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Implicit Stereotyping of Regional Accented Speech and Gender in Pronoun Resolution

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ABSTRACT

This study investigates the activation of gender stereotypes through the use of reference in pronoun resolution. More precisely, the question asked in this thesis is how social stereotypes activated through the speaker's voice (based on their gender and accent) affect language processing when what is being said conflicts with stereotypical beliefs about the speaker. While the effects of these variables have been investigated individually, few studies examine their effects together, and how they collectively interact to affect how language is processed. Through a self-paced listening task, we measured participants' listening times to sentences containing gender stereotyped role nouns (e.g. *cheerleader* or *farmer*) with pronouns (*he*/*she*) either congruent or incongruent with stereotypical gender of the role noun referent, spoken by either a male or female with a French-Canadian accent[1]. We also administered the Emotional Quotient questionnaire and a political ideology questionnaire to explore how a listener's empathy levels and political ideology interact with stereotyping to affect processing. Listening times were significantly slower to incongruent stereotype gender/role noun pairings than congruent, especially with male stereotype gender violations, and particularly when spoken by a male. However, the male and female conditions saw a reverse effect, showing an asymmetry of male and female stereotype processing in the target and spillover segments. Additionally, higher empathy ratings correlated with slower listening times with incongruent stereotype gender conditions in the target segment. In the wrap-up segment, political ideology had an effect, where more progressive participants processed incongruent items faster, while more conservative participants reacted more slowly. The above effects appeared differentially, depending on the segment of the sentence, suggesting a difference in the time course of the integration of various

[1] Results on the effect of accent have not presently been assessed.

types of stereotype information. These results demonstrate a need to further examine the interaction of stereotypes in language processing.

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Section 1. Introduction

Everyday interactions depend on individuals using their world knowledge to communicate effectively. People access their attitudes about culture and social groups during discourse in order to anticipate upcoming sentence information and assess whether what is being said fits into the context (Carreiras, Garnham, Oakhill, & Cain, 1996; Hay, Nolan, & Drager, 2006; Hu & Lindemann, 2009; Strand, 1999). These attitudes are activated automatically through the message's content (Carreiras et al.,1996), the speaker's voice (Boucher, Hammock, Mclaughlin, & Henry, 2013; Hay et al., 2006; Hu & Lindemann 2009; Strand, 1999; Van den Brink et al., 2012;), and the social groups they are perceived to belong to (Anderson & Frideres, 1981; Donald & Gardner, 1970; Gardner & Wonnacott, 1968; Mann & Taylor, 1996; Zheng & Baer, 1974). Not only do aspects of the content and of the speaker affect language processing, but individual differences (such as empathy or political ideology) of the listener themselves influence processing as well (Van den Brink et al., 2012; Marrville, 2017). Individuals use all of this information to build a coherent representation of speech, however, when information is encountered that is contrary to their stereotypical beliefs about the world, language processing may be impacted.

Language processing is an intricate process, and the notion that listeners may call upon their world knowledge is important in delineating exactly how coherence of information is established. Based on the research we explore below, pronoun resolution with gender stereotyped role nouns has been an important method of understanding both how coherence is established in discourse and the processing delays that occur when incongruent stereotype information is encountered. Overall, research has shown that gender stereotypes are automatically activated in

sentences with role nouns (e.g. *doctor* or *nurse*) and that processing delays are seen when pronouns (*he* or *she*) do not agree in stereotypical gender with its referring role noun (e.g. Carreiras et al., 1996). From this, the present study will expand on previous research by examining how gender stereotypes are activated through the use of reference in pronoun resolution in a self-paced listening task, and how social stereotypes activated through the speaker's voice (based on their gender and accent) interact altogether to impact processing when the content of what is being said does not fit with the stereotypical beliefs of who is speaking. This study will also explore how a listener's empathy levels and political ideology may further interact with stereotyping to affect processing. In what follows, we will explore the background of the various modes of how stereotypes affect the processing of speech; through the speaker's voice, the content of what the speaker says, and individual differences of the listener.[2]

1.1 Background

Much of the research on language processing and stereotypes has come from online studies of automatic gender stereotype activation (e.g. Carreiras et al., 1996; Duffy & Keir, 2004; Kreiner, Stuart, & Garrod, 2008; Molinaro et al., 2016). Gender stereotype studies have become an important topic of research, exploring the idea that we use stereotype information to facilitate processing, and that violations of this information can inhibit processing. Banaji et al. (1993) initially looked at gender stereotypes and how personality traits activate them. They examined how certain personality traits are perceived as either prototypically female (e.g. *docile)* or

[2] While we aim to explore the relationship of accented speech in the future, this study is only one part of a two part experiment. Part one of this study includes English speakers, while part two includes French-Canadian accented speakers. Each study independently explores the relationship between gender stereotypes with pronoun resolution, and can only shed light on the role of accented speech when compared against one another. For the scope of the present study, we will focus only on the French-Canadian portion of the experiment. While the present study utilizes accented speech, we will only report on the correlations between speaker gender, stereotype gender, and congruence while also mediated by empathy and political ideology. Future collaboration will examine the role of accented speech. Results of the English portion of the study can be seen in (Hammond-Thrasher, Lõo, Fitzner, & Järvikivi 2020).

prototypically male (e.g. *aggressive*), and concluded that incongruence of a gender-biased trait inhibits processing. In their experiment, for example, exposure to information about aggression was perceived by participants as more relevant to their judgment of a man than to that of a woman.

