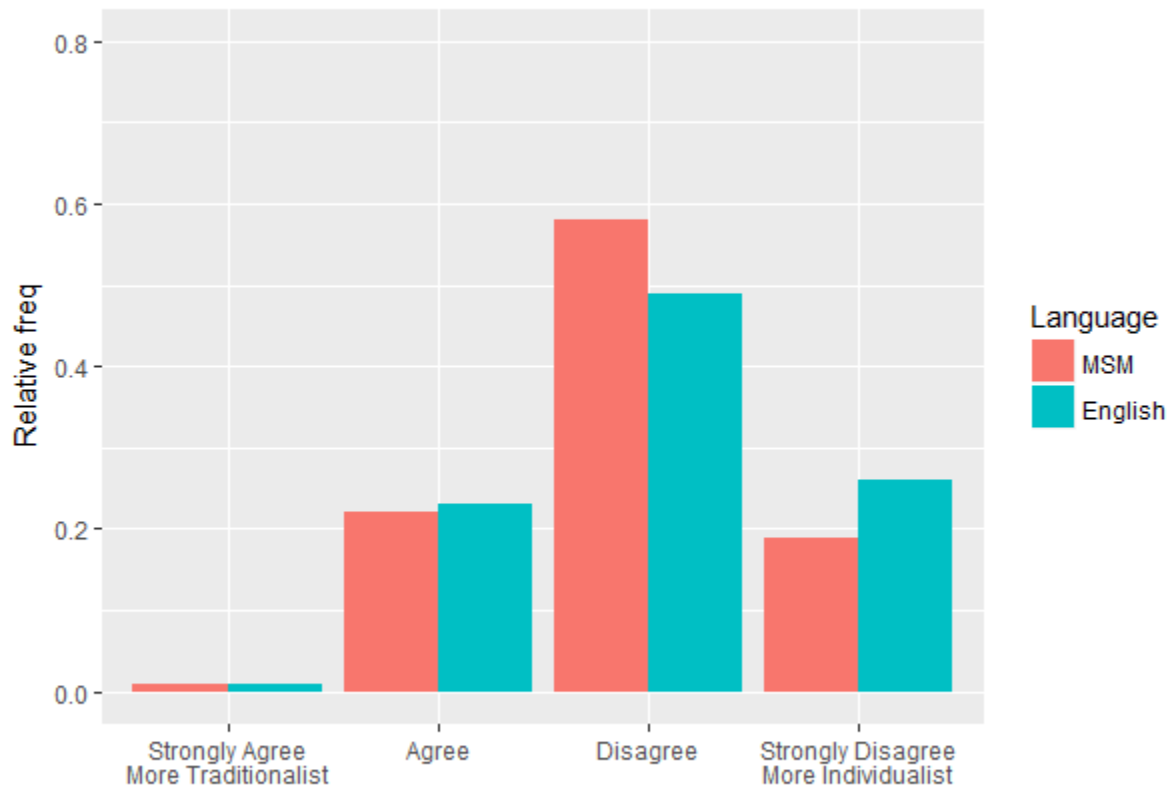
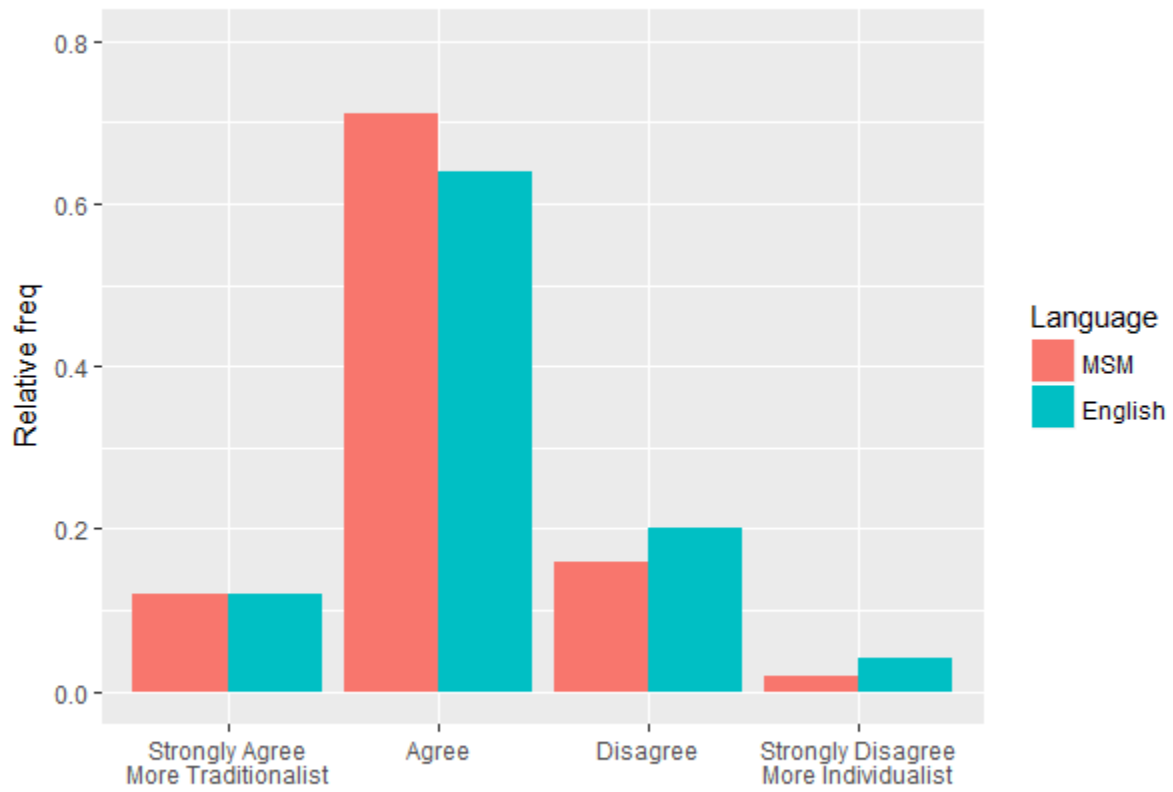


Figure 4.3: Relative frequency distribution for Traditionalism Battery, item C



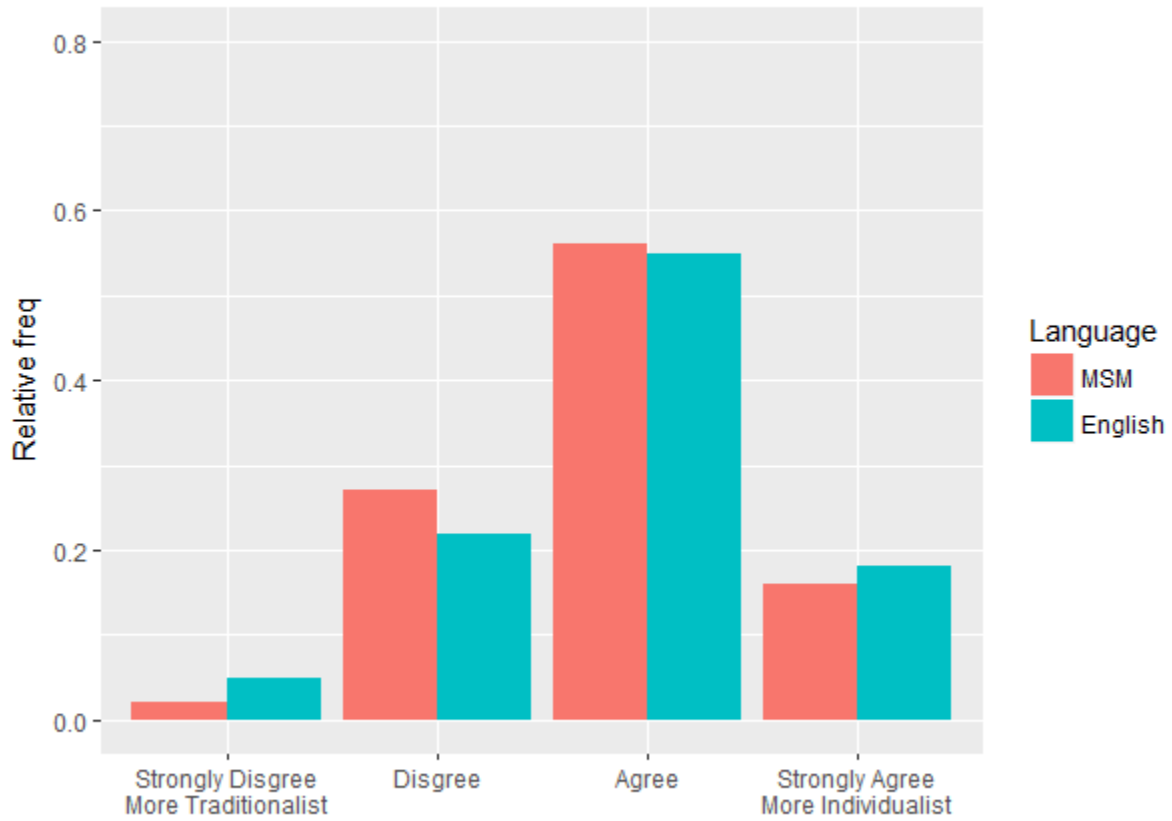
When one has a conflict with a neighbor,
the best way to deal with it is to yield to the other person.

Figure 4.4: Relative frequency distribution for Traditionalism Battery, item D



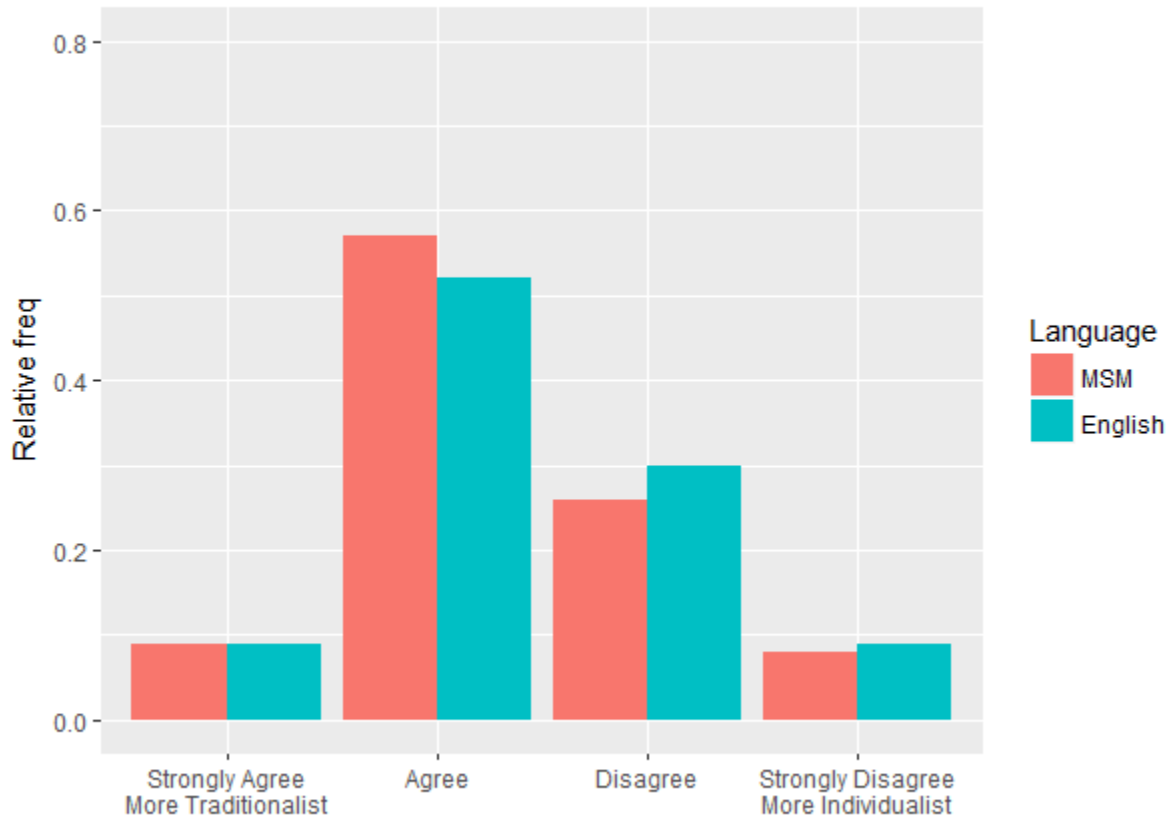
For the sake of the family,
the individual should put his personal interests second.

Figure 4.5: Relative frequency distribution for Traditionalism Battery, item E



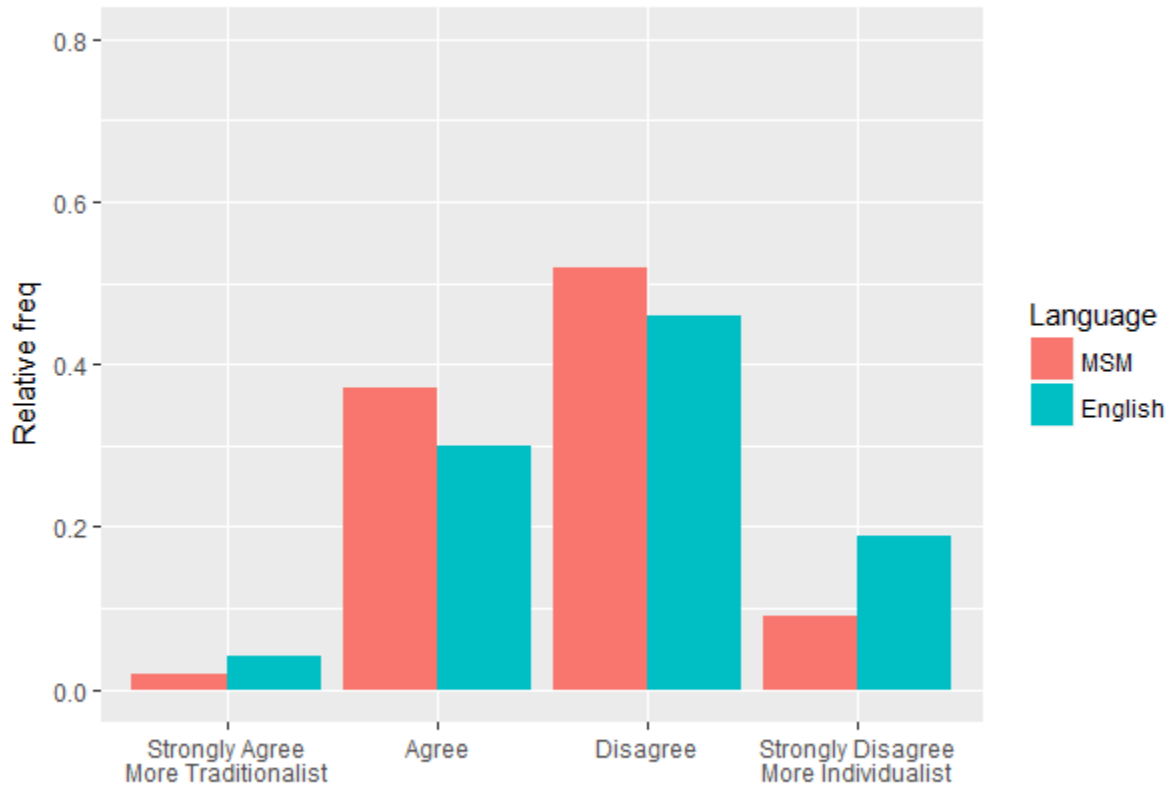
Sometimes one has to follow one's own beliefs regardless of what other people think.

Figure 4.6: Relative frequency distribution for Traditionalism Battery, item F



Open conflicts among politicians are harmful to society.

Figure 4.7: Relative frequency distribution for Traditionalism Battery, item G



G. People should always support the decisions of their government even if they disagree with them.

Table 4.2: Fisher's Exact Test for independence of response distributions by language group for the Traditionalism battery

	<i>p</i>
<i>A. Even though parental demands may be unreasonable, children should still do as they're told</i>	0.03
<i>B. Being a student, one should not question the authority of their teacher</i>	0.23
<i>C. When one has a conflict with a neighbor, the best way to deal with it is to yield to the other person</i>	0.24
<i>D. For the sake of the family, the individual should put his personal interests second</i>	0.31
<i>E. Sometimes one has to follow one's own beliefs regardless of what other people thinks</i>	0.18
<i>F. Open conflict among politicians are harmful to society</i>	0.70
<i>G. People should always support the decisions of their government even if they disagree with them</i>	0.01

Table 4.3: Descriptive statistics by language group by question, Traditionalism battery

	<i>MSM median</i>	<i>MSM mean</i>	<i>SD</i>	<i>English median</i>	<i>English mean</i>	<i>SD</i>
<i>A. Even though parental demands may be unreasonable, children should still do as they're told</i>	3	3.00	0.637	3	3.03	0.712
<i>B. Being a student, one should not question the authority of their teacher</i>	3	3.20	0.631	3	3.32	0.632
<i>C. When one has a conflict with a neighbor, the best way to deal with it is to yield to the other person</i>	3	2.95	0.680	3	3.00	0.745
<i>D. For the sake of the family, the individual should put his personal interests second</i>	2	2.07	0.587	2	2.16	0.672
<i>E. Sometimes one has to follow one's own beliefs regardless of what other people thinks</i>	2	2.15	0.692	2	2.15	0.767
<i>F. Open conflict among politicians are harmful to society</i>	2	2.32	0.750	2	2.40	0.772
<i>G. People should always support the decisions of their government even if they disagree with them</i>	3	2.68	0.670	3	2.80	0.793

Table 4.4: Test for independence of response distributions by language group for the Traditionalism battery

	Independent-sample t-test		Mann Whitney's U Test		η^2
	<i>t</i> -statistic	<i>p</i>	<i>U</i>	<i>p</i>	
<i>A. Even though parental demands may be unreasonable, children should still do as they're told</i>	0.44	0.662	23394	0.647	
<i>B. Being a student, one should not question the authority of their teacher</i>	1.94	0.053	25054	0.043	0.009
<i>C. When one has a conflict with a neighbor, the best way to deal with it is to yield to the other person</i>	0.80	0.425	23638	0.403	0.002
<i>D. For the sake of the family, the individual should put his personal interests second</i>	1.45	0.148	24326	0.176	0.005
<i>E. Sometimes one has to follow one's own beliefs regardless of what other people thinks</i>	-0.04	0.966	22360	0.714	
<i>F. Open conflict among politicians are harmful to society</i>	1.01	0.313	23916	0.280	0.002
<i>G. People should always support the decisions of their government even if they disagree with them</i>	1.75	0.080	24903	0.070	0.007

Table 4.5a: Factor analysis on attitudes using pooled data, female respondents

	<i>Factor 1</i>	<i>Factor 2</i>
<i>A. Yield to parental demands</i>	0.683	
<i>B. Do not question teacher authority</i>	0.714	-0.131
<i>C. Yield to neighbor in conflict</i>	0.539	0.239
<i>D. Subordinate personal interest for family</i>		0.381
<i>E. Follow own beliefs</i>		0.109
<i>F. No open political conflicts</i>	0.188	0.221
<i>G. Support government even if disagree</i>	0.397	0.503

Table 4.5b: Factor analysis on attitudes using MSM-language data, female respondents

	<i>Factor 1</i>	<i>Factor 2</i>
<i>A. Yield to parental demands</i>	0.616	
<i>B. Do not question teacher authority</i>	0.827	-0.234
<i>C. Yield to neighbor in conflict</i>	0.530	0.194
<i>D. Subordinate personal interest for family</i>		0.376
<i>E. Follow own beliefs</i>		0.143
<i>F. No open political conflicts</i>	0.185	0.290
<i>G. Support government even if disagree</i>	0.365	0.536

Table 4.5c: Factor analysis on attitudes using English-language data, female respondents

	<i>Factor 1</i>	<i>Factor 2</i>
<i>A. Yield to parental demands</i>	0.710	
<i>B. Do not question teacher authority</i>	0.597	
<i>C. Yield to neighbor in conflict</i>	0.585	
<i>D. Subordinate personal interest for family</i>	0.119	
<i>E. Follow own beliefs</i>		
<i>F. No open political conflicts</i>	0.260	
<i>G. Support government even if disagree</i>	0.496	

Table 4.6a: Factor analysis on attitudes using pooled data, male respondents, N=90

	<i>Factor 1</i>	<i>Factor 2</i>
<i>A. Yield to parental demands</i>	0.752	
<i>B. Do not question teacher authority</i>	0.691	
<i>C. Yield to neighbor in conflict</i>	0.456	
<i>D. Subordinate personal interest for family</i>	0.196	
<i>E. Follow own beliefs</i>		
<i>F. No open political conflicts</i>	0.516	
<i>G. Support government even if disagree</i>	0.574	

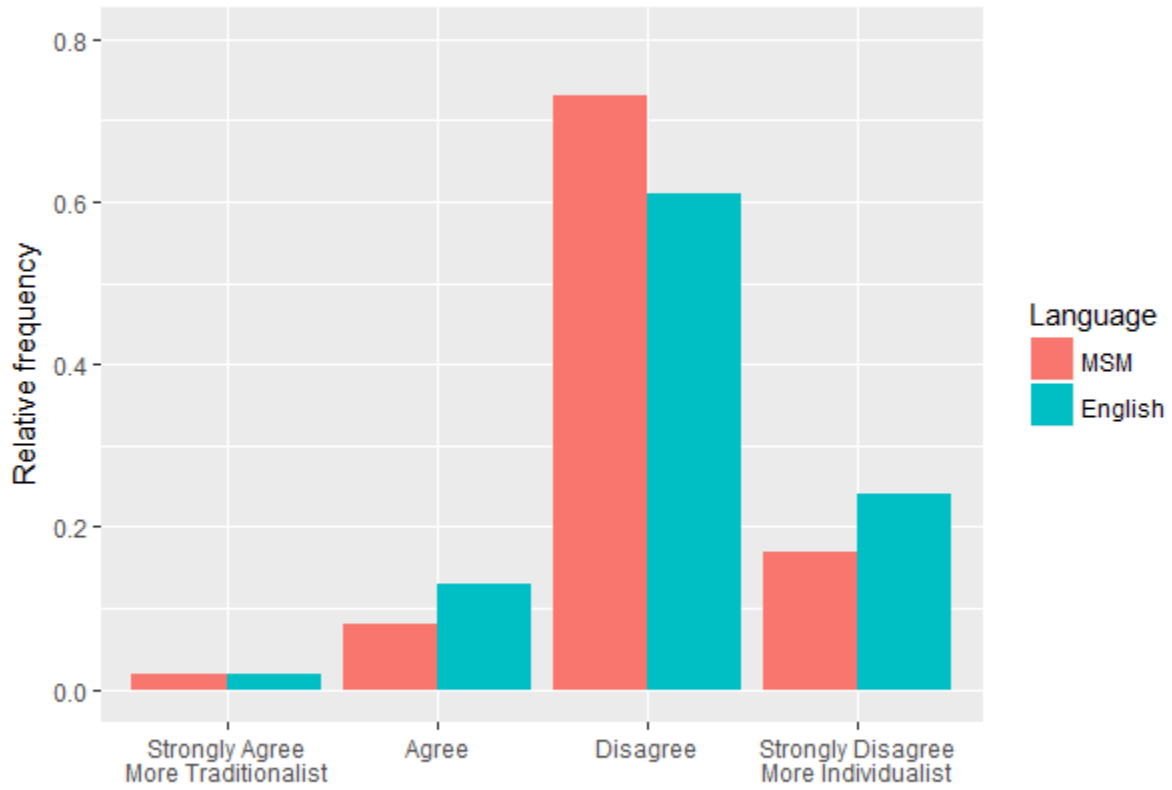
Table 4.6b: Factor analysis on attitudes using MSM-language data, male respondents, N=42

	<i>Factor 1</i>	<i>Factor 2</i>
<i>A. Yield to parental demands</i>	0.784	
<i>B. Do not question teacher authority</i>	0.644	
<i>C. Yield to neighbor in conflict</i>	0.674	
<i>D. Subordinate personal interest for family</i>	0.453	
<i>E. Follow own beliefs</i>	0.116	
<i>F. No open political conflicts</i>	0.515	
<i>G. Support government even if disagree</i>	0.493	

Table 4.6c: Factor analysis on attitudes using English-language data, male respondents

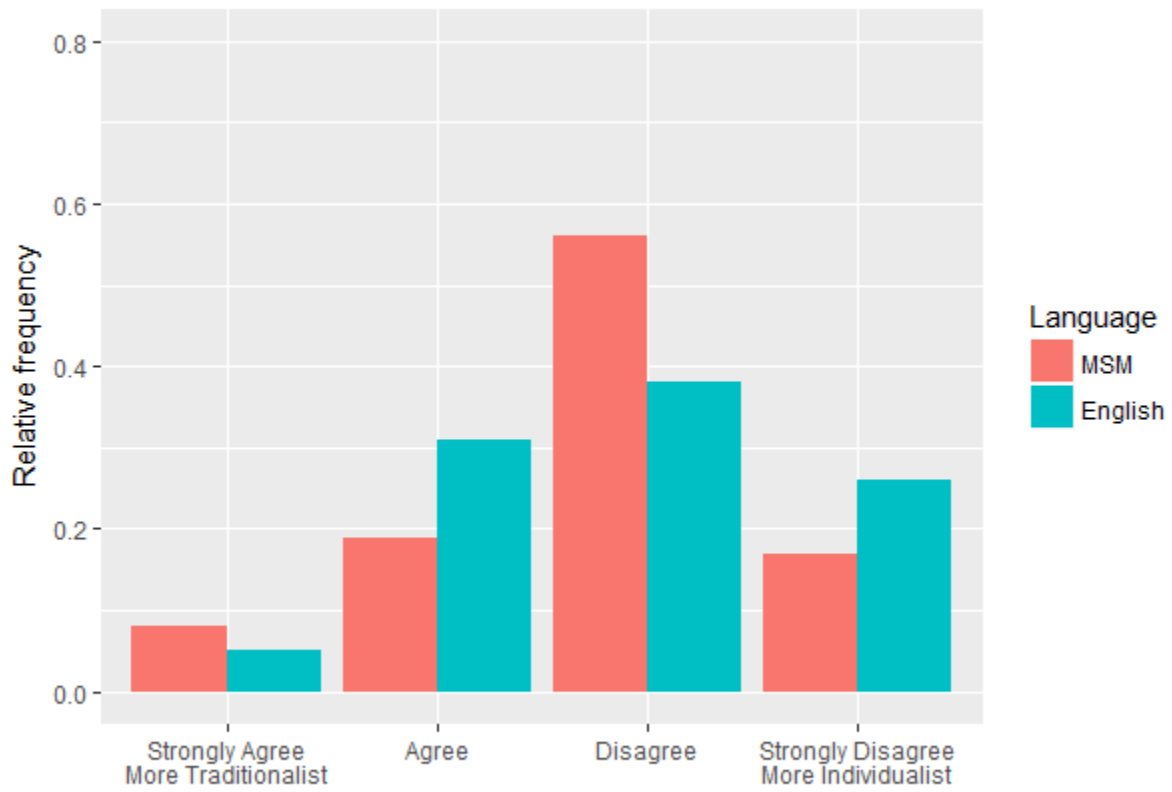
	<i>Factor 1</i>	<i>Factor 2</i>
<i>A. Yield to parental demands</i>	0.702	
<i>B. Do not question teacher authority</i>	0.776	
<i>C. Yield to neighbor in conflict</i>	0.301	
<i>D. Subordinate personal interest for family</i>		
<i>E. Follow own beliefs</i>		
<i>F. No open political conflicts</i>	0.449	
<i>G. Support government even if disagree</i>	0.652	

Figure 4.8a: Relative frequency distribution for Traditionalism Battery, item A, female respondents only



Even if parents' demands are unreasonable,
children should still do what they ask.

Figure 4.8b: Relative frequency distribution for Traditionalism Battery, item A, male respondents only



Even if parents' demands are unreasonable,
children should still do what they ask.

Figure 4.9a: Relative frequency distribution for Traditionalism Battery, item B, female respondents only

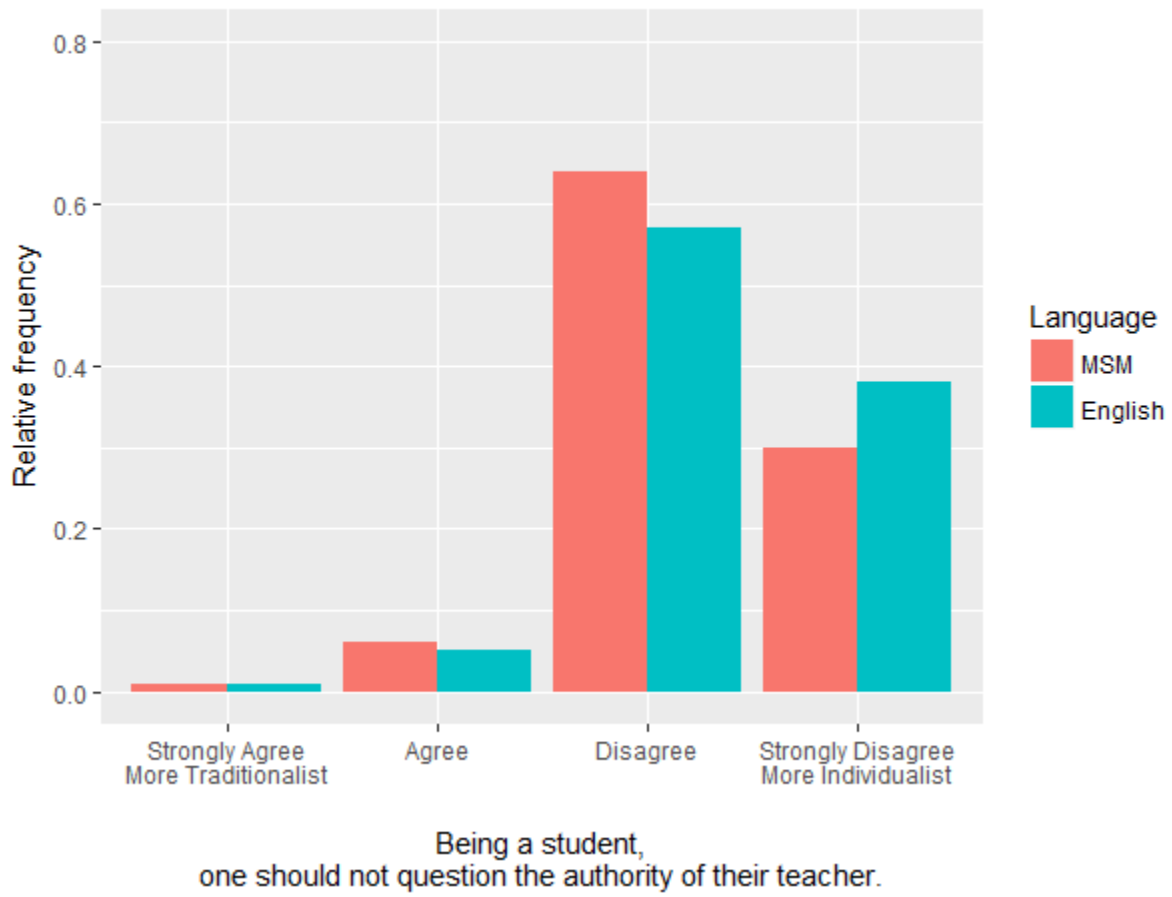


Figure 4.9b: Relative frequency distribution for Traditionalism Battery, item B, male respondents only

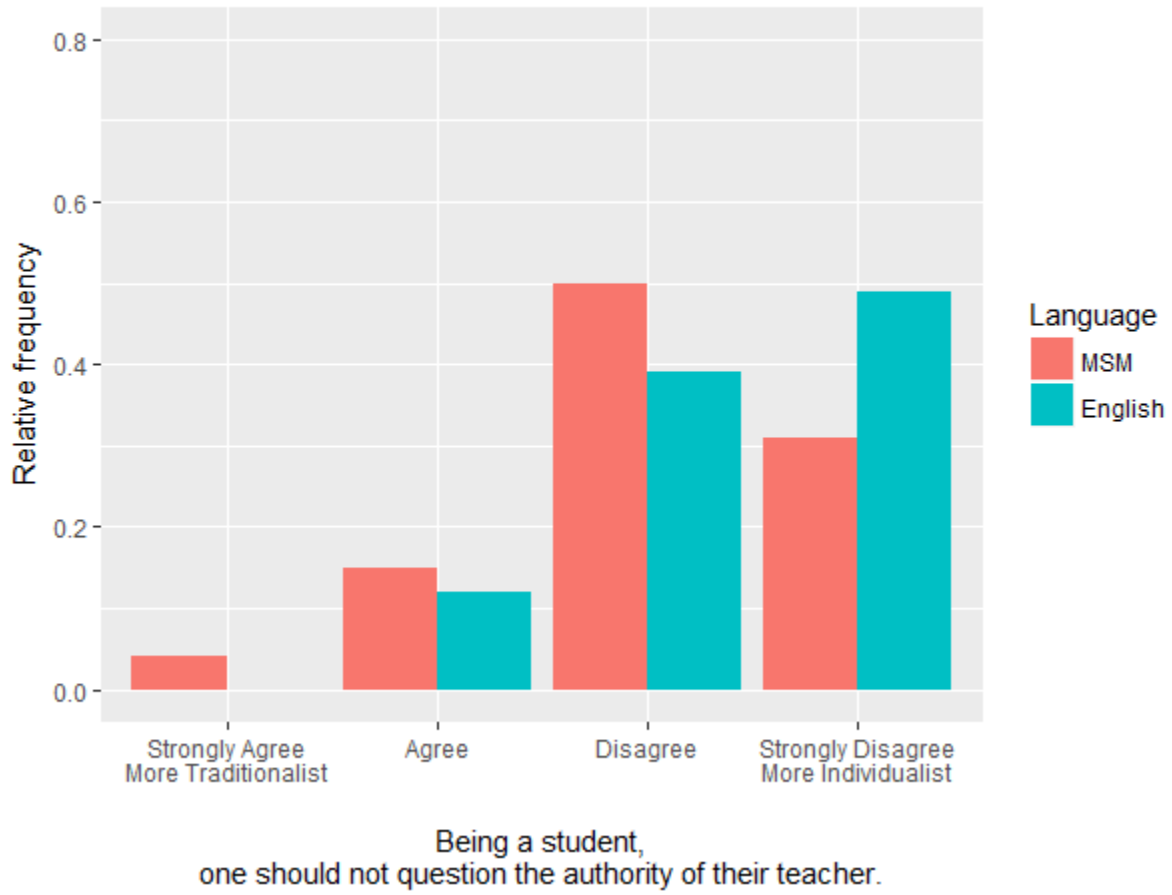
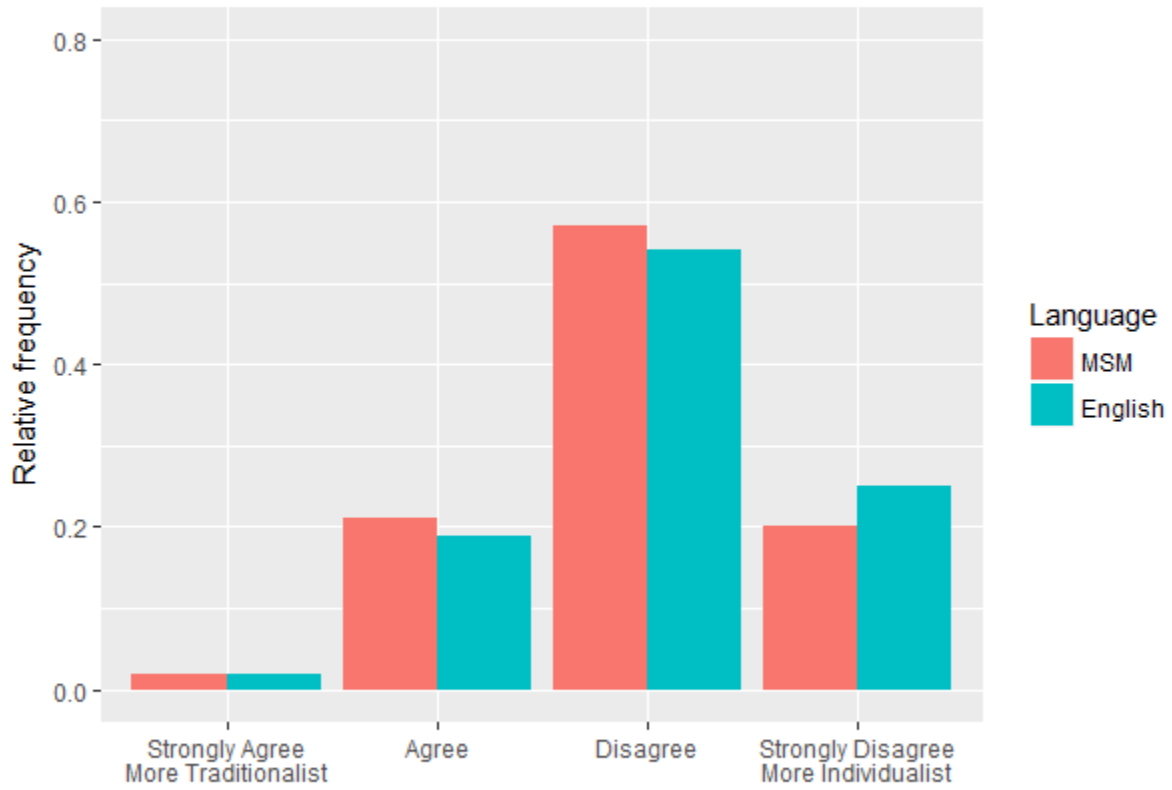
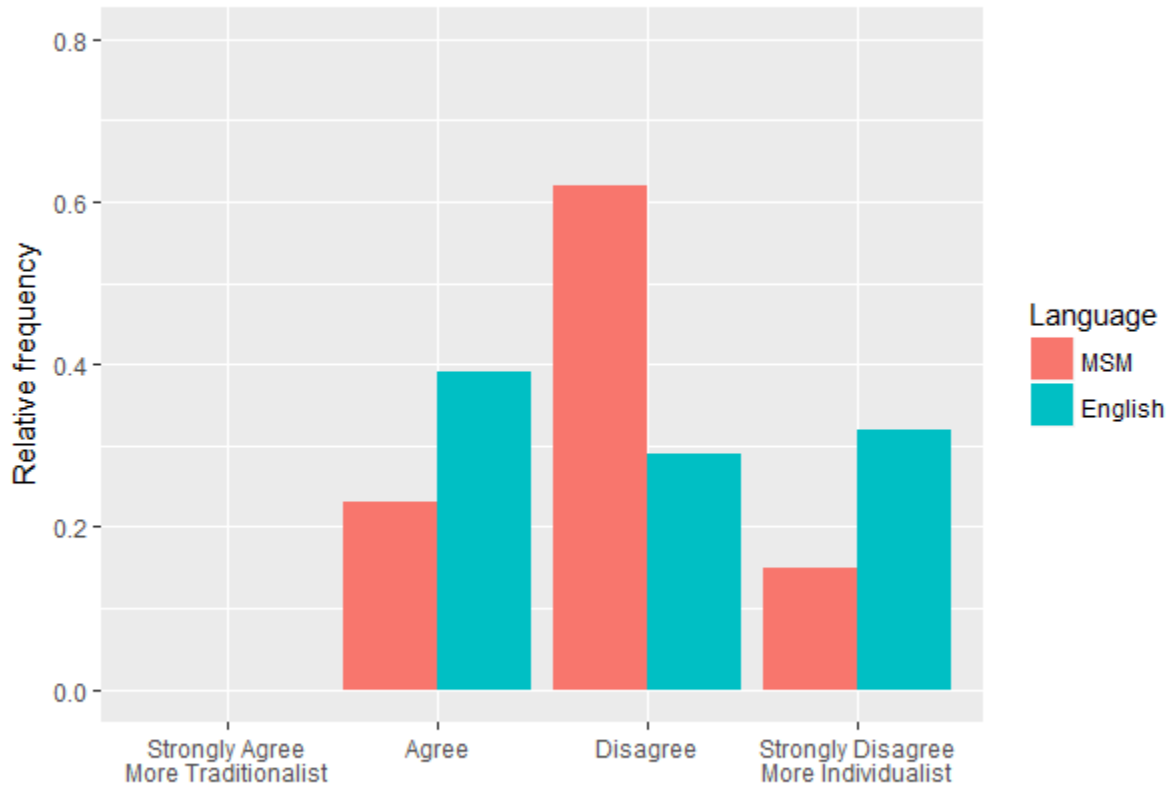


Figure 4.10a: Relative frequency distribution for Traditionalism Battery, item C, female respondents only



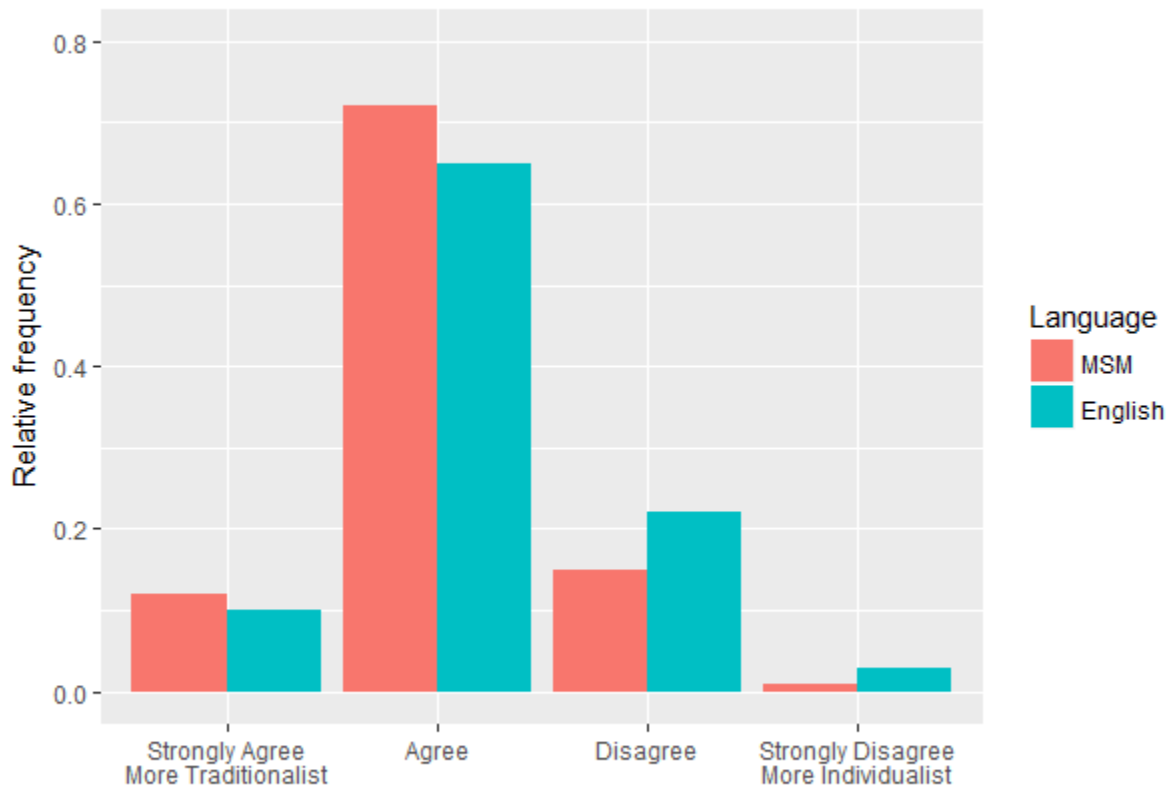
When one has a conflict with a neighbor,
the best way to deal with it is to yield to the other person.