At the centre of many studies examining the relationship between gender stereotypes and sentence processing is the idea that gender stereotypes are applied to role nouns (Banji & Hardin, 1996; Carreiras et al., 1996; Duffy & Keir, 2004; Kennison & Trofe, 2003 Kreiner et al., 2008). Role nouns have been used to elicit stereotypes, as gender is not in any way explicitly stated. In this paradigm classically employed by Banji and Hardin (1996), participants were presented with a prime (role noun) on a computer screen related stereotypically to gender (e.g. *doctor* or *nurse*), semantically to gender (e.g. *mother* or *king*), or neutrally with respect to gender (e.g. *parent* or *student*). Following the primes, target pronouns that were either matched or mismatched in gender (*he* or *she*) or neutral (*it* or *me*) to the referent were displayed on the screen. After the presentation of the target pronoun, the participants were asked, "Is this a pronoun?". The results showed that individuals responded faster to this question when the gender of the pronoun was consistent with the stereotyped gender of the prime, independent of explicit beliefs about gender stereotypes.

This type of priming paradigm has been used as a basis for myriad subsequent studies to use pronoun resolution with role nouns as a method for exploring gender stereotype activation (Carreiras et al., 1996; Duffy & Keir, 2004; Kennison & Trofe, 2003; Kreiner et al., 2008). Establishing cohesion in language or sentence processing often requires reference by use of a pronoun. The pronoun is used to refer back to an entity, and pronoun resolution refers to the successful establishment of reference between the pronoun and its referring entity. However,

ease of processing can be affected depending on the properties of this entity, such as through the previously stated gender ambiguity of role nouns. Kennison and Trofe (2003) used pronoun resolution with gender stereotyped role nouns as referring entities in sentences in order to test how comprehension may be affected if there was a mismatch between the pronoun gender and the stereotypical gender of the role noun. Participants were instructed to read two sentences. The subject of the first sentence was either a male stereotyped role noun (e.g. *executive*) or a female stereotyped role noun (e.g. *secretary*), while the subject of the second sentence was a pronoun (*he* or *she*). The results of the study found that participants read the sentences with pronouns incongruent to the stereotypical gender of the referent much slower than the congruent versions.

To further understand how and when gender information is accessed, Carreiras et al. (1996) employed this pronoun resolution paradigm with a self-paced reading task as a way to show that individuals have a mental representation of these role nouns as either male or female. This study not only reinforces the effect of gender stereotypes with pronoun resolution, but also emphasizes that there is incremental processing of the representation on the basis of present and past input. The researchers found that readers immediately slow down when the target does not match its referent in gender, concluding that this reaction implies that we apply gender to the noun before the target pronoun is ever presented. These results emphasize the idea that world knowledge is accessed and incorporated into a reader or listener's representation of the context of text or speech (see also Hagoort et al., 2004). These interpretations affect subsequent input, and through the time-course of processing, we can see that when world knowledge is violated (here, in the case of mismatched pronouns to their gender stereotyped role noun referents) they must re-evaluate their previous assumptions. In further support of this finding, this paradigm has been used in eye-tracking experiments to measure fixation times to different regions of sentences

that include a role noun and pronoun (Duffy & Keir, 2004; Kreiner et al., 2008). Both studies found that the fixation times were consistently longer in sentences with incongruent role noun (prime) and target (pronoun) combinations. With various manipulations, the upshot of this paradigm holds true: gender information can automatically influence judgments and processing times of sentences.

Just as reading a role noun activates gender stereotypes, so too does the voice of the speaker activate attitudes and beliefs about them. Previous studies have shown that we use our world knowledge to access information about a speaker, such as through their gender (Van den Brink et al. 2012; Strand, 1999) or accent (Boucher et al., 2013; Hay et al., 2006; Hu & Lindemann, 2009). Language processing is influenced by social context, and we take in information about the speaker to determine plausibility of what is being said. Van den Brink et al. (2012) used ERPs to assess how the gender of a speaker influences sentence processing in relation to the context of the sentence. They presented sentences (e.g. *I cannot sleep without my teddy bear in my arms*) that either matched or mismatched the conceptual stereotypical beliefs of the speaker (child vs. adult male vs. adult female). The ERPs displayed a greater violation for the sentence when spoken by a man, than by the other conditions. These results show that the reaction depends solely on beliefs about the speaker, and that violations occur as a result of mismatch between the stereotypical beliefs of the speaker in relation to the content of the message. Strand (1999) also used gender information from speakers in her research on speech perception. She demonstrated that listeners hear phoneme boundaries between fricatives in different places depending on whether they thought they were listening to a male or female speaker.

Verbal communication provides cues about groups and individuals, so while Van den Brink et al. (2012) and Strand (1999) examined gender stereotypes based on speaker voice, Hay et al. (2006) and Hu and Lindemann (2009) explored how perception of speech changes simply by believing a speaker is from a particular culture. Hu and Lindemann (2009) presented participants with all native English sentences, but labeled the speaker as either American or Cantonese. Even though all the sentences were native English speakers, the participants rated the speech labeled Cantonese as less intelligible. A similar experiment was performed with an Australian speaker, and researchers found that the participants perceived a New Zealand accent in the speaker's speech when they were primed to think they were listening to one (Hay et al. 2006). These two experiments highlight the idea that individuals activate certain cultural stereotypes and apply value judgments onto a speech signal based on those stereotypes and not on qualities of the actual speaker's voice, further demonstrating the power of stereotypes in language processing.