Figure 4.10b: Relative frequency distribution for Traditionalism Battery, item C, male respondents only



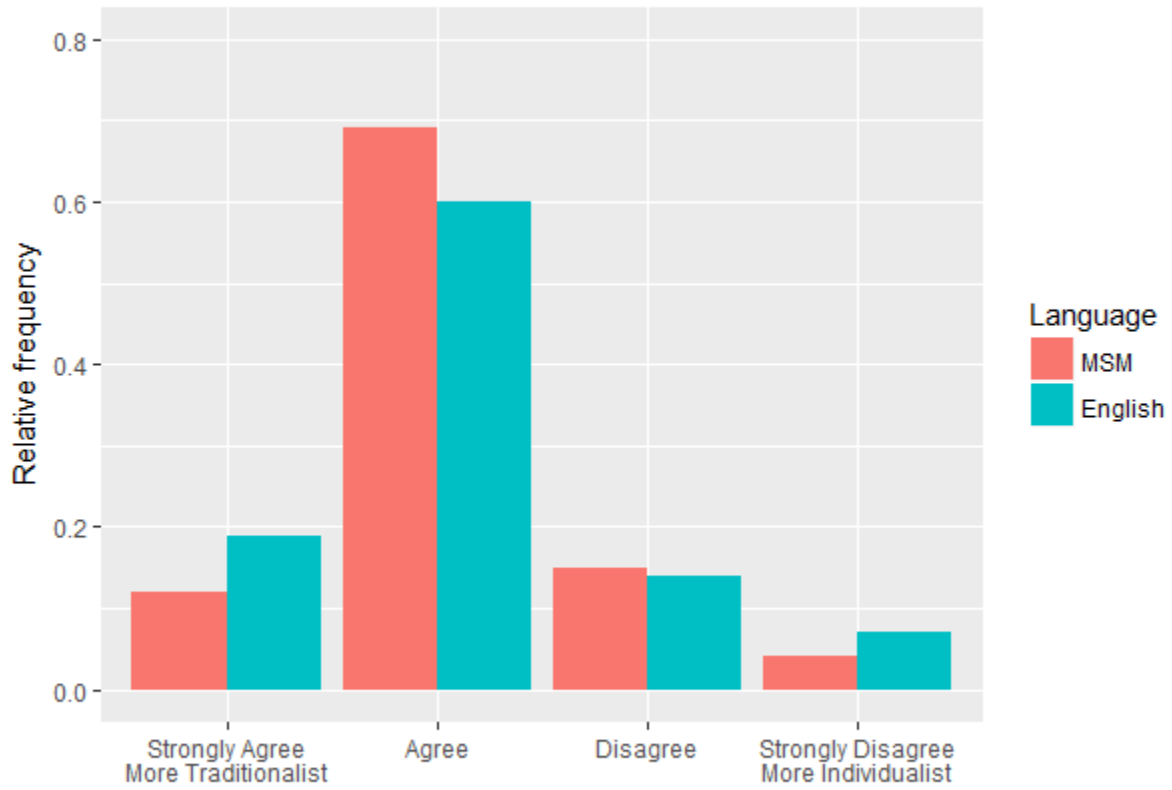
When one has a conflict with a neighbor,
the best way to deal with it is to yield to the other person.

Figure 4.11a: Relative frequency distribution for Traditionalism Battery, item D, female respondents only



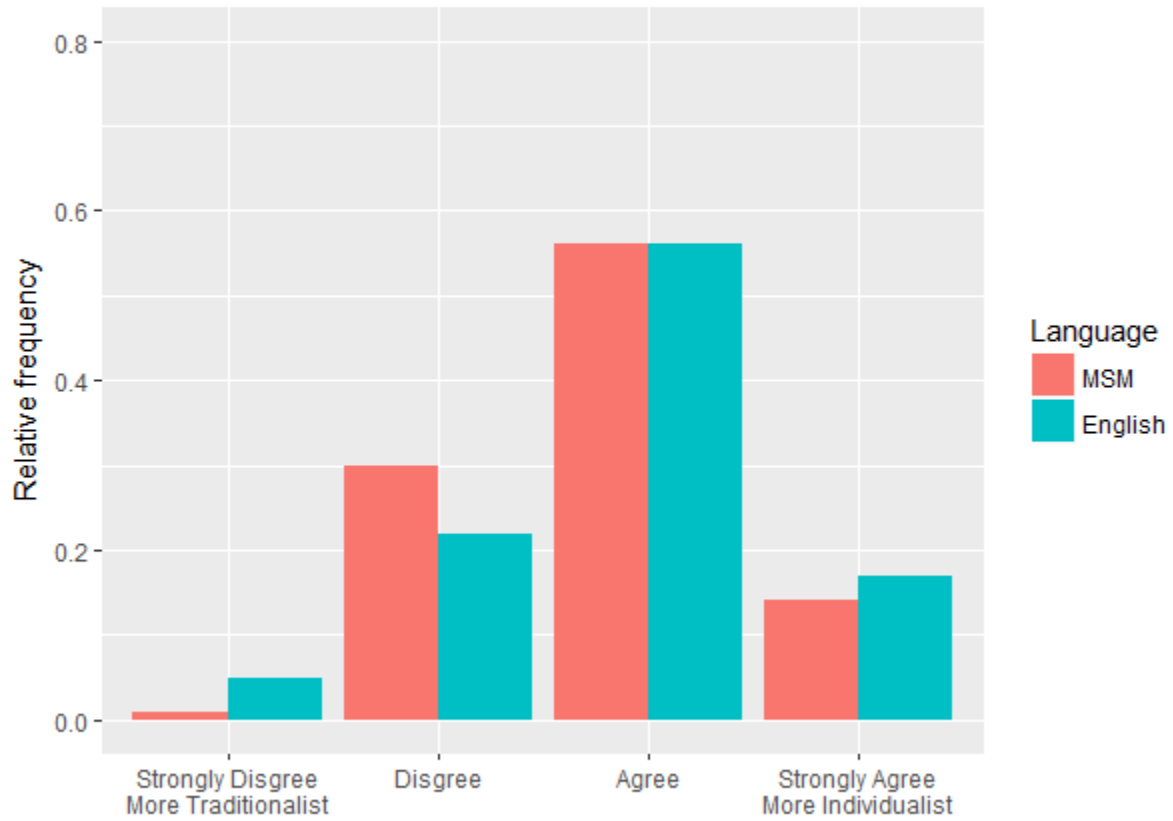
For the sake of the family,
the individual should put his personal interests second.

Figure 4.11b: Relative frequency distribution for Traditionalism Battery, item D, male respondents only



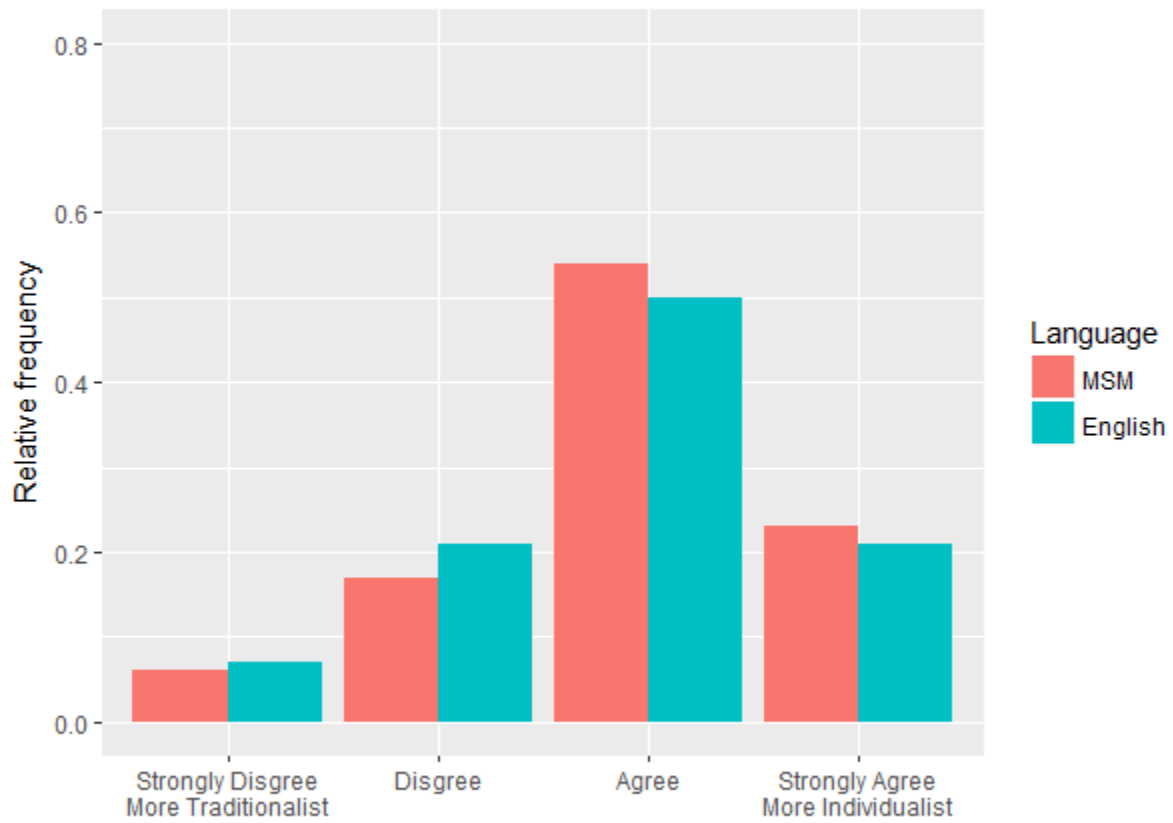
For the sake of the family,
the individual should put his personal interests second.

Figure 4.12a: Relative frequency distribution for Traditionalism Battery, item E, female respondents only



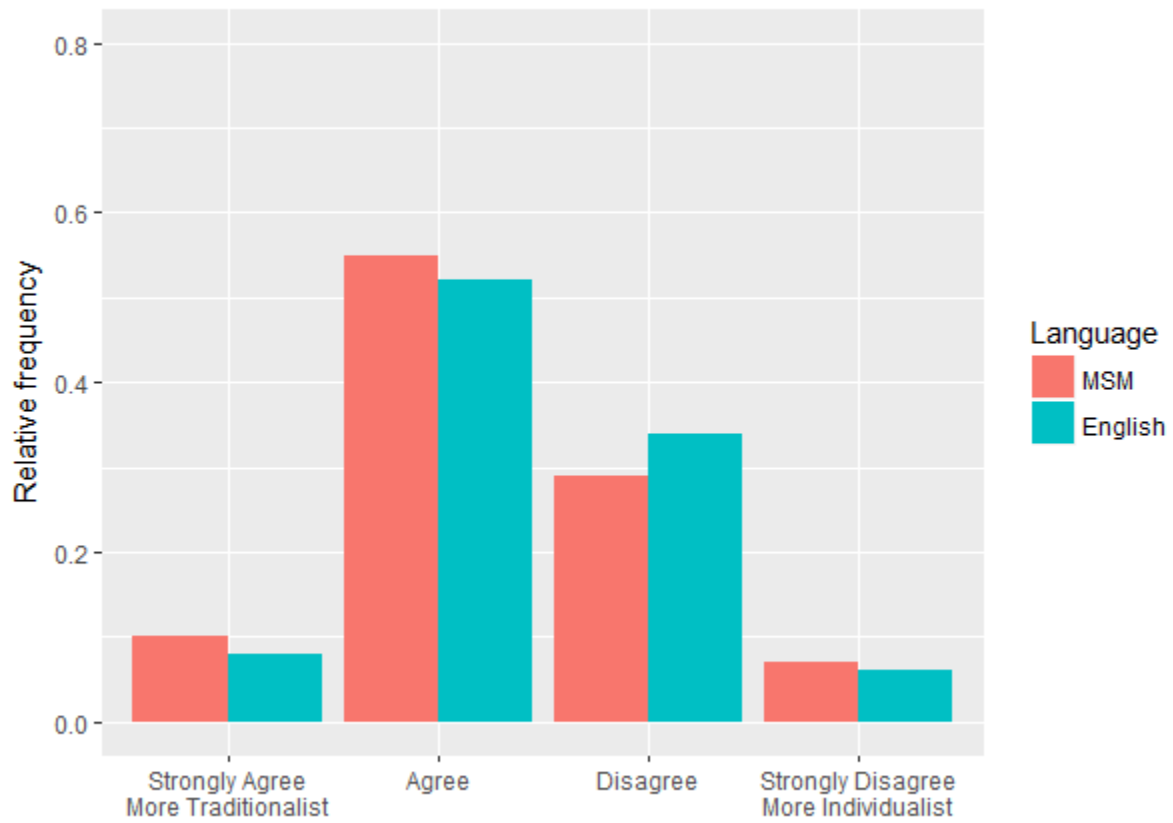
Sometimes one has to follow one's own beliefs regardless of what other people think.

Figure 4.12b: Relative frequency distribution for Traditionalism Battery, item E, male respondents only



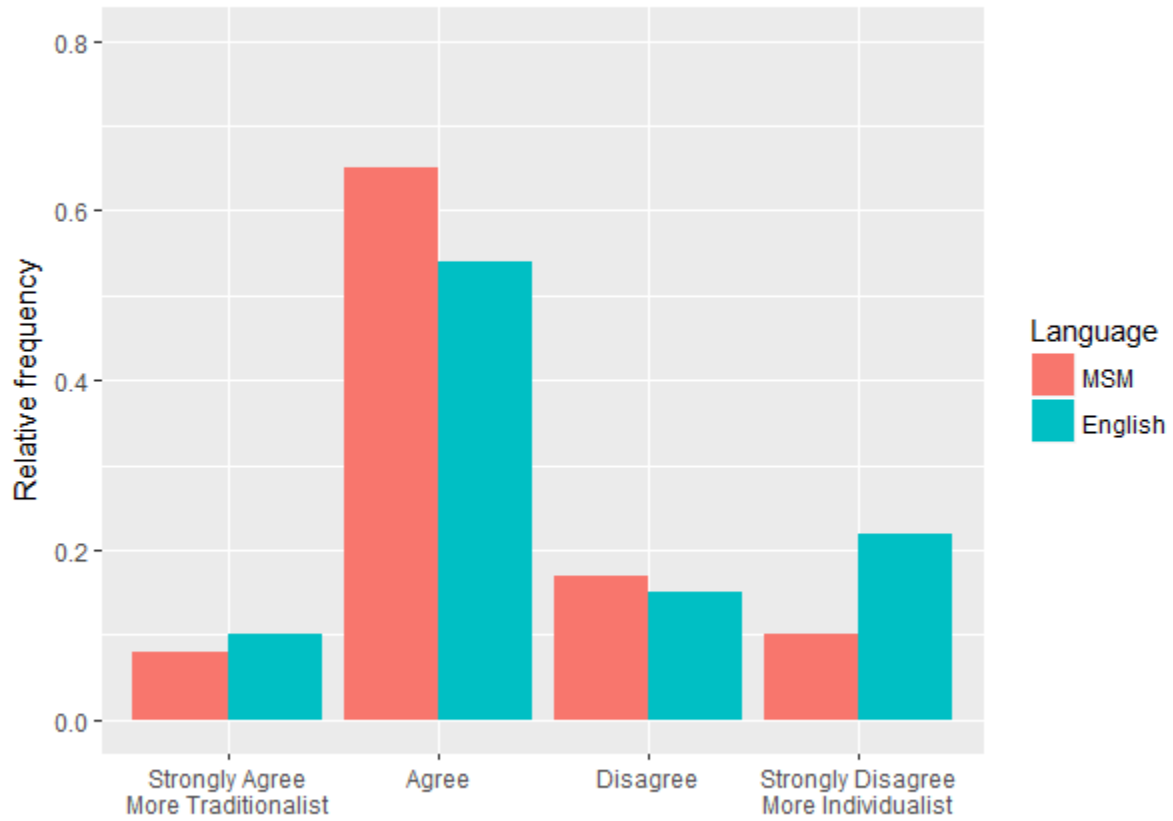
Sometimes one has to follow one's own beliefs regardless of what other people think.

Figure 4.13a: Relative frequency distribution for Traditionalism Battery, item F, female respondents only



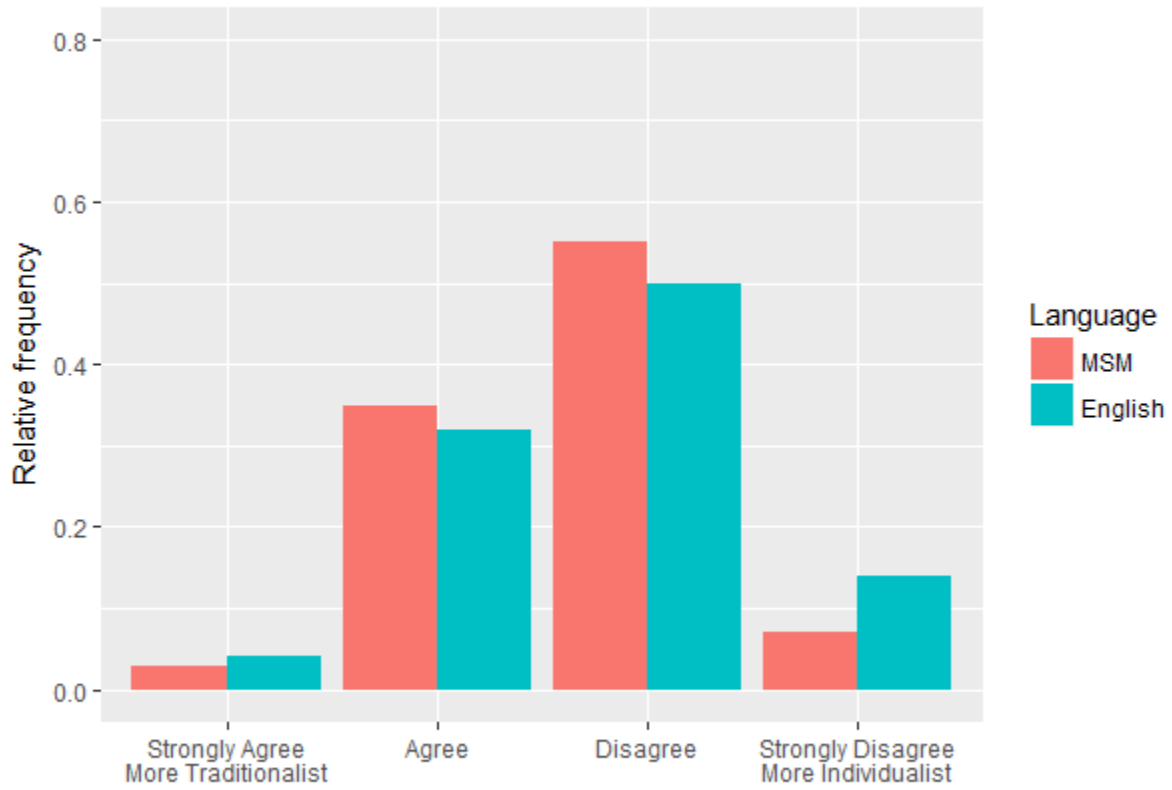
Open conflicts among politicians are harmful to society.

Figure 4.13b: Relative frequency distribution for Traditionalism Battery, item F, male respondents only



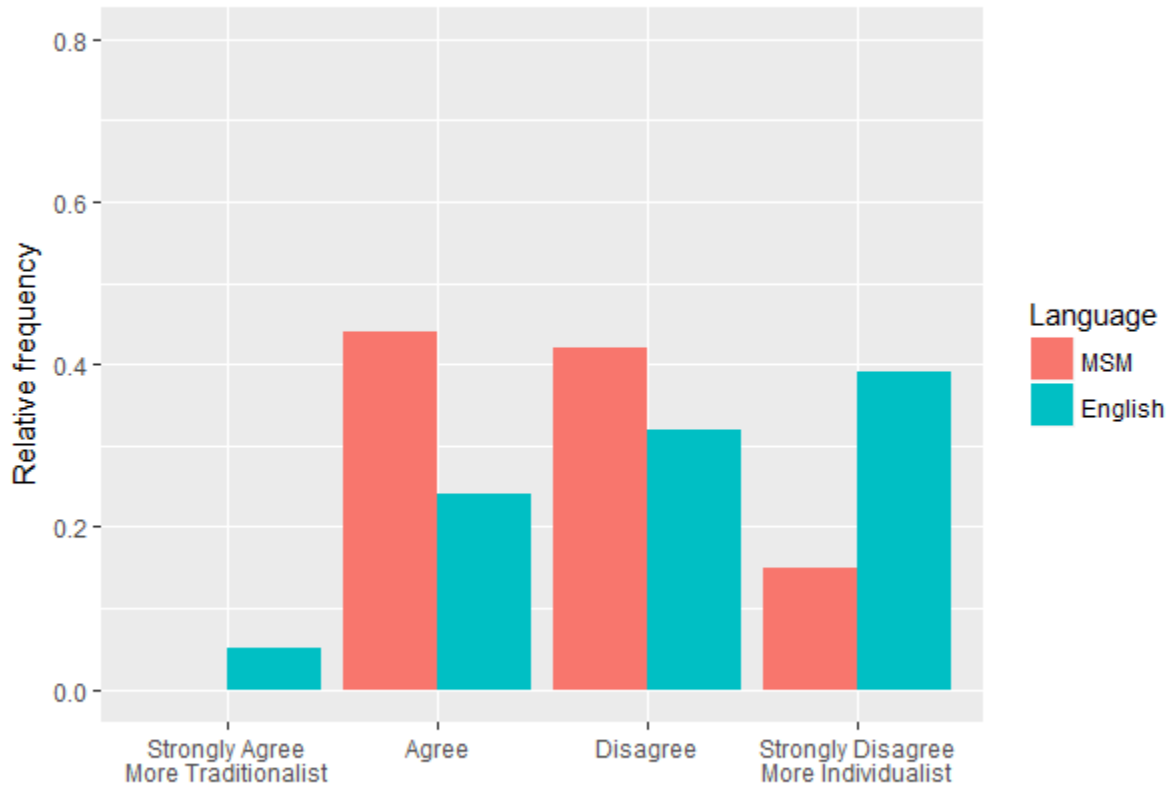
Open conflicts among politicians are harmful to society.

Figure 4.14a: Relative frequency distribution for Traditionalism Battery, item G, female respondents only



G. People should always support the decisions of their government even if they disagree with them.

Figure 4.14b: Relative frequency distribution for Traditionalism Battery, item G, male respondents only



G. People should always support the decisions of their government even if they disagree with them.

Table 4.7: Fisher's Exact Test for independence of response distributions by language group for the Traditionalism battery, by gender

	<i>p (female respondents)</i>	<i>p (male respondents)</i>
<i>A. Even though parental demands may be unreasonable, children should still do as they're told</i>	0.12	0.23
<i>B. Being a student, one should not question the authority of their teacher</i>	0.42	0.27
<i>C. When one has a conflict with a neighbor, the best way to deal with it is to yield to the other person</i>	0.72	0.01
<i>D. For the sake of the family, the individual should put his personal interests second</i>	0.26	0.75
<i>E. Sometimes one has to follow one's own beliefs regardless of what other people thinks</i>	0.41	0.95
<i>F. Open conflict among politicians are harmful to society</i>	0.75	0.51
<i>G. People should always support the decisions of their government even if they disagree with them</i>	0.16	0.01

Table 4.8a: Descriptive statistics by language group for the Traditionalism battery questions, female respondents, N=338

	<i>MSM median</i>	<i>MSM mean</i>	<i>SD</i>	<i>English median</i>	<i>English mean</i>	<i>SD</i>
<i>A. Even though parental demands may be unreasonable, children should still do as they're told</i>	3	3.05	0.565	3	3.07	0.662
<i>B. Being a student, one should not question the authority of their teacher</i>	3	3.22	0.574	3	3.30	0.617
<i>C. When one has a conflict with a neighbor, the best way to deal with it is to yield to the other person</i>	3	2.95	0.697	3	3.02	0.719
<i>D. For the sake of the family, the individual should put his personal interests second</i>	2	2.06	0.564	2	2.18	0.641
<i>E. Sometimes one has to follow one's own beliefs regardless of what other people thinks</i>	2	2.18	0.658	2	2.15	0.750
<i>F. Open conflict among politicians are harmful to society</i>	2	2.33	0.748	2	2.38	0.723
<i>G. People should always support the decisions of their government even if they disagree with them</i>	3	2.66	0.654	3	2.74	0.750

Table 4.8b: Descriptive statistics by language group for the Traditionalism battery questions, male respondents, N=90

	<i>MSM median</i>	<i>MSM mean</i>	<i>SD</i>	<i>English median</i>	<i>English mean</i>	<i>SD</i>
<i>A. Even though parental demands may be unreasonable, children should still do as they're told</i>	3	2.81	0.816	3	2.86	0.872
<i>B. Being a student, one should not question the authority of their teacher</i>	3	3.08	0.794	3	3.37	0.698
<i>C. When one has a conflict with a neighbor, the best way to deal with it is to yield to the other person</i>	3	2.92	0.613	3	2.93	0.848
<i>D. For the sake of the family, the individual should put his personal interests second</i>	2	2.10	0.660	2	2.10	0.790
<i>E. Sometimes one has to follow one's own beliefs regardless of what other people thinks</i>	2	2.29	0.810	2	2.14	0.843
<i>F. Open conflict among politicians are harmful to society</i>	2	2.06	0.771	2	2.49	0.952
<i>G. People should always support the decisions of their government even if they disagree with them</i>	3	2.71	0.713	3	3.05	0.921

Table 4.9a: Test for independence of response distributions by language group for the Traditionalism battery, female respondents only

	Independent-sample t-test		Mann Whitney's U Test		η^2
	<i>t</i> -statistic	<i>p</i>	<i>U</i>	<i>p</i>	
<i>A. Even though parental demands may be unreasonable, children should still do as they're told</i>	0.36	0.720	14562	0.622	
<i>B. Being a student, one should not question the authority of their teacher</i>	1.21	0.226	15296	0.154	
<i>C. When one has a conflict with a neighbor, the best way to deal with it is to yield to the other person</i>	0.92	0.357	14890	0.331	
<i>D. For the sake of the family, the individual should put his personal interests second</i>	1.82	0.070	15482	0.080	0.010
<i>E. Sometimes one has to follow one's own beliefs regardless of what other people thinks</i>	-0.36	0.718	13522	0.461	
<i>F. Open conflict among politicians are harmful to society</i>	0.52	0.604	14650	0.504	
<i>G. People should always support the decisions of their government even if they disagree with them</i>	1.06	0.290	15040	0.300	

Table 4.9b: Test for independence of response distributions by language group for the Traditionalism battery, male respondents only

	Independent-sample t-test		Mann Whitney's U Test		η^2
	<i>t</i> -statistic	<i>p</i>	<i>U</i>	<i>p</i>	
<i>A. Even though parental demands may be unreasonable, children should still do as they're told</i>	0.3	0.803	1022.5	0.903*	
<i>B. Being a student, one should not question the authority of their teacher</i>	1.8	0.080	1174	0.091*	0.030
<i>C. When one has a conflict with a neighbor, the best way to deal with it is to yield to the other person</i>	0.1	0.949	979	0.965*	
<i>D. For the sake of the family, the individual should put his personal interests second</i>	-0.1	0.954	983	0.812*	
<i>E. Sometimes one has to follow one's own beliefs regardless of what other people thinks</i>	0.5	0.647	1062	0.637*	
<i>F. Open conflict among politicians are harmful to society</i>	1.1	0.294	1081	0.371*	0.013
<i>G. People should always support the decisions of their government even if they disagree with them</i>	1.9	0.058	1220	0.040*	0.040

Figure 4.15: Relative frequency distribution of assessing democracy in PRC by language group

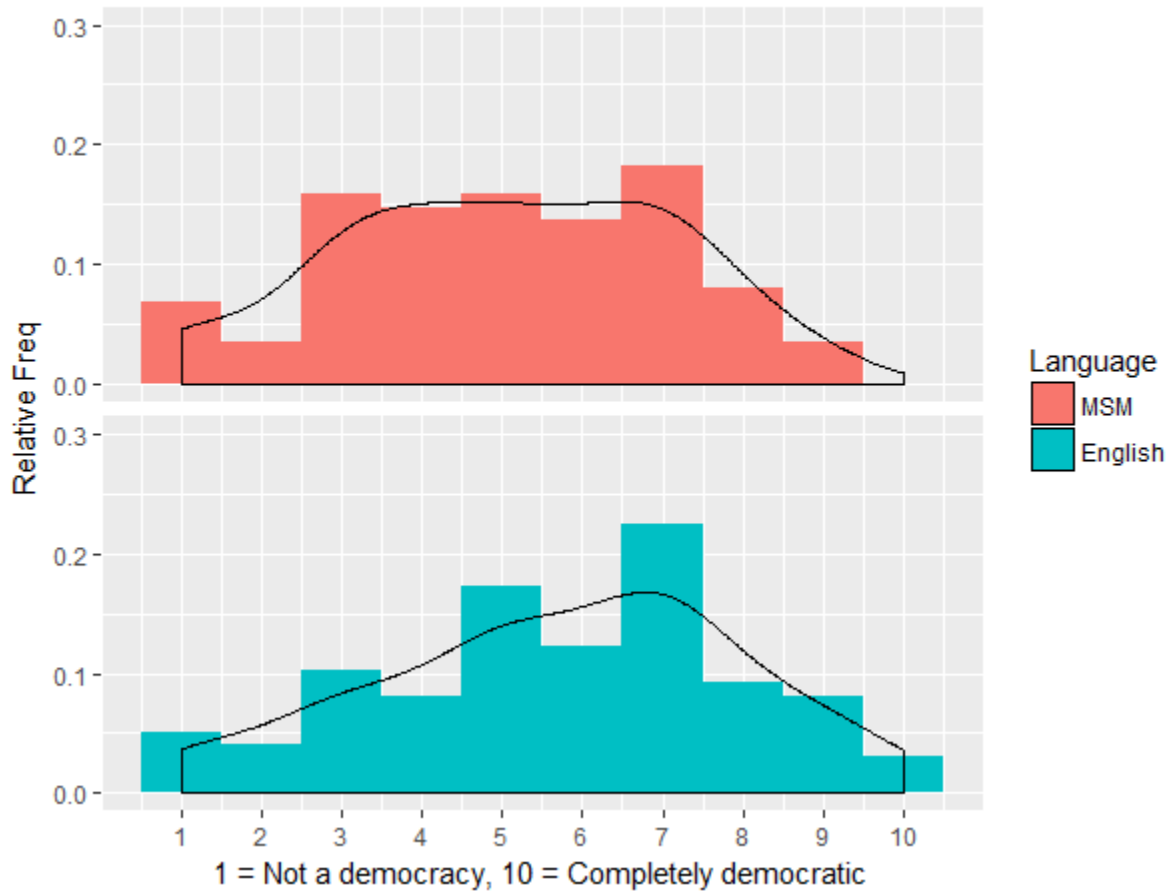


Figure 4.16: Relative frequency distribution of desire for democracy in PRC by language group



Figure 4.17: Relative frequency distribution of suitability of democracy for PRC by language group

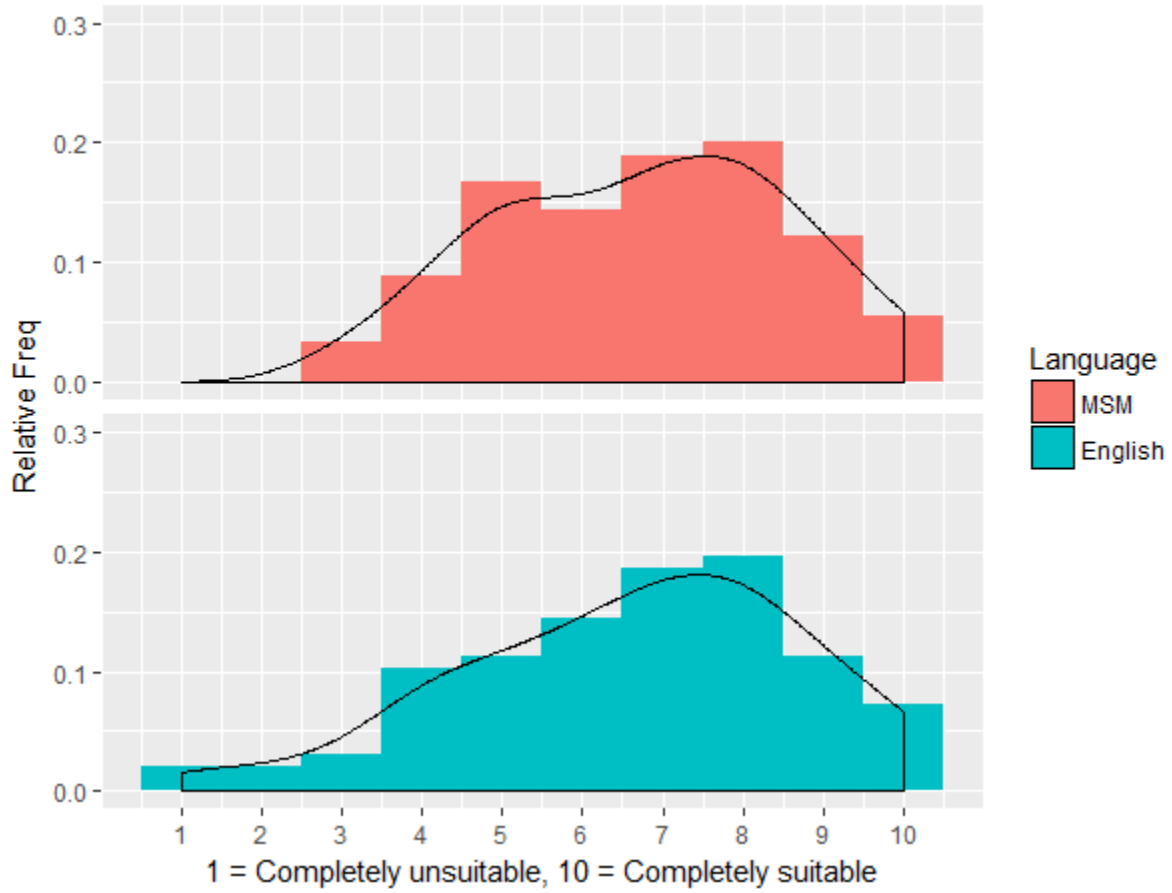


Table 4.10: Descriptive statistics by language group for assessment of democracy, all respondents											
	<i>Descriptive statistics</i>						<i>independent-samples t-test</i>			<i>Mann Whitney's U Test</i>	
	<i>MSM median</i>	<i>MSM mean</i>	<i>SD</i>	<i>English median</i>	<i>English mean</i>	<i>SD</i>	<i>t-test statistic</i>	<i>p</i>	<i>η²</i>	<i>U</i>	<i>p</i>
<i>Assessment of current country as democracy</i>	5	5.03	2.09	6	5.71	2.27	2.13	0.03	0.02	5073.50	0.04
<i>Assessment of desire for democracy now</i>	8	7.08	1.90	8	7.14	2.11	0.22	0.82		4585.50	0.63
<i>Suitability of democracy to PRC</i>	7	6.73	1.82	7	6.61	2.11	-0.44	0.66		4310.00	0.88

Appendix A: Survey Administration

The survey was administered in various academic departments at Capital Normal University between May 29 and June 7, 2013, in Beijing, China. Though survey development and design had begun in March 2013, I accelerated the timetable after receiving sudden permission to go ahead at the end of that current school year.

The initial plan of the survey and all but the experimental behavior modules for Chapter 2 were completed by mid-May 2013. In cooperation with students of the CNU Psychology department, I set monetary thresholds for the low, medium, and high stakes, and adjusted the converted KRW amounts from the original loss aversion experiments from Keysar *et al.* (2012) to match. I submitted the final list of questions for review by my hosts at CNU, and after receiving approval, conducted a pilot study to check for flow, comprehension, and also timing. Based on the feedback, I adjusted the wording on item D in the Traditionalism Battery²²⁸ to reduce its vocabulary difficulty in the survey. I then submitted the completed survey to the University of Illinois Institutional Review Board and received approval (exempt application #13852).

Because of the need to have a gain frame and a loss frame on the Asian Disease question (Chapter 2, Experiment 1), the resulting survey had four versions that required randomization. For the first iteration of the survey, I used Random.Org, which generates random numbers from atmospheric noise, in order to physically randomize the four versions of the survey. Students from the Psychology department then handled the physical administration of the survey at various departments, and they made no special indication that this was a survey conducted by an

²²⁸ **Original wording:** When one has a conflict with a neighbor, the best way to deal with it is to accommodate the other person. **Changed wording:** When one has a conflict with a neighbor, the best way to deal with it is to yield to the other person.

outside researcher, though the attached explanatory sheet (see Appendix B) likely made that clear.

Though my host department and the departments that were initially surveyed (see list below) did not have objections to the survey, I was informed that the survey could not be administered as-is in the other departments that had initially accepted this project. This necessitated revisions (and subsequent approval by the IRB to the amendment to my exempt application), which cut out seven questions and the need to reword instructions on an additional ten questions. The two versions of the surveys in both English and MSM can be found in Appendix B for comparison.

In general, most questions about unconventional political participation (*e.g.* frequency of participation in a demonstration) and about perception of the PRC as a democracy had to be cut. Questions that incorporated "politics" in its Mandarin Chinese wording had to be adjusted to use a less sensitive phrase ("happenings in our country").

After submitting the revised list of questions for review, the survey was administered without further difficulty, and the completed surveys were returned to me for coding in mid-June 2013.

Participating departments:

Version 1: Complete list of questions

- Chemistry: 97 participants
- Foreign Languages: 95 participants

Version 2: Revised and cut list of questions

- Chinese Language and Literature: 97 participants
- Computer Science: 99 participants
- Early Education: 49 participants

Appendix B: Survey Questionnaires

A. Version 1

Hello everyone,

This study will investigate how the learning and use of a second language may affect your attitudes and actions in life.

You will be asked to fill out a questionnaire. This questionnaire will contain 61 questions and will take about 30 minutes to complete.

This is not a test, and there are no right or wrong answers. Please fill out the survey as completely and as honestly as possible, as many incomplete answers will make the survey unusable. Please do not look for answers or ask for help from anyone.

All information will be kept anonymous and secure. No personally identifying information will be collected, and the data cannot be used to identify any specific respondent.

Participation is voluntary, and your decision to participate, decline, or withdraw from participation will have no effect on your grades at, status at, or future relations with Capital Normal University.

More information about your rights as a participant is included on the first page of your questionnaire packet. Please keep that page for your records.

This questionnaire is not a test and contains no incorrect answers. Please answer each question to the best of your ability, as incomplete questionnaires must be eliminated from the final results. Please do not look for the answer or ask for help from others. Please provide only one answer per question.

1. Recently, a dangerous new disease has been going around. Without medicine, 600,000 people will die from it. In order to try to save these people, two types of medicine are being made.

Gain Frame

If you choose Medicine A, 200,000 people will be saved.

If you choose Medicine B, there is a 1/3 chance that 600,000 people will be saved and a 2/3 chance that no one will be saved.

Which drug will you choose? (Circle one) Medicine A Medicine B

Loss Frame

If you choose Medicine A, 400,000 will die.

If you choose Medicine B, there is a 1/3 chance that no one will die and a 2/3 chance that 600,000 people will die.

Which drug will you choose? (circle one) Medicine A Medicine B

2. How interested are you in politics?

- 1. Very interested
- 2. Somewhat interested
- 3. Not very interested
- 4. Not at all interested

3-6. People use different sources to learn what is going on in their country and the world. For each of the following sources, please indicate how often you used the following sources to obtain news about politics last week.

	Everyday	Several times a week	Once or twice a week	Less than once a week	I don't use it
3. Daily Newspaper	1	2	3	4	5
4. Television	1	2	3	4	5
5. Radio	1	2	3	4	5
6. Internet	1	2	3	4	5

7. When you get together with your family member or friends, how often do you discuss political matters?

1. Frequently
2. Occasionally
3. Never

8. You will have a 50% chance of winning ¥500, you will have a 50% chance of losing ¥625

Do you accept this bet? Yes No

9. You will have a 50% chance of winning ¥500, you will have a 50% chance of losing ¥1000

Do you accept this bet? Yes No

10. You will have a 50% chance of winning ¥500, you will have a 50% chance of losing ¥2500

Do you accept this bet? Yes No

11. You will have a 50% chance of winning ¥500, you will have a 50% chance of losing ¥715

Do you accept this bet? Yes No

12. You will have a 50% chance of winning ¥500, you will have a 50% chance of losing ¥550

Do you accept this bet? Yes No

13. You will have a 50% chance of winning ¥500, you will have a 50% chance of losing ¥1250

Do you accept this bet? Yes No

14. How would you rate your family's economic situation today?

1. Very good
2. Good
3. So-so (not good and not bad)
4. Bad
5. Very Bad

15. How would you compare your family's current economic condition with what it was five years ago?

1. Much better
2. A little better
3. About the same
4. A little worse
5. Much worse

16. How much impact do you feel government policies have on your daily life?

1. A great deal of impact
2. Quite some impact
3. A little impact
4. No impact at all
8. Don't Know

17. How satisfied are you with the way the people now in national office are handling the country's affairs?

1. Very satisfied
2. Fairly satisfied
3. Fairly dissatisfied
4. Very dissatisfied
8. Don't Know

18-24. Please tell me how you feel about the following statements.