Furthermore, studies on accented speech demonstrate the effects of social information on speech perception (Boucher et al., 2013). Accented speech prompts listeners to access characteristics such as race, social class, and education of the speaker. Boucher et al. (2013) examined how regional dialects elicit evaluative judgments based on listeners' preconceived stereotypes associated with a geographical region. The experiment explored how the connotations of an accent, in particular the southern region of the United States, indicate educational and intellectual inferiority. The researchers presented participants with sentences spoken with either a neutral accent or a southern U.S. accent. Overall, the neutral accent was perceived by the participants as more professional, more competent, and with a higher

educational level even though the sentences that the neutral and regional accented speakers produced were identical.

In a Canadian context, evaluative judgments of French-Canadians (FC) by English-Canadians (EC) were assessed, yielding contrasting results (Anderson & Frideres, 1981; Donald & Gardner, 1970; Gardner & Wonnacott, 1968; Mann & Taylor, 1996; Zheng & Baer, 1974). Mann and Taylor (1996) examined ECs' stereotypical beliefs toward FCs by measuring how they rated FC social desirability, social class, and value systems. ECs rated FCs as having lower social desirability, lower social class, and more conservative values. Gardner and Wonnacott (1968) also found that ECs have highly negative evaluative judgments towards FCs in their study on ethnic stereotypes within Canada. In a follow up study, the stereotypes of FCs were evaluated, where EC participants rated their attitudes towards FCs on various qualities (e.g. honesty, reliability, intelligence, sophistication) (Donald & Gardner, 1970). The overall ratings of the FCs on these qualities were low.

In contrast, Zheng and Baer's (1974) study on gender and family values of English-Canadians (EC) and French Canadians (FC) noted that the ECs were rated as having a more conservative value system than the FCs. Similarly, Anderson and Frideres (1981) evaluated the ethnic relations between ECs and FCs and found there to be little evaluative difference in opinions between the groups of participants. These contrasting results demonstrate a significant gap in the documented attitudes of ECs and FCs toward one another.

While aspects of the speaker play a role in language processing, so do aspects of the listener. Studying individual variation in language processing is important, as individual differences may predict how one may attend to or integrate information to which they are listening. There are cognitive factors, such as one's empathy levels (Van den Brink et al., 2012;

Esteve-Gilbert et al., 2020), and social factors, such as one's political ideology (Marrville, 2017), which mediate language processing and are important to note when taking into account various explanations of the effects of processing. Returning to Van den Brink (2012), the researchers explored not only the role of stereotypical sex differences in the speaker, but also the role of empathy in the listener. Utilizing the self-reporting Empathizing Questionnaire (Baron-Cohen & Wheelwright, 2004), the researchers found that those with a higher empathy rating displayed larger N400 effects when hearing the sentence *I cannot sleep without my teddy bear in my arms* when spoken by a man. The researchers posited that this reaction may occur because those with higher empathy ratings access their stereotypical ideas about the speaker (in regards to their age and sex) in order to make predictions about what the speaker will say. Thus, greater violations were seen when what the speaker said did not agree with their stereotypical worldview. The researchers further hypothesized that those with lower empathy ratings do not use information about stereotypes and make these predictions, but rather process the information given by the speaker and only apply social stereotypes afterwards. In another study on empathy, Esteve-Gilbert (2020) examined how an individual's empathy may influence language processing of sentence meaning with intonation when there is lexical ambiguity. They found that listeners with higher empathy were more sensitive to intonation cues and were able to more successfully disambiguate information. Together, these two studies show that listeners with higher degrees of empathy use their world knowledge to make predictions about the plausibility of what is being said, which may cause processing delays.

Few studies have looked at political ideology and how it may interact with processing of stereotype information. In part of Marrville's (2017) study, he examined how an individual's political ideology may affect the assignment of who causes an action in sentences with two

characters (one male, one female) based on the type of verb used. The verbs were rated for emotional arousal, dominance, and valence (e.g. *agitated* or *scare* as more exciting verbs, and *calm* or *quiet* as less exciting verbs). Participants were presented with sentence fragments (e.g. *Catherine agitated Jacob because…)* and were asked to complete each sentence. The results found that more progressive leaning and more conservative leaning participants differed in their assignment of who caused the action depending on the type of verb used. Not only was this effect found, but it was also shown that as the dominance level of the verb increased, more often was the cause of the action assigned to males. This further establishes the idea that gender is assigned stereotypically to words, and that coherence of a sentence is established through this assignment. This study also reinforces the idea that political ideology and gender stereotypes should be looked at together.

Altogether, these various strands of research confirm that language processing is a complicated process with many underlying mechanisms, highlighting the need to further investigate social and gender stereotypes to understand the nuances of social interaction and language processing. Much of the previous research on stereotypes has looked at gender and accented speech, but only independently of one another. There is a dearth of research that explores how processing of gender stereotyped sentences might be affected when mediated by accented speech, another part of language in which we impart personality and social judgments. The present study explores mediating factors of the speaker, the content of the speech, and of the listeners themselves in order to better understand the activation of stereotypes in language processing. Studying the interaction between these variables poses an interesting new tactic in tracing the factors that influence language processing, as many previous studies have left open questions pertaining to their interacting function.