	Strongly Agree	Somewhat Agree	Neither Agree Nor Disagree	Somewhat Disagree	Strongly Disagree
18. Even if parents' demands are unreasonable, children should still do what they ask.	1	2	3	4	5
19. Being a student, one should not question the authority of their teacher.	1	2	3	4	5
20. When one has a conflict with a neighbor, the best way to deal with it is to accommodate the other person.	1	2	3	4	5
21. For the sake of the family, the individual should put his personal interests second.	1	2	3	4	5
22. Sometimes one has to follow one's own beliefs regardless of what other people think.	1	2	3	4	5
23. Open conflicts among politicians are harmful to society.	1	2	3	4	5
24. People should always support the decisions of their government even if they disagree with them.	1	2	3	4	5

How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your views fall somewhere in between, you can choose any number in between.

25. Incomes should be made more equal 1 2 3 4 5 6 7 8 9 10 We need larger income differences as incentives for individual effort

26. Some people favor, and others are against, having this country provide economic aid to poorer countries. Do you think that this country should provide more or less economic aid to poorer countries? Would you say we should give ...

1. A lot more than we do now
2. Somewhat more than we do now
3. Somewhat less than we do now
4. A lot less than we do now

27. Imagine that you and another person are given an amount of money to split between the two of you. Your job is to divide the money. The other person's job is to decide whether to accept your offer.

You can give this person none of the money, some of the money or all of the money. If he or she decides to accept the offer, then you two split the money according to your proposal. If the other person rejects the offer, neither of you receive any money.

How would you propose to split:

yourself:

- A. ¥5?
- B. ¥50?
- C. ¥500?

Give to the other person:

Keep for

28-30. For each statement, would you say you **strongly agree, somewhat agree, neither agree or disagree, somewhat disagree** or **strongly disagree**?

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
28. I think I have the ability to participate in politics.	1	2	3	4
29. Sometimes politics and government seems so complicated that a person like me can't really understand what is going on.	1	2	3	4
30. Those who govern this country are interested in what ordinary citizens think	1	2	3	4

31. Thinking of whether you voted or not ever since you became eligible, how would you describe yourself?

1. Voted in every election
2. Voted in most elections
3. Voted in some elections
4. Hardly ever voted

32-33. Here is a list of actions that people sometimes take as citizens. For each of these, please tell me whether you personally have never, once, or more than once done any of these things during the past three years.

	More than once	Once	Never Done
32. Got together with others to raise an issue or sign a petition	1	2	3
33. Attended a demonstration or protest march.	1	2	3

34-35. On the following scale, if 1 stands for "Not a democracy" and 10 stands for "Complete democracy", and smaller scores represent less democratic and larger scores represent more democratic. Please rate each situation according to how democratic they are.

34. Where would you place our country under the present government?

Not a Democracy 1 2 3 4 5 6 7 8 9 10 Complete Democracy

35. To what extent would you want our country to be democratic now?

Not a Democracy 1 2 3 4 5 6 7 8 9 10 Complete Democracy

36. Here is a similar scale of 1 to 10 measuring the extent to which people think democracy is suitable for our country. If 1 means democracy is completely unsuitable for PRC today and 10 means that it is completely suitable, where would you place our country today?

Democracy is completely unsuitable. 1 2 3 4 5 6 7 8 9 10 Democracy is perfectly suitable.

37. How often do national government officials obey the law?

1. Always
2. Most of the time
3. Sometimes
4. Rarely
8. Don't know

38. How widespread do you think corruption and bribe-taking are in the national government?

1. Hardly anyone is involved

- 2. Not a lot of officials are corrupt
- 3. Most officials are corrupt
- 4. Almost everyone is corrupt
- 8. Don't Know

39. You will have a 50% chance of winning ¥5, you will have a 50% chance of losing ¥50
Do you accept this bet? Yes No

40. You will have a 50% chance of winning ¥5, you will have a 50% chance of losing ¥7.15
Do you accept this bet? Yes No

41. You will have a 50% chance of winning ¥5, you will have a 50% chance of losing ¥16.50
Do you accept this bet? Yes No

42. You will have a 50% chance of winning ¥5, you will have a 50% chance of losing ¥8.30
Do you accept this bet? Yes No

43. You will have a 50% chance of winning ¥5, you will have a 50% chance of losing ¥55
Do you accept this bet? Yes No

44. You will have a 50% chance of winning ¥5, you will have a 50% chance of losing ¥12.50
Do you accept this bet? Yes No

45-50. For each statement, would you say you **strongly agree, somewhat agree, neither agree or disagree, somewhat disagree** or **strongly disagree**?

	Strongly Agree	Somewhat Agree	Neither Agree Nor Disagree	Somewhat Disagree	Strongly Disagree
45. People with little or no education should have as much say in politics as highly educated people.	1	2	3	4	5
46. Government leaders are like the head of a family; we should all follow their decisions.	1	2	3	4	5
47. The government should decide whether certain ideas should be allowed to be discussed in society.	1	2	3	4	5
48. Harmony of the community will be disrupted if people organize lots of groups.	1	2	3	4	5
49. If we have political leaders	1	2	3	4	5

who are morally upright, we can let them decide everything.					
50. When the country is facing a difficult situation, it is okay for the government to disregard the law in order to deal with the situation.	1	2	3	4	5

51. Imagine that you and another person are given an amount of money to split between the two of you. Your job is to divide the money. The other person's job is to decide whether to accept your offer.

The other person can give you none of the money, some of the money or all of the money. If you decide to accept the offer, then you two split the money like he or she proposes. However, if you decide to reject the offer, neither of you will receive any money.

- A. The other person wants to keep ¥16 and give you ¥4.
Do you accept or reject the proposal? Yes No
- B. The other person wants to keep ¥80 and give you ¥20.
Do you accept or reject the proposal? Yes No

52. What is your age? _____

53. What is your gender? Male Female

54. What year are you in University?
1. First year 2. Second year 3. Third year
4. Fourth year 5. Masters student 6. Ph.D. student

55. What is your major? _____

56. What is your political affiliation?
1. No affiliation
2. Communist Youth League
3. Democratic Party

57. What language do you speak the most in the home?
Putonghua (Mandarin Chinese) 1
Local dialect 2
Minority Language 3 _____
Other 4 Specify: _____

58. Please evaluate your English ability:
I don't know the language 1 2 3 4 5 6 7 8 9 10 I am fluent in the language

59. Have you traveled abroad before? If you have, how often do you travel abroad?

1. A few times a year
2. Almost once a year
3. Just a few times in my whole life
4. Just once in my whole life
5. Never

60. What was the total income of your family in the past 12 months? (Please include all wages, salaries, pensions and gifts).

_____ RMB
88. Don't know

61. Here is a scale of incomes on which 1 indicates the lowest income decile and 10 the highest income decile. We would like to know in what group your family is. Please specify the appropriate number, counting all wages, salaries, pensions and other incomes.

Lowest decile 1 2 3 4 5 6 7 8 9 10 Highest Decile

大家好：

这个调查研究学习第二语言对于人们的认知和行为有如何影响。

请你把这份调查题填完。这份调查题有 61 个问题，大约用 30 分钟可以完成。这份调查题不是考试，没有对错之分，我只需要你的诚挚和完整的答案。不完整的答卷必须从统计结果中删除，请不要查寻答案和求教于人。

答案内容不能辨认你的身份。我们不收集个人信息。

参加这个活动没有风险也不需费用。是否参加我的调查是你的自由。你的约定，不管是参加还是拒绝不会影响你在首师大学分，身分或未来关系。

问卷首页有更多关于参加这个调查的信息。请保存这篇通知。

这份问卷不是考试和测验，没有对错之分。我只需要你的诚挚和完整的答案。不完整的答卷必须从统计结果中删除。请不要查寻答案和求教于人。每个问题上请只选一个回答。

1、最近，一种新的疾病正在周围传播，假如没有药物，600,000（60万人）会死于疾病，为解救人民于疾病，发明了两种药物（A和B）。

Gain Frame

假如你选择药物 A，可解救 20 万人。

假如你选择药物 B，有 1/3 的机会解救所有的 60 万人，但是有 2/3 的机会一个人也救不了。

你会选择哪种药物？ 请选择其中一种（画圈）： 药物 A 药物 B

Loss Frame

假如你选择药物 A，40 万人会死亡。

假如你选择药物 B，有 1 / 3 的机会没有人会死，但是有 2 / 3 的机会 60 万人会死。

你会选择哪种药物？ 请选择其中一种（画圈）： 药物 A 药物 B

2、请问您对政治上的事情有没有兴趣了解？

- 1、非常有兴趣 2、比较有兴趣 3、不太有兴趣 4、完全没兴趣

3-6、 人们通过不同渠道了解国家和世界大事, 请问, 您上一周用过下列渠道了解政治?

	每天都用	每周几次	每周一两次	每周不到一次	不用
3、报纸	1	2	3	4	5
4、电视	1	2	3	4	5
5、电台	1	2	3	4	5
6、网络	1	2	3	4	5

7、您经常和家人或朋友谈论政治问题吗？

- 1、经常 2、偶尔 3、从不

8、你会有 50% 的机会赢得 500 元，同时你也会有 50% 的机会失去 625 元。

您是否接受这个赌？ 是 否

9、你会有 50% 的机会赢得 500 元，同时你也会有 50% 的机会失去 1000 元。

您是否接受这个赌？ 是 否

- 10、你会有 50% 的机会赢得 500 元，同时你也会有 50% 的机会失去 2500 元。
 您是否接受这个赌？ 是 否
- 11、你会有 50% 的机会赢得 500 元，同时你也会有 50% 的机会失去 715 元。
 您是否接受这个赌？ 是 否
- 12、你会有 50% 的机会赢得 500 元，同时你也会有 50% 的机会失去 550 元。
 您是否接受这个赌？ 是 否
- 13、你会有 50% 的机会赢得 500 元，同时你也会有 50% 的机会失去 1250 元。
 您是否接受这个赌？ 是 否
- 14、您家目前的经济情况怎样？
 1、非常好 2、还算好 3、不好不坏 4、 太不好 5、非常不好
- 15、您家的经济情况与五年前相比，有什么变化吗？
 1、非常好 2、还算好 3、不好不坏 4、 太不好 5、非常不好
- 16、请问您觉得政府的政策，对您日常生活有多大影响？
 1、 影响非常大 2、 影响相当大 3、 影响不大 4、 完全没有影响
- 17、您对目前政府官员处理国家事务的方式满意吗？
 1、 非常满意 2、 满意 3、 不满意 4、 非常不满意
- 18—24. 我们想知道您对下面各种说法的意见。

	非常同意	同意	不同意	非常不同意
18、即使父母的要求不合理，子女仍应该照看去做	1	2	4	5
19、作为学生，不应该质疑老师的权威	1	2	4	5
20、若与邻居发生争执，最好的处理办法就是尽量迁就对方	1	2	4	5
21、为了家庭的利益，应该把个人的利益摆在其次	1	2	4	5
22、有些时候一个人应该坚持自己想法，不管其他人怎么想	1	2	4	5
23、领导人之间即使有不同意见，也不应该公开互相批评	1	2	4	5

24、即使我们不同意政府的某项政策，一旦政府做出决定，我们也应该支持政府	1	2	4	5
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25、请您告诉我对下列问题的看法，1 表示完全同意左侧的看法，10 表示完全同意右侧的看法，请选择一个适当的位置表示您的看法。

收入应该尽 1 2 3 4 5 6 7 8 9 10 应该加大收入
差距，
可能均等 以鼓励个人努
力工作

26、请问您认为我国对贫困国家应该还是不应该提供经济援助？

- 1、应该
- 2、不应该

27、想象你和另一个人得到一笔钱，要在你俩之间分享。并且由你来决定如何分配这笔钱，这个人决定是否接受你的决定。

你可以：不给他钱，给他一部分的钱，或给他所有的钱。如果这个人决定接受你的裁断，你们就可以按照您的裁断来分配这笔钱。如果这个人决定不接受你的裁断，你们就得不到这笔钱。

你如何分配：	给陌生人	留给自己
A、¥5？	_____	_____
B、¥50？	_____	_____
C、¥500？	_____	_____

28—30. 我们想知道您对下面各种说法的意见：

	非常同意	同意	不同意	非常不同意
28. 我觉得自己很有个能力参与政策	1	2	3	4
29. 总体上，对像我这样的人而言政策太复杂很难理解	1	2	3	4
30. 国家领导认真听取人民群众的意见	1	2	3	4

31. 自从您获得选举权以来，您在之后的各次选举中都投票了吗？

- 1、每次选举都投票了
- 2、大多数选举都投票了
- 3、有的选举投票了
- 4、没有投票

32—33、过去三年中，您有没有采取过下面提到的行动来表达您的观点？

	做过多 次	做过 一次	没有
32、签名情愿	1	2	3
33、威势游行	1	2	3

34—35、1 表达完全不民主，10 表达完全民主，在程度上，分数越小越不民主，分数越大越民主。

34、中国目前的民主程度属于那一种？

不民主 1 2 3 4 5 6 7 8 9 10 完全民主

35、中国目前应该有什么程度的民主？

不民主 1 2 3 4 5 6 7 8 9 10 完全民主

36、如果 1 表示完全不适合，10 表示完全适合，在程度上，分数越小表示越不适合，分数越大表示越 适合。请问您觉得民主对中国的适合程度如何？

完全不适合 1 2 3 4 5 6 7 8 9 10 完全适合

37、在您看来，政府人员一般都会遵守法纪吗？

- 1、总是如此
- 2、大多数情况下如此
- 3、偶尔如此
- 4、从不这样
- 8、不是道

38、请问您认为在中央政府里，贪污腐化的情况普遍不普遍？

- 1、几乎没有
- 2、没有多少人
- 3、相当普遍
- 8、不知道
- 4、几乎人人都贪污腐化

39、你会有 50% 的机会赢得 5 元，同时你也会有 50% 的机会失去 50 元。

您是否接受这个赌？ 是 否

40、你会有 50% 的机会赢得 5 元，同时你也会有 50% 的机会失去 7.15 元。

您是否接受这个赌？ 是 否

41、你会有 50% 的机会赢得 5 元，同时你也会有 50% 的机会失去 16.50 元。

您是否接受这个赌？ 是 否

42、你会有 50% 的机会赢得 5 元，同时你也会有 50% 的机会失去 8.30 元。

您是否接受这个赌？ 是 否

43、你会有 50% 的机会赢得 5 元，同时你也会 50% 的机会失去 55 元。

您是否接受这个赌？ 是 否

44、你会有 50% 的机会赢得 5 元，同时你也会 50% 的机会失去 12.50 元。

您是否接受这个赌？ 是 否

45—50、我们想知道您对下面各种说法的意见：

	非常同意	同意	不同意	非常不同意
45. 受教育程度较低的人应该和受教育程度较高的人拥有一样的政策权利	1	2	3	4
46. 政府领导人是这个大家庭的家长，他们关于国家事务的决定，人们都应该服从	1	2	3	4
47. 一种意见能否在社会上流传，应由政府决定	1	2	3	4
48. 在地方上东一个团体和西一个团体，会影响地方的安全与和谐	1	2	3	4
49. 只要有一位道德高尚的领导人，我们就可以让他决定一切	1	2	3	4
50. 当国家面临困境时，政府对了处理困境可以违反法律	1	2	3	4

51、想象你和另一个人得到一笔钱，要在你俩之间分享。并且由这个人来决定如何分配这笔钱，你决定是否接受他的决定。

他可以：不给你钱，给你一部分的钱，或给你所有的钱。如果你决定接受这个人的裁断，你们就可以按照他的裁断来分配这笔钱。如果你决定不接受他的裁断，你们就得不到这笔钱。

A、这个人决定从 20 元里给你 4 元（他留 16 元）。
你决定接受还是不接受？ 接受 不接受

B、这个人决定从 100 元里给你 20 元（他留 80 元）。
你决定接受还是不接受？ 接受 不接受

52、请问您的年龄? _____岁

53、请问您的性别? 男 女

54、请问您的文化程度?

1、大一 2、大二 3、大三 4、大四 5、研究生 6、博士生

55、请问您的专业? _____

56、您的政治面貌是什么?

- 1、群众
- 2、共青团员
- 3、民主党派

57、请问您在家里通常说哪一种语言?(读出选项)

- 1、普通话
- 2、家乡话 _____
- 3、民族语言 _____
- 7、其他 (请具体说明: _____)

58、请评价您的中文水平:

一点不会 1 2 3 4 5 6 7 8 9 10 十分掌握

59、您是否出过国? 如果有, 次数多吗?

- 1. 一年好几次
- 2. 基本上一年一次
- 3. 就那么几次
- 4. 就一次
- 5. 从没出过国

60、您全家去年的总收入是多少(包括所有的工资、奖金、第二职业收入、亲友馈赠、各种投资收益、其他所得、收获的粮、棉、蔬菜等实物折合的钱;工副业收入;出外做工挣的工资等)?

_____元

88、不知道

61、如果将全国人民的平均家庭收入分为十等份, 请看这个量表, 1 表示家庭收入最低层, 10 表示家庭收入最高层。请您在量表上选择一个数字表示您家的家庭收入水平(包括所有的工资、奖金、第二职业收入、亲友馈赠、各种投资收益、其他所得、收获的粮、棉、蔬菜等实物折合的钱;工副业收入;出外做工挣的工资等)?

最底层 1 2 3 4 5 6 7 8 9 10 最高层
88、不知道

B. Version 2

Hello everyone,

This study will investigate how the learning and use of a second language may affect your attitudes and actions in life.

You will be asked to fill out a questionnaire. This questionnaire will contain 58 questions and will take about 30 minutes to complete.

This is not a test, and there are no right or wrong answers. Please fill out the survey as completely and as honestly as possible, as many incomplete answers will make the survey unusable. Please do not look for answers or ask for help from anyone.

All information will be kept anonymous and secure. No personally identifying information will be collected, and the data cannot be used to identify any specific respondent.

Participation is voluntary, and your decision to participate, decline, or withdraw from participation will have no effect on your grades at, status at, or future relations with Capital Normal University.

More information about your rights as a participant is included on the first page of your questionnaire packet. Please keep that page for your records.

Thank you for participating this study. We hope to investigate how the learning and use of a second language may affect your attitudes and actions in life.

You will be asked to fill out a questionnaire. This questionnaire will contain 54 questions and will take about 30 minutes to complete. Please provide only one answer per question.

This is not a test, and there are no right or wrong answers. Please fill out the survey as completely and as honestly as possible. Please do not look for answers or ask for help from anyone.

1. Recently, a dangerous new disease has been going around. Without medicine, 600,000 people will die from it. In order to try to save these people, two types of medicine are being made.

Gain Frame

If you choose Medicine A, 200,000 people will be saved.

If you choose Medicine B, there is a 1/3 chance that 600,000 people will be saved and a 2/3 chance that no one will be saved.

Which drug will you choose? (Circle one) Medicine A Medicine B

Loss Frame

If you choose Medicine A, 400,000 will die.

If you choose Medicine B, there is a 1/3 chance that no one will die and a 2/3 chance that 600,000 people will die.

Which drug will you choose? (circle one) Medicine A Medicine B

2. How interested are you in politics?

- 1. Very interested
- 2. Somewhat interested
- 3. Not very interested
- 4. Not at all interested

3-6. People use different sources to learn what is going on in their country and the world. For each of the following sources, please indicate how often you used the following sources to obtain news about politics last week.

	Everyday	Several times a week	Once or twice a week	Less than once a week	I don't use it
3. Daily Newspaper	1	2	3	4	5

4. Television	1	2	3	4	5
5. Radio	1	2	3	4	5
6. Internet	1	2	3	4	5

7. When you get together with your family member or friends, how often do you discuss political matters?

4. Frequently
5. Occasionally
6. Never

8. You will have a 50% chance of losing ¥8, you will have a 50% chance of winning ¥14.50

Do you accept this bet? Yes No

9. You will have a 50% chance of losing ¥7, you will have a 50% chance of winning ¥17.50

Do you accept this bet? Yes No

10. You will have a 50% chance of losing ¥10, you will have a 50% chance of winning ¥11

Do you accept this bet? Yes No

11. You will have a 50% chance of losing ¥9, you will have a 50% chance of winning ¥12

Do you accept this bet? Yes No

12. You will have a 50% chance of losing ¥5, you will have a 50% chance of winning ¥40

Do you accept this bet? Yes No

13. You will have a 50% chance of losing ¥6, you will have a 50% chance of winning ¥24

Do you accept this bet? Yes No

14. How would you rate your family's economic situation today?

1. Very good
2. Good
3. So-so (not good and not bad)
4. Bad
5. Very Bad

15. How would you compare your family's current economic condition with what it was five years ago?

6. Much better
7. A little better
8. About the same
9. A little worse
10. Much worse

16. How much impact do you feel government policies have on your daily life?

1. A great deal of impact

- 2. Quite some impact
- 3. A little impact
- 4. No impact at all

17-23. For each statement, please indicate your level of agreement.

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
17. Even if parents' demands are unreasonable, children should still do what they ask.	1	2	3	4
18. Being a student, one should not question the authority of their teacher.	1	2	3	4
19. When one has a conflict with a neighbor, the best way to deal with it is to yield to the other person.	1	2	3	4
20. For the sake of the family, the individual should put his personal interests second.	1	2	3	4
21. Sometimes one has to follow one's own beliefs regardless of what other people think.	1	2	3	4
22. Open conflicts among politicians are harmful to society.	1	2	3	4
23. People should always support the decisions of their government even if they disagree with them.	1	2	3	4

How would you place your views on this scale? 1 means you agree completely with the statement on the left; 10 means you agree completely with the statement on the right; and if your views fall somewhere in between, you can choose any number in between.

24. Incomes should be made more equal 1 2 3 4 5 6 7 8 9 10

We need larger income differences to encourage people to work hard

25. Some people favor, and others are against, having this country provide economic aid to poorer countries. Do you think that this country should provide economic aid to poorer countries?

- 1. Yes
- 2. No

26. Imagine that you and another person are given an amount of money to split between the two of you. Your job is to divide the money. The other person's job is to decide whether to accept your offer.

You can give this person none of the money, some of the money or all of the money. If he or she decides to accept the offer, then you two split the money according to your proposal. If the other person rejects the offer, neither of you receive any money.

How would you propose to split:

	Give to the other person:	Keep for yourself:
A. ¥66?	_____	_____
B. ¥5?	_____	_____
C. ¥475?	_____	_____

27-29. For each statement, please indicate your level of agreement.

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
27. I think I have the ability to participate in politics.	1	2	3	4
28. Sometimes politics and government seems so complicated that a person like me can't really understand what is going on.	1	2	3	4
29. Those who govern this country are interested in what ordinary citizens think	1	2	3	4

30. Thinking of whether you voted or not ever since you became eligible, how would you describe yourself?

5. Voted in every election
6. Voted in most elections
7. Voted in some elections
8. Do not vote

31. Which is more important to democracy?

1. Public, fair, and regularly held elections
2. Government considers the needs of the people when making policy decisions

32. Which is more important to democracy?

1. Citizens have the freedom to criticize the government.
2. Government takes into account the opinions and wishes of the people.

33. Which is more important to democracy?

1. Majority decides policy
2. Government makes decisions for good of the majority.

34. Which is more important to democracy?

1. Leaders must be chosen according to electoral rules and must have been selected by a majority of the people.
2. Leaders must be selected with adequate consideration of their character and abilities.

35. How often do national government officials obey the law?

1. Always
2. Most of the time
3. Sometimes
4. Never

36. How widespread do you think corruption is in the national government?

1. Hardly anyone is involved
2. Not a lot of officials are corrupt
3. Most officials are corrupt
4. Almost everyone is corrupt

37. You will have a 50% chance of losing ¥850, you will have a 50% chance of winning ¥1130

Do you accept this bet? Yes No

38. You will have a 50% chance of losing ¥550, you will have a 50% chance of winning ¥2200

Do you accept this bet? Yes No

39. You will have a 50% chance of losing ¥450, you will have a 50% chance of winning ¥3600

Do you accept this bet? Yes No

40. You will have a 50% chance of losing ¥650, you will have a 50% chance of winning ¥1625

Do you accept this bet? Yes No

41. You will have a 50% chance of losing ¥950, you will have a 50% chance of winning ¥1045

Do you accept this bet? Yes No

42. You will have a 50% chance of losing ¥750, you will have a 50% chance of winning ¥1340

Do you accept this bet? Yes No

43-47. For each statement, please indicate your level of agreement.

	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree
43. People with little or no education should have as much say in politics as highly educated people.	1	2	3	4
44. Government leaders are like the head of a family; we should all follow their decisions.	1	2	3	4
45. The government should decide whether certain ideas should be allowed to be discussed in society.	1	2	3	4
46. Harmony of the community will be disrupted if people organize lots of groups.	1	2	3	4
47. If we have political leaders who are morally upright, we can let them decide everything.	1	2	3	4

48. Imagine that you and another person are given an amount of money to split between the two of you. Your job is to divide the money. The other person's job is to decide whether to accept your offer.

The other person can give you none of the money, some of the money or all of the money. If you decide to accept the offer, then you two split the money like he or she proposes. However, if you decide to reject the offer, neither of you will receive any money.

A. The other person wants to keep ¥16 and give you ¥4.
Do you accept or reject the proposal? Yes No

B. The other person wants to keep ¥80 and give you ¥20.
Do you accept or reject the proposal? Yes No

49. What is your age? _____

50. What is your gender? Male Female

51. What year are you in University?

1. First year 2. Second year 3. Third year 4. Fourth year
5. Masters student 6. Ph.D. student

52. What is your major? _____

53. Are you a member of a political organization?

1. Not a member of anything
2. Communist Youth League
3. Communist Party
4. Democratic Party

54. What language do you speak the most in the home?

1. Putonghua (Chinese)
2. Local dialect _____
3. Minority Language _____
4. Other, please specify: _____

55. Please evaluate your English ability:

I don't know	1	2	3	4	5	6	7	8	9	10	I am fluent
the language											in the language

56. Have you traveled abroad before? If you have, how often do you travel abroad?

6. A few times a year
7. Almost once a year
8. Just a few times in my whole life
9. Just once in my whole life
10. Never

57. What was the total income of your family in the past 12 months? (Please include all wages, salaries, pensions and gifts).

_____RMB 88. Don't know

58. Here is a scale of incomes on which 1 indicates the lowest 10% and 10 the highest 10%. We would like to know to which group your family belongs. Please specify the appropriate number, counting all wages, salaries, pensions and other incomes.

Lowest 10%	1	2	3	4	5	6	7	8	9	10	Highest 10%
88. Don't know											

大家好：

这个调查研究学习第二语言对于人们的认知和行为有如何影响。

请你把这份调查题填完。这份调查题有 58 个问题，大约用 30 分钟可以完成。

这份调查题不是考试，没有对错之分，我只需要你的诚挚和完整的答案。不完整的答卷必须从统计结果中删除，请不要查寻答案和求教于人。

答案内容不能辨认你的身份。我们不收集个人信息。

参加这个活动没有风险也不需费用。是否参加我的调查是你的自由。你的约定，不管是参加还是拒绝不会影响你在首师大学分，身分或未来关系。

问卷首页有更多关于参加这个调查的信息。请保存这篇通知。

谢谢你们参加调查。这个调查研究学习第二语言对于人们的认知和行为有如何影响。

请你把这份调查题填完。这份调查题有 58 个问题，大约用 30 分钟可以完成。

这份调查题不是考试，没有对错之分，我只需要你的诚挚和完整的答案。请不要查寻答案和求教于人。每个问题上请只选一个回答。

1、最近，一种新的疾病正在周围传播，假如没有药物，60 万人会死于疾病，为解救人民于疾病，发明了两种药物（A 和 B）。

Gain Frame

假如你选择药物 A，可解救 20 万人。

假如你选择药物 B，有 1/3 的机会解救所有的 60 万人，但是有 2/3 的机会一个人也救不了。

你会选择哪种药物？请选择其中一种（画圈）： 药物 A 药物 B

Loss Frame

假如你选择药物 A，40 万人会死亡。

假如你选择药物 B，有 1 / 3 的机会没有人会死，但是有 2 / 3 的机会 60 万人会死。

你会选择哪种药物？请选择其中一种（画圈）： 药物 A 药物 B

2、请问你对国家大事有没有兴趣了解？

- 1、非常有兴趣 2、比较有兴趣 3、不太有兴趣 4、完全没兴趣

3—6、人们通过不同渠道了解国家和世界大事，请问，你上一周用过下列哪些渠道了解国家和世界大事？

	每天都用	每周几次	每周一两次	每周不到一次	不用
3、报纸	1	2	3	4	5
4、电视	1	2	3	4	5
5、电台	1	2	3	4	5
6、网络	1	2	3	4	5

7、你经常和家人或朋友谈论国家大事吗？

1、经常 2、偶尔 3、从不

8、你会有 50% 的机会失去 8 元，同时你也会有 50% 的机会赢得 14.50 元。
你是否接受这个赌？ 是 否

9、你会有 50% 的机会失去 7 元，同时你也会有 50% 的机会赢得 17.5 元。
你是否接受这个赌？ 是 否

10、你会有 50% 的机会失去 10 元，同时你也会有 50% 的机会赢得 11 元。
你是否接受这个赌？ 是 否

11、你会有 50% 的机会失去 9 元，同时你也会有 50% 的机会赢得 12 元。
你是否接受这个赌？ 是 否

12、你会有 50% 的机会失去 5 元，同时你也会有 50% 的机会赢得 40 元。
你是否接受这个赌？ 是 否

13、你会有 50% 的机会失去 6 元，同时你也会有 50% 的机会赢得 24 元。
你是否接受这个赌？ 是 否

14、你家目前的经济情况怎样？
1、非常好 2、还算好 3、不好不坏 4、不太好 5、非常不好

15、你家的经济情况与五年前相比，有什么变化吗？
1、非常好 2、还算好 3、不好不坏 4、不太好 5、非常不好

16、请问你觉得国家政策对你日常生活有多大影响？
1、影响非常大 2、影响相当大 3、影响不大 4、完全没有影响

17—23. 我们想知道你对下面各种说法的意见。

	非常同意	同意	不同意	非常不同意
17、即使父母的要求不合理，子女仍应该照着去做	1	2	4	5
18、作为学生，不应该质疑老师的权威	1	2	4	5
19、若与邻居发生争执，最好的处理办法就是尽量迁就对方	1	2	4	5

20、为了家庭的利益，应该把个人的利益摆在其次	1	2	4	5
21、有些时候一个人应该坚持自己想法，不管其他人怎么想	1	2	4	5
22、领导人之间即使有不同意见，也不应该公开互相批评	1	2	4	5
23、即使我们不同意政府的某项政策，一旦政府做出决定，我们也应该支持政府	1	2	4	5

24、请你告诉我对下列问题的看法，1 表示完全同意左侧的看法，10 表示完全同意右侧的看法，请选择一个适当的位置表示你的看法。

收入应该尽可能均等 1 2 3 4 5 6 7 8 9 10
 应该加大收入差距，

以鼓励个人努力工作

25、请问你认为我国对贫困国家应该还是不应该提供经济援助？

- 1、应该
- 2、不应该

26、想象你和另一个人得到一笔钱，要在你俩之间分享。并且由你来决定如何分配这笔钱，这个人决定是否接受你的决定。

你可以：不给他钱，给他一部分的钱，或给他所有的钱。如果这个人决定接受你的裁断，你们就可以按照你的裁断来分配这笔钱。如果这个人决定不接受你的裁断，你们就得不到这笔钱。

你如何分配： 给陌生人 留给自己

A、¥60? _____ _____

B、¥5? _____ _____

C、¥475? _____ _____

27—29. 我们想知道你对下面各种说法的意见：

	非常同意	同意	不同意	非常不同意
27. 我觉得自己很有个能力参与讨论国家大事	1	2	3	4
28. 总体上，对像我这样的人而言国家大事太复杂很难理解	1	2	3	4
29. 领导认真听取老百姓的意见	1	2	3	4

- 30、自从您获得选举权以来，您在之后的各次选举中都投票了吗？
- 1、每次选举都投票了
 - 2、大多数选举都投票了
 - 3、有的选举投票了
 - 4、没有投票
- 31、你认为如下两个方面，哪方面对民主更为重要？
- 1、公开，公正，定期的竞争选举
 - 2、决策时考虑人民利益
- 32、你认为如下两个方面，哪方面对民主更为重要？
- 1、群众有向政府提出建议的自由
 - 2、政府能认真听取群众的意见
- 33、您认为如下两个方面，哪方面对民主政治更为重要？
- 1、多数决策
 - 2、政府决策时以群众的利益为重
- 34、您认为如下两个方面，哪方面对民主政治更为重要？
- 1、严格依照选举程序选票数确定领导人
 - 2、充分考虑候选人能力品质确定领导人
- 35、在你看来，公务员一般都会是遵守法纪的楷模吗？
- 1、总是如此
 - 2、大多数情况下如此
 - 3、偶尔如此
 - 4、从不这样
- 36、请问你认为当今社会贪污腐化的情况严重不严重？
- 1、一点都不严重
 - 2、比较不严重
 - 3、比较严重
 - 4、非常严重
- 37、你会有 50% 的机会失去 850 元，同时你也会有 50% 的机会赢得 1130 元。
你是否接受这个赌？ 是 否
- 38、你会有 50% 的机会失去 550 元，同时你也会有 50% 的机会赢得 2200 元。
你是否接受这个赌？ 是 否
- 39、你会有 50% 的机会失去 450 元，同时你也会有 50% 的机会赢得 3600 元。
你是否接受这个赌？ 是 否
- 40、你会有 50% 的机会失去 650 元，同时你也会有 50% 的机会赢得 1625 元。
你是否接受这个赌？ 是 否

41、你会有 50% 的机会失去 950 元，同时你也会有 50% 的机会赢得 1045 元。
你是否接受这个赌？ 是 否

42、你会有 50% 的机会失去 750 元，同时你也会有 50% 的机会赢得 1340 元。
你是否接受这个赌？ 是 否

43—47、我们想知道你对下面各种说法的意见：

	非常同意	同意	不同意	非常不同意
43. 受教育程度较低的人应该和受教育程度较高的人拥有一样的政策权利	1	2	3	4
44. 政府领导人是这个大家庭的家长，他们关于国家事务的决定，人们都应该服从	1	2	3	4
45. 一种意见能否在社会上流传，应由政府决定	1	2	3	4
46. 在地方上东一个团体和西一个团体，会影响地方的安全与和谐	1	2	3	4
47. 只要有一位道德高尚的领导人，我们就可以让他决定一切	1	2	3	4

48、想象你和另一个人得到一笔钱，要在你俩之间分享。并且由这个人来决定如何分配这笔钱，你决定是否接受他的决定。

他可以：不给你钱，给你一部分的钱，或给你所有的钱。如果你决定接受这个人的裁断，你们就可以按照他的裁断来分配这笔钱。如果你决定不接受他的裁断，你们就得不到这笔钱。

A、这个人决定从 20 元里给你 4 元（他留 16 元）。
你决定接受还是不接受？ 接受 不接受

B、这个人决定从 100 元里给你 20 元（他留 80 元）。
你决定接受还是不接受？ 接受 不接受

49、请问你的年龄？ _____ 岁

50、请问你的性别? 男 女

51、请问你的文化程度?

1、大一 2、大二 3、大三 4、大四 5、研究生 6、博士生

52、请问你的专业? _____

53、你的政治面貌是什么?

- 1、群众
- 2、共青团员
- 3、中共党员
- 4、民主党派

54、请问你在家里通常说哪一种语言?(读出选项)

- 1、普通话
- 2、家乡话 _____
- 3、民族语言 _____
- 7、其他 (请具体说明: _____)

55、请评价你的中文水平:

一点不会 1 2 3 4 5 6 7 8 9 10 十分掌握

56、你是否出过国? 如果有, 次数多吗?

- 1. 一年好几次
- 2. 基本上一年一次
- 3. 就那么几次
- 4. 就一次
- 5. 从没出过国

57、你全家去年的总收入是多少(包括所有的工资、奖金、第二职业收入、亲友馈赠、各种投资收益、其他所得、收获的粮、棉、蔬菜等实物折合的钱;工副业收入;出外做工挣的工资等)?

_____元 88、不知道

58、如果将全国人民的平均家庭收入分为十等份, 请看这个量表, 1 表示家庭收入最低层, 10表示家庭收入最高层。请你在量表上选择一个数字表示你家的家庭收入水平(包括所有的工资、奖金、第二职业收入、亲友馈赠、各种投资收益、其他所得、收获的粮、棉、蔬菜等实物折合的钱;工副业收入;出外做工挣的工资等)?

最底层 1 2 3 4 5 6 7 8 9 10 最高层
88、不知道

Appendix C: Chapter 2 Additional Analyses

A. Disaggregating Asian Disease responses by gender

This analysis explores whether the respondent's gender affected how he or she selected a treatment on the Asian Disease problem. Of the 469 out of 475 respondents who reported demographic information such as age and gender, the original sample had 106 males and 363 females. The mean MSM proficiency for male respondents was 6.36 (std. dev. 2.43), while the mean MSM proficiency for female respondents was 6.95 (std. dev. 2.09); the mean English proficiency for male respondents was 8.63 (std. dev. 1.35), while the mean MSM proficiency for female respondents was 8.37 (std. dev. 1.37). Relatively good balance was achieved in assigning sufficient numbers of each gender to all of the frames: for the male respondents, 50 were assigned to the gain frame and 57 to the loss frame, and for the female respondents, 188 were assigned to the gain frame and 176 were assigned to the loss frame.

Figures C.1a and C.1b show the relative frequency distribution of responses for the female respondents, while Figures C.2a and C.2b show the same information for the male respondents. Tables C.1a, C.1b, C.2a, and C.2b shows the same information in tabular form

Female respondents were relatively even in how they selected responses in the gain frame, with about 50% in each language selecting either medicine selection. The situation looks slightly different in the loss frame: while English-language respondents were relatively even in their preference of the medicines, about 15% more female respondents in the MSM-language condition preferred Medicine B as opposed to Medicine A. However, this difference between response distributions in the two frames was not significant in MSM, with $\chi^2(1, 186) = 0.979$, $p = 0.323$, nor in English, with $\chi^2(1, 165) = 0.185$, $p = 0.667$,

The difference is even starker in the male respondent sample, though the dramatic differences in the figures are largely due to low sample size. Most notably, the male respondents display the opposite of the expected pattern of medicine preferences in the English-language condition. Once again, the difference in the MSM condition was not significant, with $\chi^2(1, 50) = 0.731$, $p = 0.393$, but the difference was significant, with $\chi^2(1, 66) = 5.566$, $p = 0.018$.

In conclusion, after disaggregation by gender, only males exhibited any susceptibility to framing effects, but the observed pattern was in the wrong direction and also in the wrong language condition.

B. Disaggregating Asian Disease responses by English proficiency

Some evidence suggests that English proficiency may override cognitive processing. This analysis disaggregates the sample by those who revealed that they were English majors versus those who were not. Because I neglected to collect self-reports of the respondents' self-assessments of their proficiency in Mandarin Chinese *and* English, the only group on which I can randomize language assignment were the students in the department of Foreign Languages. I specifically select English majors here in order to maximize language proficiency.

I could ascertain major information for 471 respondents. Of these respondents, 62 were English majors, and 409 were not. The mean MSM proficiency for English majors was 8.09 (std. dev. 1.33), and the mean English proficiency was 7.60 (std. dev. 1.67). By comparison, the MSM proficiency for the non-majors sample was 8.48 (std. dev. 1.38), and the English proficiency was 6.68 (std. dev. 2.23), almost a full point lower. Balance was relatively good for frame assignment for English majors, with 31 in the gain frame and 30 in the loss frame, but language assignment within frames was relatively awful. While 11 were in MSM and 20 were in English for the gain

frame, 20 were in MSM and 10 in English for the loss frame. Balance was much better for the non-English majors sample, both between frames (205 in gain frame, 204 in loss frame) as well as between languages within frames (nearly equal in the gain frame, 94 MSM-110English in the loss frame).

Figures C.3a and C.3b show the relative frequency distributions of responses for the English majors, and Tables C.3a and C.3b show the information in tabular form. While the swing between frames looks large, there were only about 30 respondents per frame. Both language conditions seemed to show the expected framing effect, with more respondents preferring Medicine A in the gain frame and Medicine B in the loss frame. I conducted Fisher's exact test as the counts were low. As expected, the swing in both languages was not statistically significant, with MSM $p = 0.135$, and English $p = 0.245$.

Figure C.4a and C.3b show the relative frequency distributions of responses for the non-English majors, with the tabular form of this information displayed in Tables C.4a and C.4b. Here, the variations between frames are much smaller. As with the male respondents in part A, English-language respondents in the aggregate displayed a preference pattern opposite of what was expected. The differences between frames was not significant for MSM, with $\chi^2(1, 198) = 0.767$, $p = 0.381$, nor in English, with $\chi^2(1, 211) = 1.365$, $p = 0.243$.

C. Alternate analysis incorporating more lenient codings for offerers

The analysis presented in Experiment 3 only reported analysis for 349 respondents who provided numerical offers in the simulated Ultimatum Game. However, as Table C.5 shows, an additional 62 respondents provided checkmarks in one of both of the boxes. This analysis includes those respondents using checkmarks, assuming that one checkmark means that they

mean to give the entirety of the money to someone and two checkmarks meaning that they mean to split the money in half.

Table C.6 shows the average offer with the revised coding. As compared to Table 2.3, the average offer is now slightly smaller except in the high stakes condition, where the both the MSM-language and English-language respondents were more generous, but only by ¥5.

A graphical examination reveals that the distributions of offers in the low-stakes (Figure C.5a) and medium-stakes (Figure C.5b) condition were essentially unchanged except at the extremes. Figure 2.3c showed that the highest offer in the high-stakes condition was in the English-language condition, consisting of ¥400. However, after incorporating the respondents who answered with checkmarks, there were now respondents in both language conditions who offered the full amount (¥475).

I conducted independent-sample t-tests (assuming unequal variance on the offer amount distributions between language groups) and found that, as before, the differences were not statistically different at any stake level (low stakes: $p = 0.937$; medium stakes: $p = 0.102$; high stakes: $p = 0.482$). In addition, because the independent-sample t-test assumes normal distribution, I also conducted Mann Whitney's U Test on the stake conditions in order to test for the similarity of distributions. This was unable to reject the null hypothesis that the distributions of offers by language condition in all three stakes conditions were different, though the differences in the medium-stakes condition approached significance ($p = 0.096$).