This research aims to bridge the gap between previous research by studying the effects of genders stereotypes when also mediated by accented speech in order to further explore social and gender stereotypes in language processing. Utilizing self-report measures and French-Canadian accented speech, we also hope to provide a contemporary understanding of the stereotypes between French-Canadian and English-Canadian speakers, and what effect they may have on the processing of gender stereotyped sentences.

1.2 Present study

The present study will primarily focus on exploring individuals' processing of gender stereotyped sentences through pronoun resolution. We aim to investigate interactions between Congruence (congruent vs. incongruent stereotype gender and pronoun gender), Stereotype Gender (female, male), and Speaker Gender (female, male) when mediated by French-Canadian accented speech through a self-paced listening task. As a further exploratory factor, we administer individual difference measures to examine how empathy and political ideology play a role in processing. While this study is primarily exploratory, we do make several hypotheses based on the previous research explored above. Following previous studies on gender stereotypes with pronoun resolution, we expect to see processing delays in sentences with incongruent pronoun and role noun stereotype gender. While we expect to see processing delays in both male and female gender stereotyped incongruent sentences, past research has shown individuals to be more sensitive to male stereotype violations (Van den Brinket al., 2012). Therefore, we expect to see a processing delay in incongruent sentences, with the largest violation occurring with male stereotype gender and male speakers. Also following previous research on empathy and political ideology, we hypothesize that individuals who display higher empathy will take longer with the incongruent sentences, and more conservative leaning individuals will also have

a more difficult time processing the incongruent sentences (Hubert Lyall & Järvikivi, 2020). More tentatively, we hypothesize that the French-Canadian accent may elicit stereotyped beliefs about the speaker which could further interact with political ideology and gender stereotypes to delay processing.

Section 2. Methods

2.1 Participants

The participants were 51 students recruited from the University of Alberta (33 female, 18 male), who received course credit for their participation in the study. The age of the participants ranged from 17-29, with the mean age being 19.8 (*SD*=2.15). All participants were English speakers with normal or corrected-to-normal vision and hearing.

2.2 Materials and Design

The experiment employed a self-paced listening task, which involved participants pacing themselves through parsed recorded sentences. The participants were presented with auditory stimuli, and were instructed to press the spacebar on a computer keyboard to hear each subsequent chunk of the sentence. This type of self-paced paradigm has been used most prevalently to investigate how people interpret ambiguous sentences, and whether they show a preference for one meaning over another (Papadopolou et al., 2013). This method of measurement is also particularly useful as it can display the incremental process of integration of different types of information throughout sentence processing. In the present study, the methodology was modeled as those of previous studies on gender stereotypes in pronoun resolution mentioned (Carreiras et al., 1996), and the sentences used were adapted from Marrville (2017). The sentences tested the activation of gender stereotypes for role nouns (e.g. *cheerleader*). The participants heard a sentence with a role noun followed by a pronoun (*she* or

he). The role nouns were characterized by either an associated female stereotype (e.g. *cheerleader*), or an associated male stereotype (e.g. *farmer*). The pronoun that followed was either congruent or incongruent with the stereotypical gender of the referent (*he* or *she*).

60 experimental items and 15 filler items were created (see Table 2.1 below). Each sentence contained a target pronoun segment (which included the role noun and the pronoun which was either stereotypically congruent or incongruent with the role noun), a spillover segment, and a wrap-up segment. Each participant was presented with one of eight lists. Each list contained 30 sentence stimuli for the female gender stereotyped prime and 30 sentence stimuli for the male gender stereotyped prime. 15 filler sentences consisting of a neutral prime with respect to gender (e.g. *student*) as a control condition were also included. The sentences were controlled for length, and the stereotyped primes were retrieved from a list that had previously been rated for its stereotype effect. Eight counterbalanced lists were created to control for order effects, with reaction times (measured in milliseconds) as the dependent variable.

Table 2.1: Sample sentences from self-paced listening task. (1) Experimental item with role noun stereotyped to refer to females, (2) experimental item with role noun stereotyped to refer to male, (3) filler item with role noun neutral gender.

	Target Pronoun Segment	Spillover	Wrap-up
(1)	*The cheerleader complicated the routine * because selfishly * she/he liked **	*the attention **	*of the audience.*
(2)	*The farmer cooked a big feast * because celebratorily * she/he grew **	*a great yield **	*from the crop this year.*
(3)	*The student arrived to class late * because inadvertently * she/he slept **	*through the alarm **	*that morning.*

Note: The asterisks represent parsing boundaries.

To test for the effects associated with accentedness, the sentences were presented by speakers with a French-Canadian accent. To control for the effects of the gender of the speaker, the sentences were recorded by a both a female and male native French-Canadian speaker.

Following this, there were four types of gender-stereotype sentences, each with two different speakers, a male and a female: (1) female-stereotyped prime word followed by congruent pronoun target; (2) female-stereotyped prime word followed by incongruent pronoun target; (3) male-stereotyped prime followed by congruent pronoun target; (4) male-stereotyped prime followed by incongruent pronoun target. Thus, this study is a 2 (Speaker: Female vs. Male) x 2 (Role Noun Stereotype Gender: Male vs. Female) X 2 (Congruence: Congruent vs. Incongruent stereotype gender and pronoun gender)) mixed within subject design. From this, we looked at how these variables interacted against one another, and also when mediated by participant's empathy ratings, political ideology (conservative leaning or progressive leaning), and accentedness. The experiment was programmed using E-Prime experimental software (Psychology Software Tools Inc. 2012).