Appendix D: IRB Correspondence

UNIVERSITY OF ILLINOIS
AT URBANA-CHAMPAIGN

Office of Vice Chancellor for Research
Institutional Review Board
528 East Green Street
Suite 203
Champaign, IL 61820



May 23, 2013

Brian Gaines
Political Science
240 Computer Applications Bldg
Political Science
UIUC Campus Mail,
M/C 452

RE: *Investigating the political behavioral implications of language in multilingual societies*
IRB Protocol Number: 13852

EXPIRATION DATE: May 22, 2016

Dear Dr. Gaines:

Thank you for submitting the completed IRB application form for your project entitled *Investigating the political behavioral implications of language in multilingual societies*. Your project was assigned Institutional Review Board (IRB) Protocol Number 13852 and reviewed. It has been determined that the research activities described in this application meet the criteria for exemption at 45CFR46.101(b)(2).

This determination of exemption only applies to the research study as submitted. Please note that additional modifications to your project need to be submitted to the IRB for review and exemption determination or approval before the modifications are initiated.

We appreciate your conscientious adherence to the requirements of human subjects research. If you have any questions about the IRB process, or if you need assistance at any time, please feel free to contact me or the IRB Office, or visit our website at <http://www.irb.illinois.edu>.

Sincerely,

A handwritten signature in black ink that reads "Dustin L. Yocum".

Dustin L. Yocum, Human Subjects Research Exempt Specialist, Institutional Review Board

c: Wenshuo Zhang

Appendix Figures and Tables

Figure C.1a: Relative frequency of medicine selection, gain frame, females only

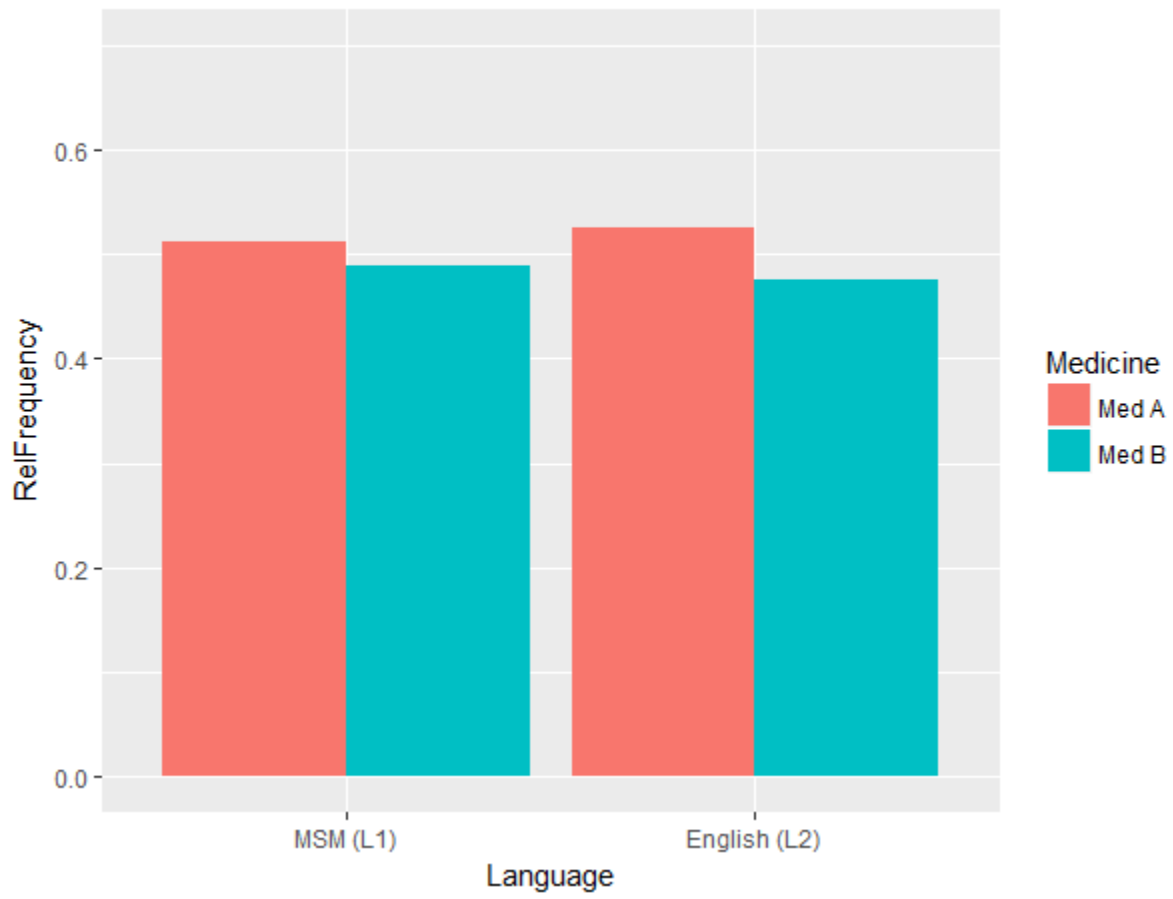


Figure C.1b: Relative frequency of medicine selection, loss frame, females only

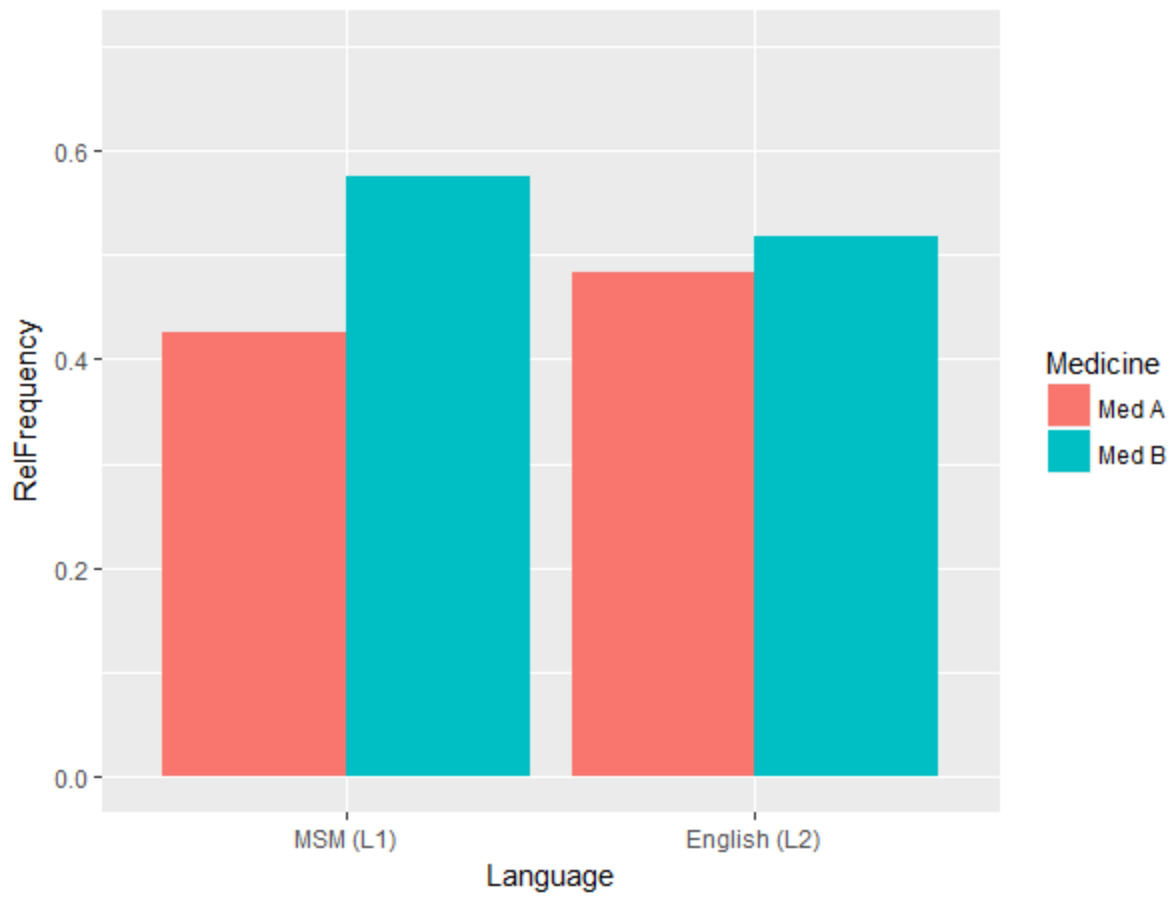


Figure C.2a: Relative frequency of medicine selection, gain frame, males only

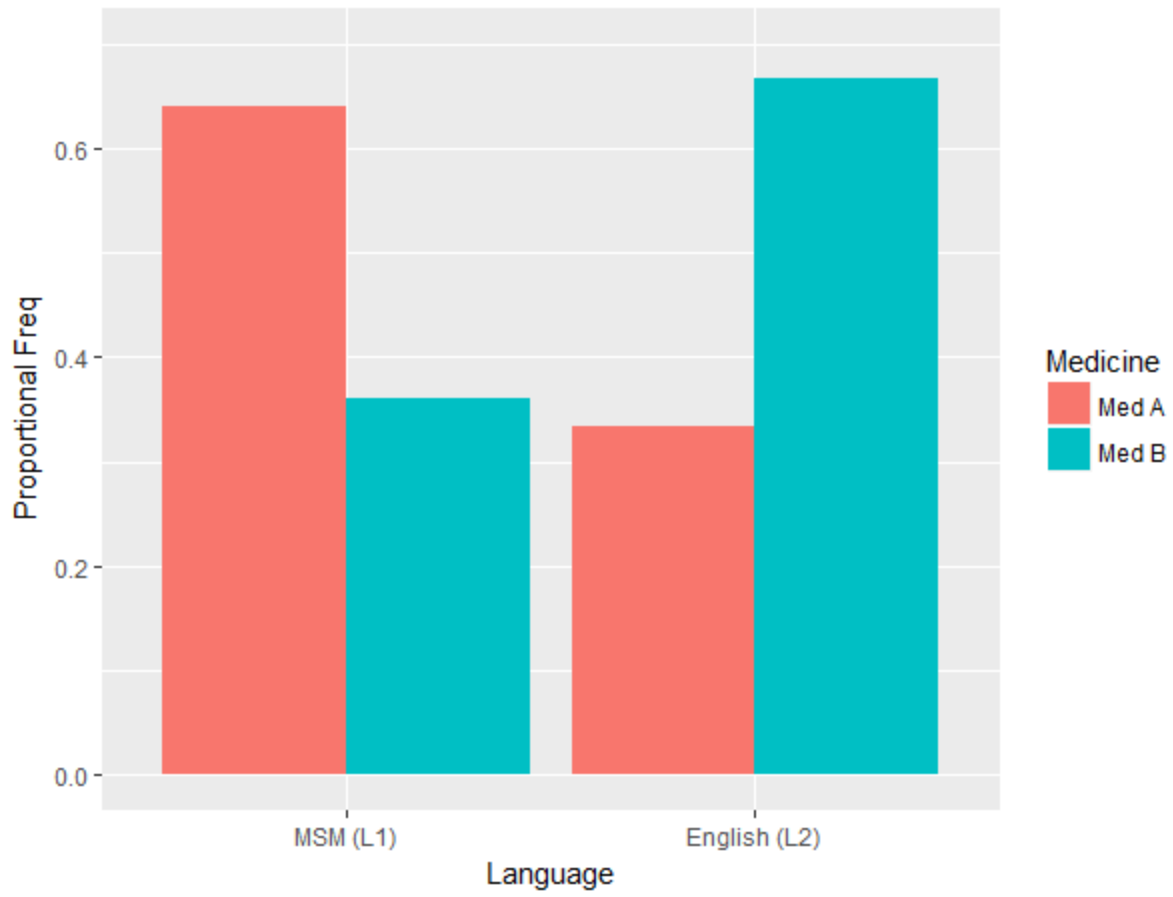


Figure C.2b: Relative frequency of medicine selection, loss frame, males only

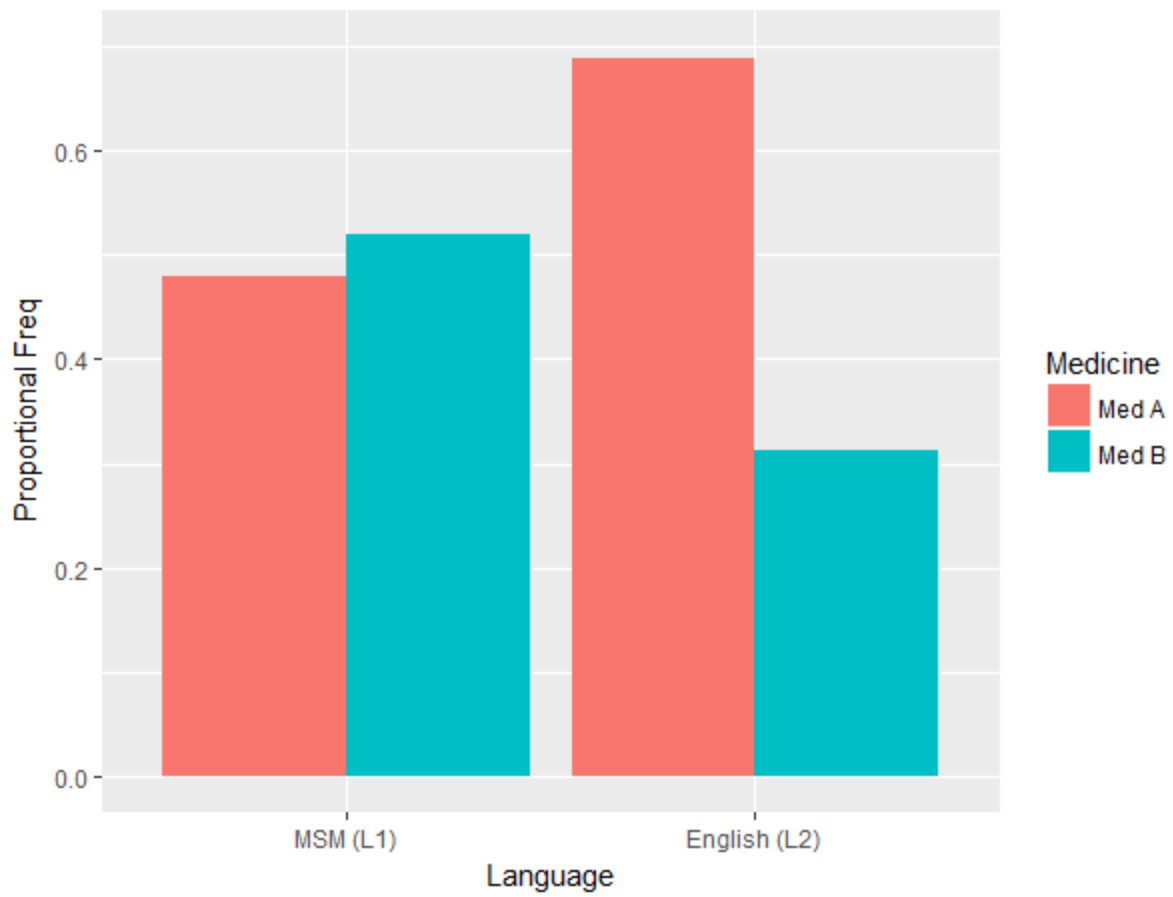


Table C.1a: Frequency and relative frequency of responses, gain frame, female respondents

Language	Medicine A		Medicine B		Total
	Actual	Proportional	Actual	Proportional	
L1 MSM	45	0.511	43	0.489	88
L2 English	52	0.525	47	0.475	99

Table C.1b: Frequency and relative frequency of responses, loss frame, female respondents

Language	Medicine A		Medicine B		Total
	Actual	Proportional	Actual	Proportional	
L1 MSM	37	0.425	50	0.575	87
L2 English	43	0.483	46	0.517	89

Table C.2a: Frequency and relative frequency of responses, gain frame, male respondents

Language	Medicine A		Medicine B		Total
	Actual	Proportional	Actual	Proportional	
L1 MSM	16	0.640	9	0.36	25
L2 English	8	0.333	16	0.667	24

Table C.2b: Frequency and relative frequency of responses, loss frame, male respondents

Language	Medicine A		Medicine B		Total
	Actual	Proportional	Actual	Proportional	
L1 MSM	12	0.480	22	0.588	25
L2 English	22	0.688	10	0.313	32

Figure C.3a: Relative frequency of medicine selection, gain frame, English majors only

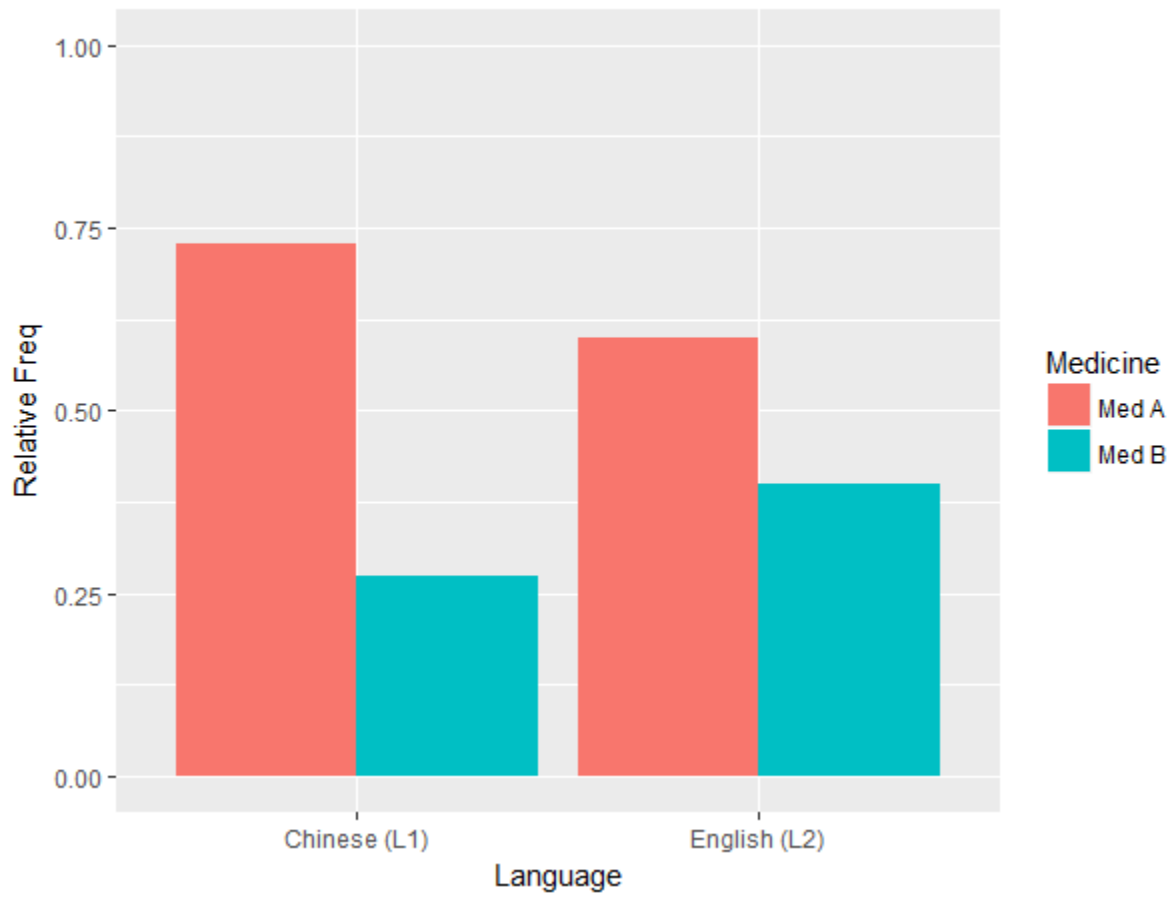


Figure C.3b: Relative frequency of medicine selection, loss frame, English majors only

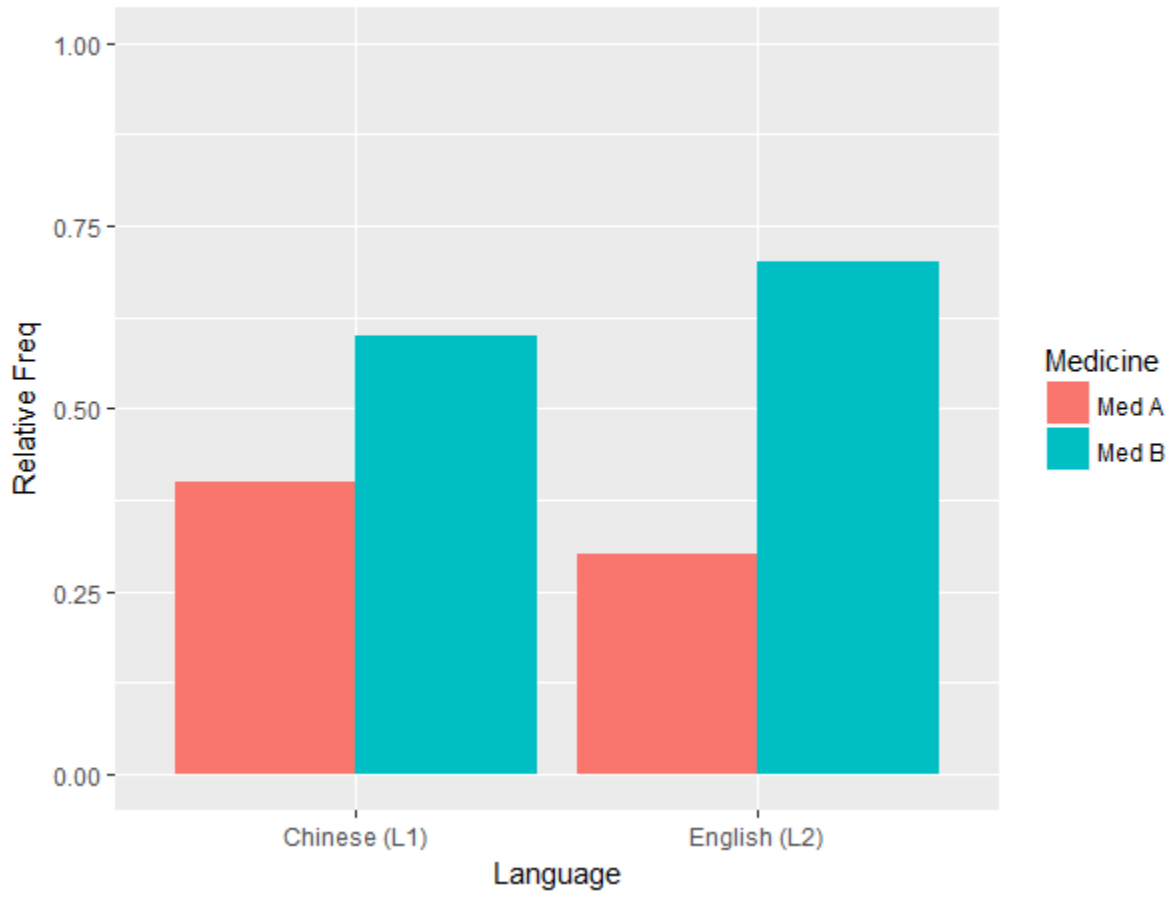


Figure C.4a: Relative frequency of medicine selection, gain frame, non-English majors only