2.3 Procedure

Participants sat at a computer and were presented with each auditory sentence over headphones. The sentences were presented to the participant one at a time, one parsed segment at a time. The participant was instructed to press the spacebar to listen to each subsequent segment of each sentence. After the presentation of the sentences, a simple yes/no comprehension question about the sentence was given.

As this study additionally aims to explore the mediation of individual differences on the variables at hand, several post-test questionnaires were administered. Specifically, two language background questionnaires, the emotional quotient questionnaire (EQQ), HEXACO Personality Inventory, and a Political Ideology questionnaire (see Appendix B).

Following the self-paced listening task, a language background questionnaire was used to evaluate the familiarity with the French-Canadian accent, and to identify the prevalent social

stereotypes. The language background questionnaire evaluated the participants' own language background (e.g. bilingualism, languages spoken at home, languages studied). This questionnaire was also used to examine the participant's language experience, specifically with the regional accent. The questionnaire included behavioral questions to assess their personal experience with the accent, as well as to collect demographic information.

As well, the EQQ and HEXACO Personality Inventory to determine the effect of individual differences were given. The HEXACO Personality Inventory was given as an extra individual difference reporting measure, while the EQQ (Baron-Cohen and Wheelwright, 2004) is a 60-item questionnaire designed to measure empathy in adults. As empathy is one of the mediating variables examined in this study, it was the main source to determine empathy ratings in the participants. It contains questions such as *I prefer animals to humans* and *I am quick to spot when someone in a group is feeling awkward or uncomfortable.*

The final questionnaire given was a Political Ideology Questionnaire, which was also adapted from Marrville (2017). This questionnaire requires participants to rate on a scale how much they agree or disagree with various social issues such as abortion, prayer in school, and gun control.

Only the results from EQQ and the Political Ideology Questionnaire will be reported in this thesis.

Section 3. Results

We grouped our stimulus sentences into three segments: the target pronoun segment, spillover segment, and residual wrap-up segment. Previous studies on pronoun resolution with gender stereotypes have found that previously encountered information in a sentence has an effect on newly encountered information during the time-course of online processing (Carreiras

et al., 1996; Esteve-Gilbert et al., 2020; Marrville, 2017; Van den Brink et al., 2012). Thus, when incongruence is encountered, each previously presented segment has an effect on how upcoming information is processed and demonstrates varying results within each segment. Following this, the analysis was conducted within each subsequent segment to fully elucidate where and in how an effect was occurring.

Before data analysis, reaction times for each segment were log transformed to ensure that the data were normally distributed and filler sentences were discarded. Outliers (reaction times that were shorter than the duration of the segment as well as overly short and long reaction times) were excluded using density plots and visual inspection (target segment: 3.1%; spill-over segment: 1.4%; and wrap-up segment: 1.3% of the data, respectively).

Data analysis was carried out using linear mixed effects regression models with package *lme4* (version 1.1-23, Bates et al., 2015) in the R statistical environment (R Core Team, 2019). In order to resolve the observed significant two-way interactions, pairwise comparisons using package *emmeans* and function lsmeans were carried out. The dependent variable was log transformed reaction time (listening time) for each segment. The fixed predictors of interest were Congruence (congruent vs. incongruent stereotype gender and pronoun gender), stereotype gender (female, male), and speaker gender (female, male).

We used a step-wise backward fitting procedure to inspect the effects of the manipulated variables (above). Starting with the maximal model, non-significant interactions and/or predictors were removed from the model, comparing subsequent models' fit to the data with function anova(). After we arrived at the best model for the manipulated variables, by-subject and by-item random slopes were tested (model convergence allowing) in order to ensure that any observed effects were not due to individual participants or items. Individual differences measures

(EQQ and political ideology) were then centered and forward fitted, assessing their contribution to the model fit at each step. All models included Trial and the previous segment log reaction time as control variables. The previous segment reaction time was included in order to control autocorrelation in the data. In addition to the reported effects below, all final models included by-subject random slopes for Congruence and Trial. In what follows, the results for each segment are reported separately.

3.1 Target Pronoun Segment

The target segment of the test items is the point of the trial where participants encounter the pronoun, which is designed to either agree or disagree with the stereotype gender of the role noun presented. Examples of these segments of interest can be seen in Table 2.1 of the methods section. We expected to see multiple effects on the participant listening time directly upon hearing an incongruent pronoun/role noun stereotype gender. We will explore the linear mixed model effects of the target pronoun segment (Table 3.1), followed by pairwise comparisons carried out to resolve the significant two-way interactions found.

As shown in Table 3.1 below, there was a significant effect of Congruence on listening times ($t = -5.997$, $p = 0.000$). The negative sign of this effect indicates that overall faster listening times associated with incongruence of the pronoun/role noun pairings occurred when the participant encountered the pronoun in the target segment. However, this effect should not be interpreted by itself without taking into account the interactions between Congruence and Stereotype Gender and Speaker Gender, respectively (see below). In addition, an effect of trial was observed ($t = -7.023$, $p = 0.000$), showing that as the experiment went on, participants became faster in their listening times. The positive t-value of RT2log control variable of each segment (refer also to Table 3.2 and 3.4) shows that there is a positive correlation between how a

participant processed the previous segment to how a participant would process subsequent segments. This results predicts that if a participant was slower in the previous segment, they would also be slower in the segments to come.

Table 3.1: Summary of linear mixed effects model of the target pronoun segment.

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	5.827	0.112	2721.086	51.932	0.000***
Congruence: Incongruent	-0.067	0.011	371.721	-5.997	0.000***
stgenderM	0.016	0.023	200.982	0.68	0.498
speakergender M	0.051	0.016	1132.662	3.127	0.002**
eqqlog	0.002	0.014	53.972	0.152	0.88
Trial	-0.04	0.006	53.556	-7.023	0.000***
RT2log	0.153	0.015	2755.79	10.054	0.000***
Congruence Incongruent: stgenderM	0.074	0.012	2614.495	6.012	0.000***
Congruence Incongruent: speakergender M	0.044	0.012	2614.027	3.607	0.000***
stgenderM: eqqlog	0.014	0.006	2252.127	2.295	0.022**
stgenderM: speakergender M	-0.072	0.029	593.121	-2.479	0.013**

Important, several significant two-way interactions were observed. First, there was an interaction between Congruence and Stereotype Gender ($t = 6.012$, $p = 0.000$). Pairwise comparisons indicated significantly slower listening times for the congruent female stereotype gender conditions than for the incongruent female stereotype gender conditions ($t = 4.994$, $p = <0.001$), in other words, when a male pronoun was encountered instead of the expected female

one Also, the listening times for the incongruent female stereotype gender condition were significantly faster than the congruent male stereotype gender condition ($t = -2.988$, $p = 0.0193$). In addition, the pairwise comparisons for congruence and stereotype gender indicated significantly faster listening times for the congruent male stereotype condition than the incongruent male stereotype gender condition ($t = -3.167$, $p = 0.0098$).

Second, a significant interaction between Congruence and Speaker Gender was observed ($t = 3.607$, $p = 0.000$; Figure 3.1). A simple effect for male speaker gender was seen ($t = 3.127$, $p = 0.002$), which was qualified by the interaction with Congruence. Pairwise comparisons of this interaction displayed a significant effect of congruence for the female speaker, in that the congruent female speaker condition was processed more slowly than the incongruent female condition ($t = 3.342$, $p = 0.0057$). Second, the effect of the congruent female speaker condition and incongruent male speaker condition differed significantly ($t = -3.070$, $p = 0.0130$), showing that the congruent female speaker condition was processed faster than the incongruent male speaker condition. Next, the effect of the incongruent female speaker condition and congruent male speaker condition differed significantly ($t = -6.543$, $p = <0.001$), showing that the incongruent female speaker condition was processed faster than the congruent male speaker condition. Lastly, the effect for the incongruent female speaker condition and the incongruent male speaker condition significantly differed ($t = -6.543$, $p = <0.001$). The incongruent female speaker condition was processed faster than the incongruent male speaker condition. Altogether, the congruent female condition was processed more slowly than when incongruent, and the incongruent male speaker condition processed the slowest.

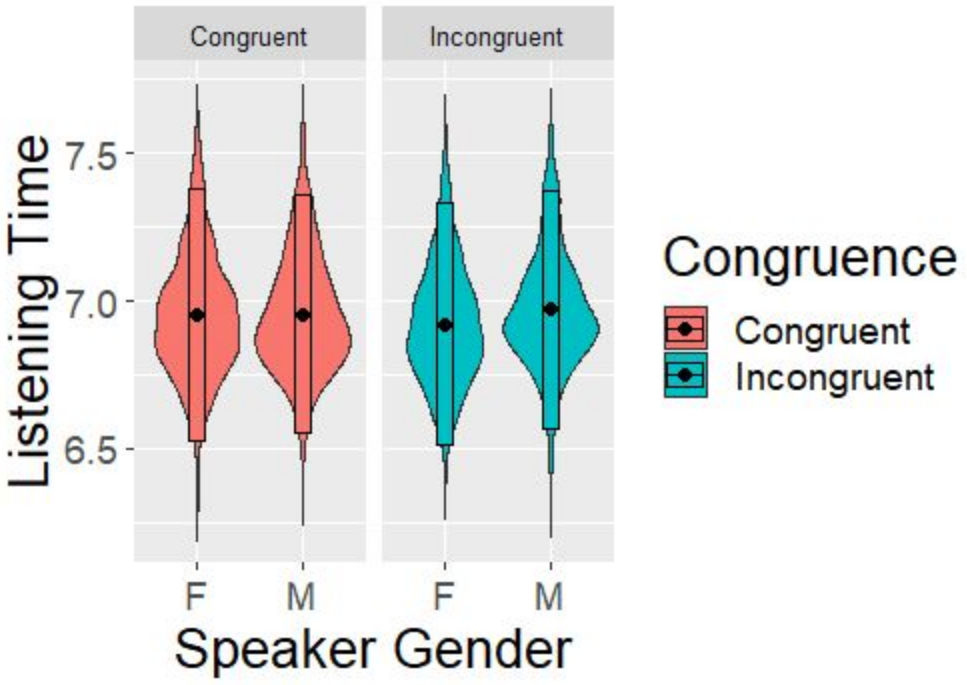

Figure 3.1: Effect of speaker gender and congruence on listening time on the target pronoun segment.

Third, we found an interaction between Stereotype Gender and EQQ ($t = 2.295$, $p = 0.022$). Participants with higher levels of empathy had slower listening times to the male stereotype gender conditions, and participants with lower levels of empathy had faster listening times to the male stereotype gender conditions (see Figure 3.2).