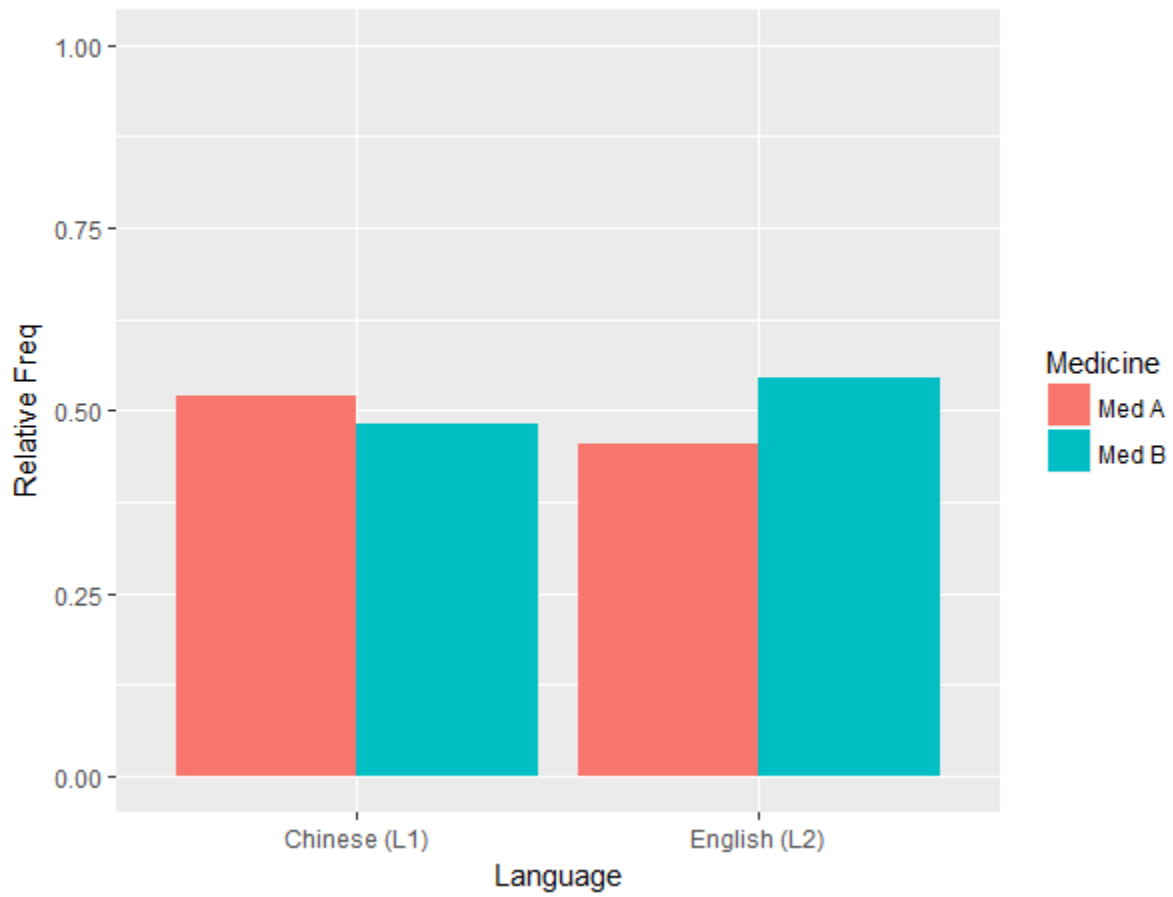


Figure C.4b: Relative frequency of medicine selection, loss frame, non-English majors only

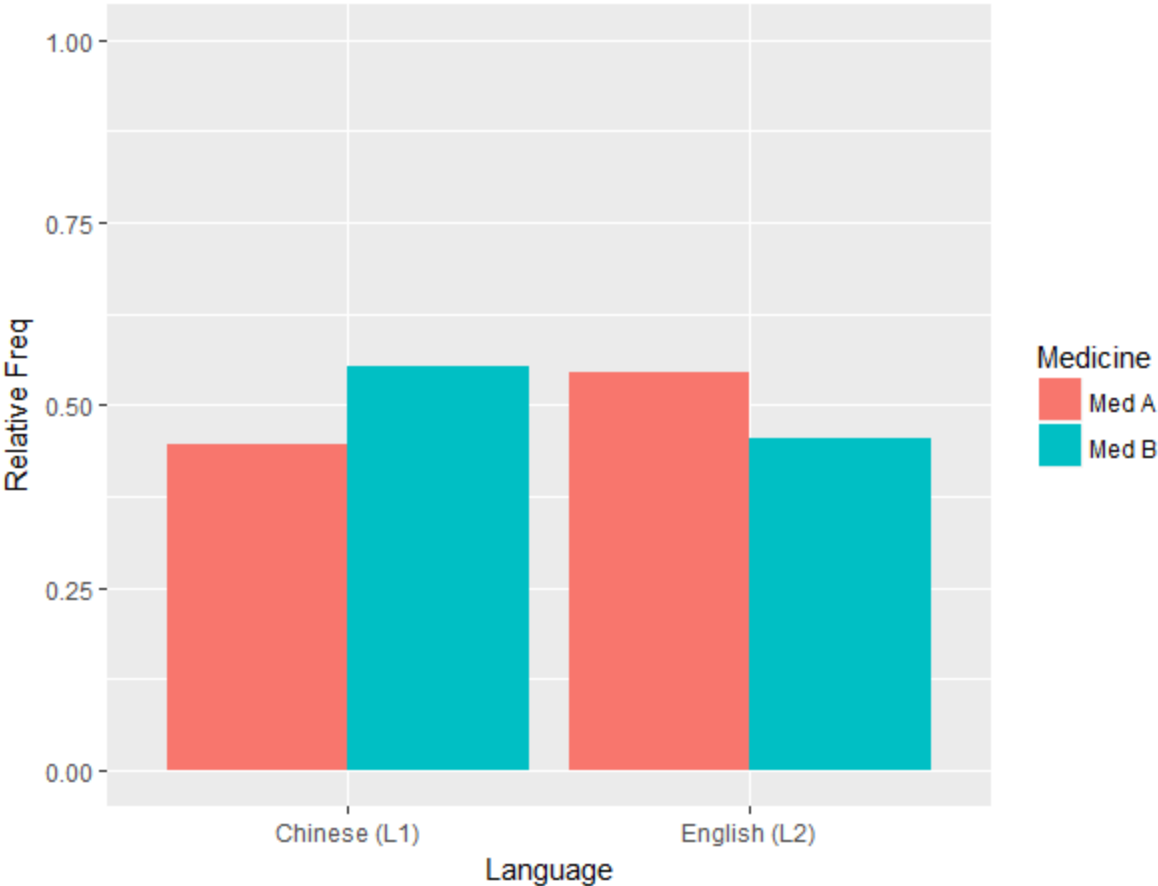


Table C.3a: Frequency and relative frequency of responses, gain frame, English majors

Language	Medicine A		Medicine B		Total
	Actual	Proportional	Actual	Proportional	
L1 MSM	8	0.727	3	0.273	11
L2 English	12	0.600	8	0.400	20

Table C.3b: Frequency and relative frequency of responses, loss frame, English majors

Language	Medicine A		Medicine B		Total
	Actual	Proportional	Actual	Proportional	
L1 MSM	8	0.400	12	0.600	20
L2 English	3	0.300	7	0.700	10

Table C.4a: Frequency and relative frequency of responses, gain frame, non-English majors

Language	Medicine A		Medicine B		Total
	Actual	Proportional	Actual	Proportional	
L1 MSM	54	0.519	50	0.481	104
L2 English	46	0.455	55	0.545	101

Table C.4b: Frequency and relative frequency of responses, loss frame, non-English majors

Language	Medicine A		Medicine B		Total
	Actual	Proportional	Actual	Proportional	
L1 MSM	42	0.447	52	0.553	94
L2 English	60	0.545	50	0.454	110

Table C.5: Distribution of responses by type in Ultimatum Game						
	No Response		Numerical Answer		Checkmarks	
MSM	21	0.092	180	0.789	27	0.118
English	41	0.167	169	0.690	35	0.143
Total	62		349		62	

Table C.6: Offerer proposals with alternate coding in the Ultimatum Game							
		¥5: Low Stakes		¥60: Moderate Stakes		¥475: High Stakes	
		<i>Keep</i>	<i>Give</i>	<i>Keep</i>	<i>Give</i>	<i>Keep</i>	<i>Give</i>
L1 MSM N = 203	<i>Mean</i>	2.75	2.25	27.98	32.01	205.75	269.99
	<i>Std. Dev.</i>	1.32	1.32	12.27	12.26	97.8	95.49
<hr/>							
L2 English N = 204	<i>Mean</i>	2.76	2.25	30	30.03	214.75	260.74
	<i>Std. Dev.</i>	1.48	1.49	14.07	14.07	109.71	110.11

Figure C.5a: Relative frequency of offers in the ¥5 condition

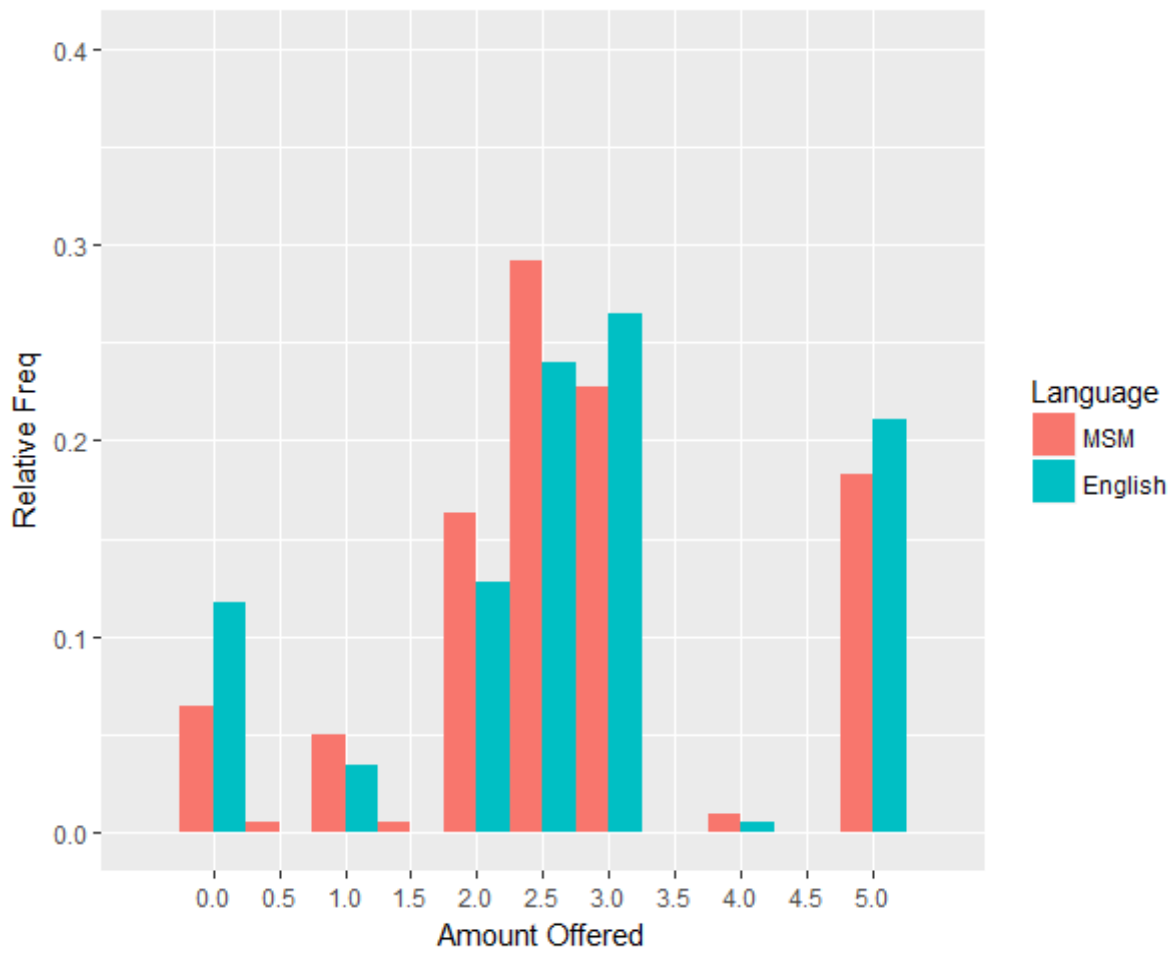


Figure C.5b: Relative frequency of offers in the ¥60 condition

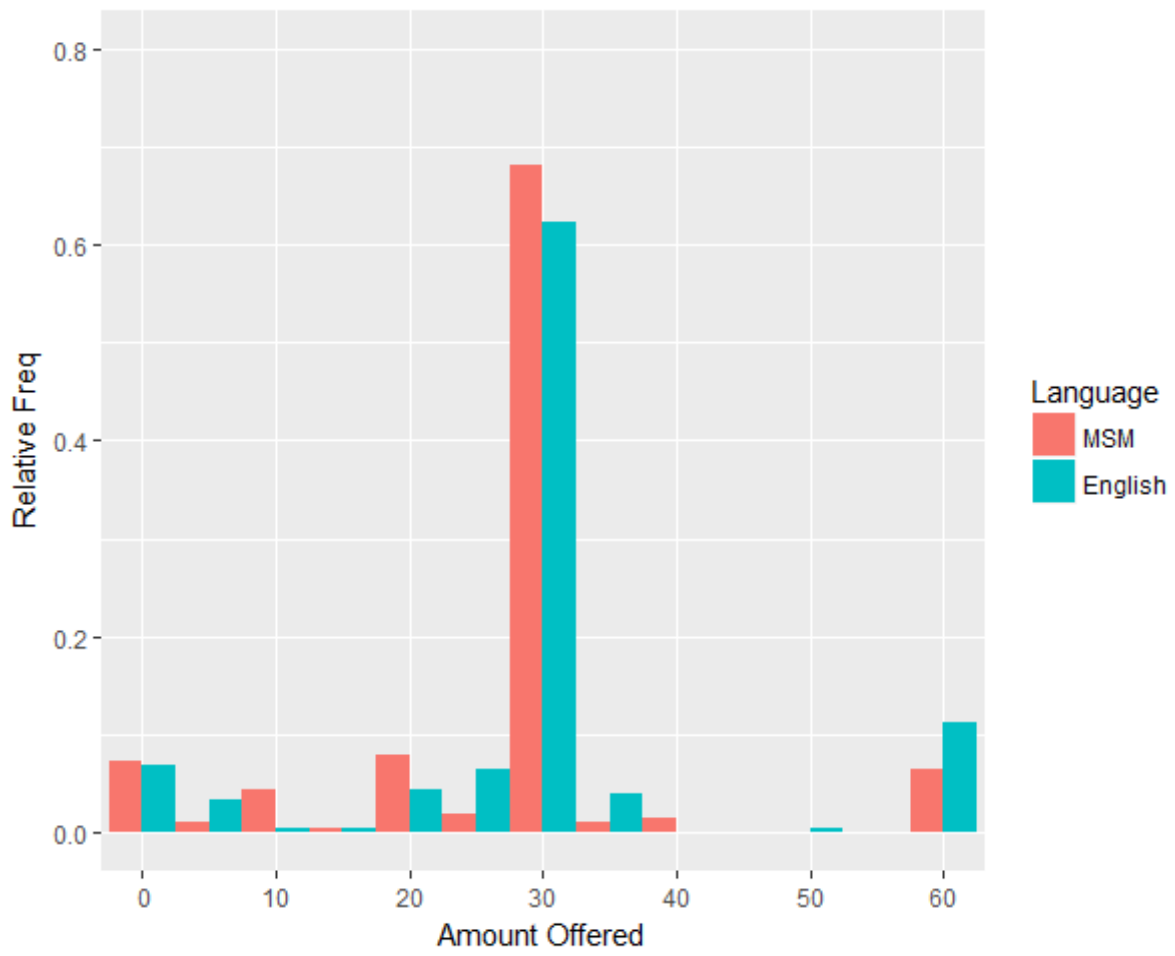
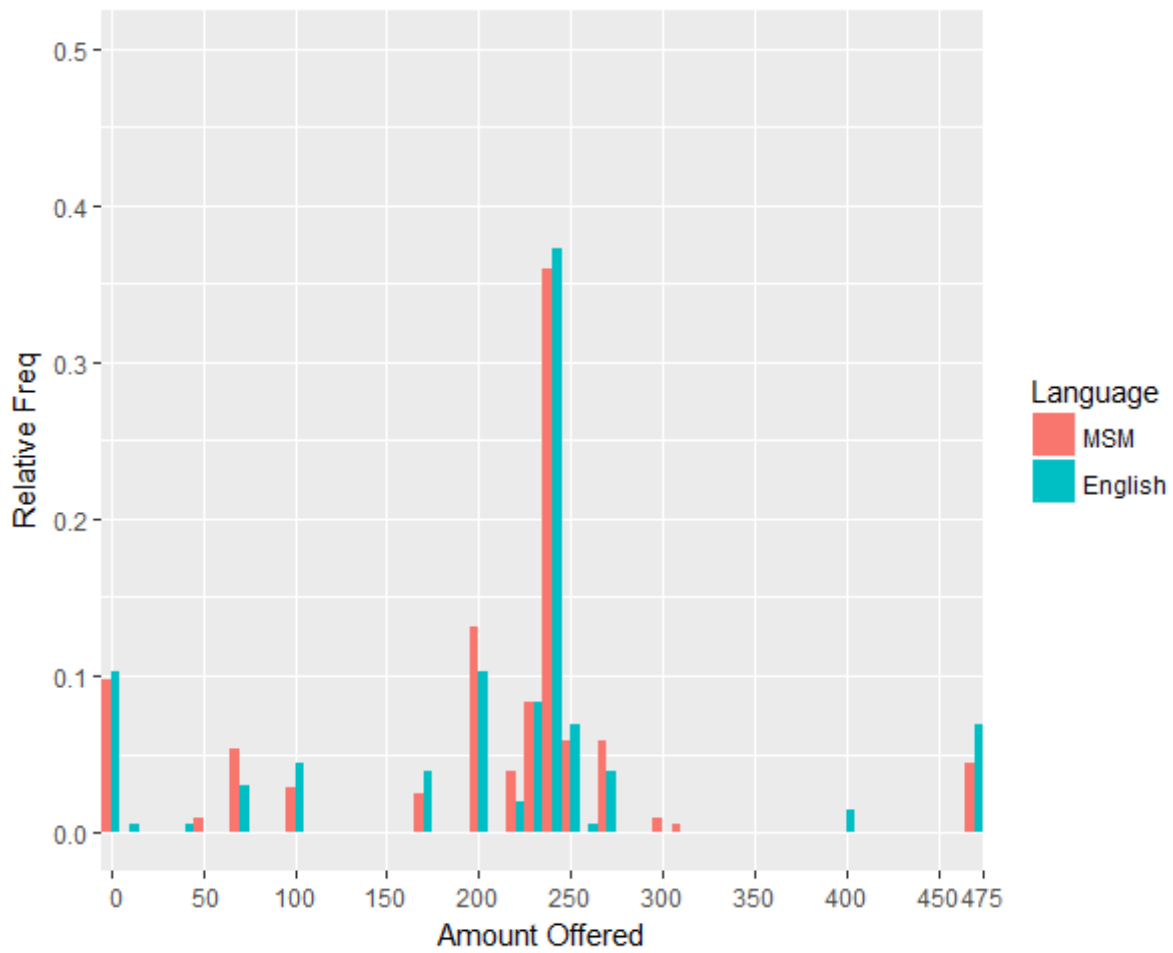


Figure C.5c: Relative frequency of offers in the ¥475 condition



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