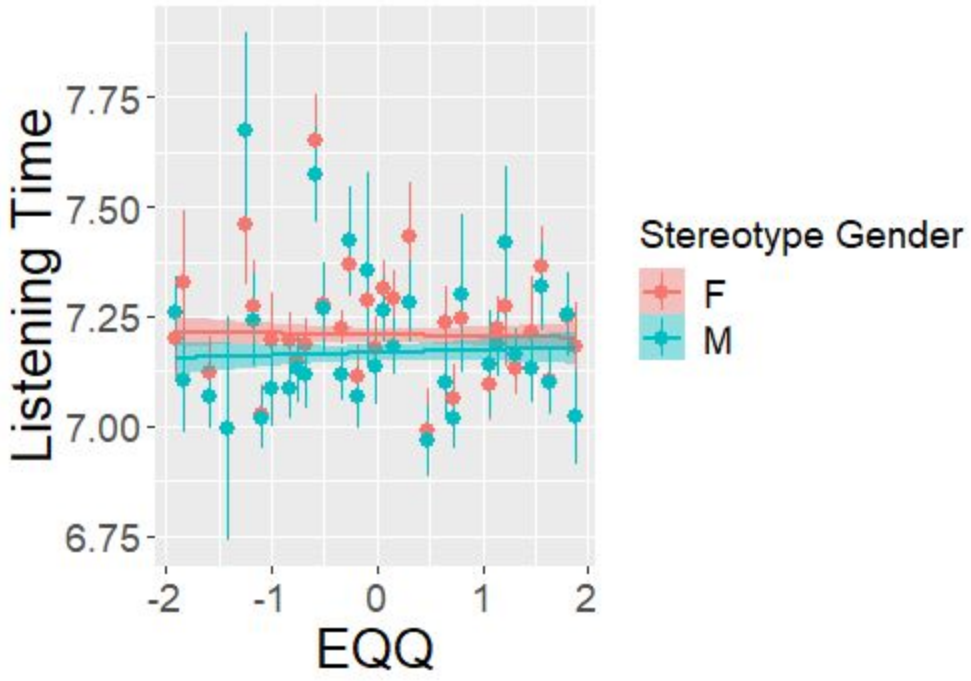

Figure 3.2: Effect of empathy quotient and stereotype gender on listening time of the target pronoun segment.

Finally, there was an effect of Stereotype Gender by Speaker Gender (t = -2.479, p = 0.013; see Figure 3.3). Pairwise comparisons indicated two significant results from this interaction. First, the effect for the stereotype female gender condition with a female speaker significantly differed from the stereotype female gender condition with a male speaker (t = -4.724, p = <0.001). This shows that the female stereotype condition was processed faster with a female speaker than with a male speaker. Second, the stereotype female gender condition with a female speaker was processed faster than the stereotype male condition with a male speaker. (t = -2.870, p = 0.0258). Taken altogether, the significant effects demonstrated that the greatest listening effort occurred during the stereotype gender conditions with a male speaker.

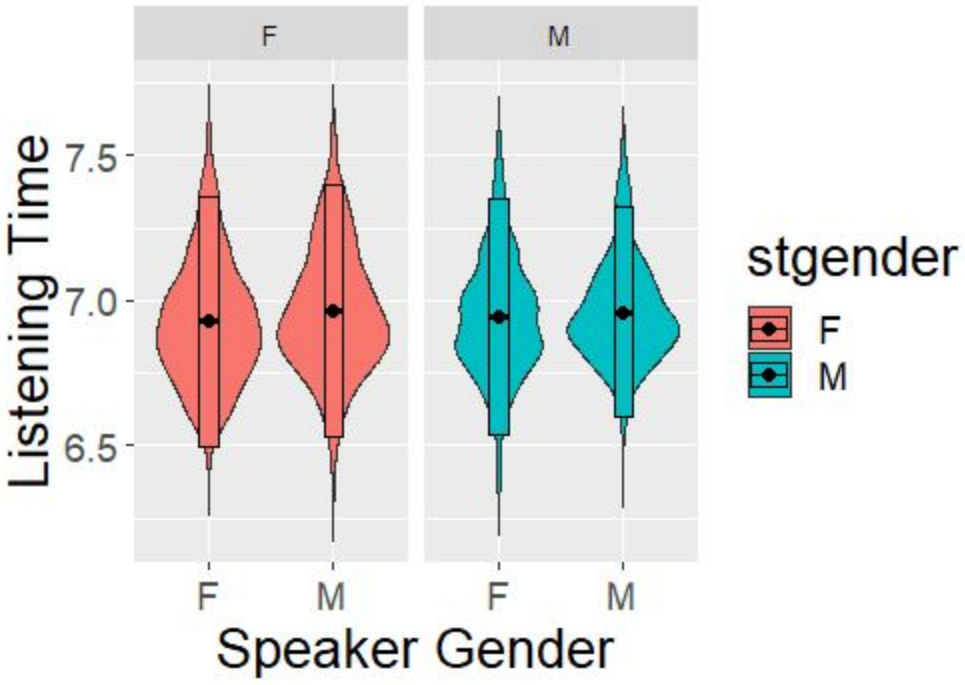

Figure 3.3: Effect of speaker gender and stereotype gender on listening time of target pronoun segment.

3.2 Spillover Segment

The spillover segment is the part of the sentence immediately following the target segment (see Table 2.1 of the methods section). Marrville (2017) found that participants who encounter ambiguity between pronouns take more time to process not only the target segment, but also the segment immediately after (the spillover segment). As a result, we would expect to see an effect of slower listening times on the spillover segment in items with incongruent pronouns with stereotypical gender role nouns. Applying this principle to the present study, we would also expect to continue seeing slower listening times in items with male speaker gender and male stereotype gender (as seen in the target segment).

As shown in Table 3.2, we now observe a significant effect of Congruence to the expected direction ($t = 2.986$, $p = 0.003$), where incongruent items are processed more slowly. There was also a continuing significant trial effect ($t = -9.492$, $p = 0.000$), showing that as the experiment went on, the participants' listening times decreased. We found a significant effect of

male speaker gender (t = 2.6, p = 0.009), where the male speaker conditions were processed more slowly with all other variables held constant.

In the spillover segment, only one significant two-way interaction was found. This interaction was between Congruence and Stereotype Gender (Figure 3.4), where participants processed incongruent stereotype gender conditions significantly slower (t = -2.781, p = 0.005). A pairwise comparison analysis was carried out to further explore this interaction. This comparison resulted in one significant effect: the congruent female stereotype gender conditions were processed faster than the incongruent female stereotype gender conditions in the spillover segment (t = -2.9833, p = 0.0171).

Table 3.2: Summary of linear mixed effects model of the spillover segment.

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	5.52	0.117	2.501.441	47.037	0.000***
Congruence Incongruent	0.032	0.011	145.926	2.986	0.003**
stgenderM	0.051	0.043	61.578	1.2	0.235
speakergender M	0.019	0.007	2.671.017	2.6	0.009**
Trial	-0.037	0.004	2747.6	-9.492	0.000***
RT3log	0.223	0.016	2.759.608	13.733	0.000***
Congruence Incongruent: stgenderM	-0.041	0.015	2.667.981	-2.781	0.005**

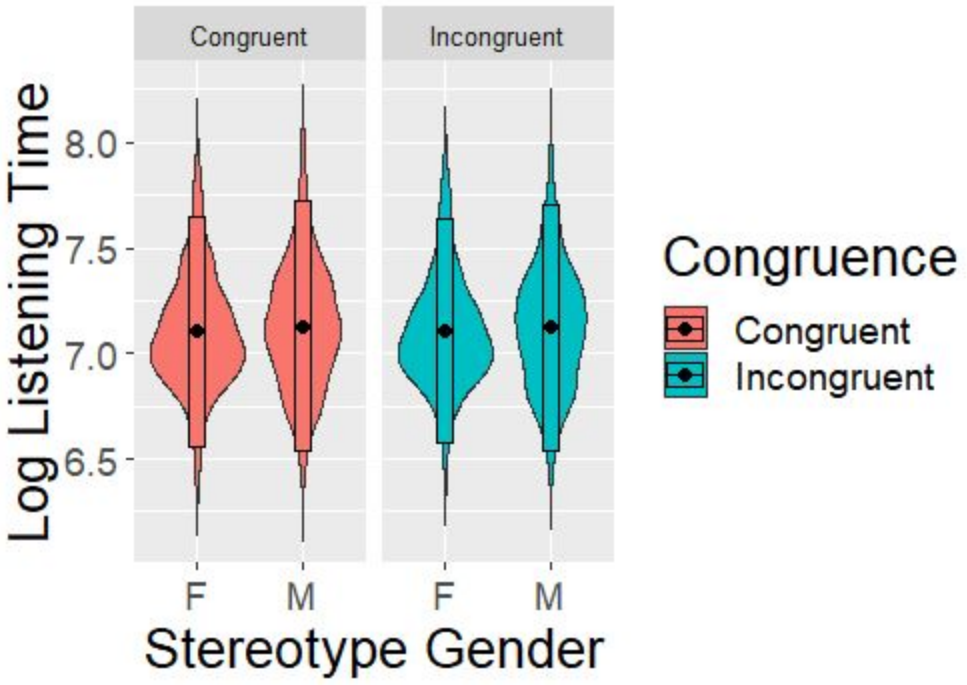

Figure 3.4: Effect of stereotype gender and congruence on listening times of the spillover segment.

3.3 Wrap-up Segment

The wrap-up segment is the last segment of the sentence, and occurs directly after the spillover segment. We included the wrap-up segment in the analyses in order to test for the late integration effects that may arise once the entire sentence had been presented.

Looking at Table 3.3, we can see the summary of the linear mixed effects model for the wrap-up segment. We again found a significant Trial effect ($t = -13.178$, $p = 0.000$), as well as a significant Congruence effect ($t = -2.331$, $p = 0.024$). When held alone, there was no significant effect of political ideology, but there was a significant two-way interaction found between Congruence and Political Ideology ($t = 2.361$, $p = 0.022$; see Figure 3.5). Recall, political ideology here refers to ratings tied to being more progressive leaning or more conservative leaning. Left leaning (more progressive) participants processed incongruent items faster, while right-leaning (more conservative) participants were slower with incongruent items.

Table 3.3: Summary of linear mixed effects model of the wrap-up segment.

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	6.176	0.127	2.761.337	48.801	0.000***
Congruence Incongruent	-0.021	0.009	50.83	-2.331	0.024**
politics	-0.018	0.018	48.091	-1.002	0.321
Trial	-0.057	0.004	2.751.812	-13.178	0.000***
RT3log	0.146	0.018	2.784.214	8.24	0.000***
Congruence Incongruent: politics	0.021	0.009	51.835	2.361	0.022**

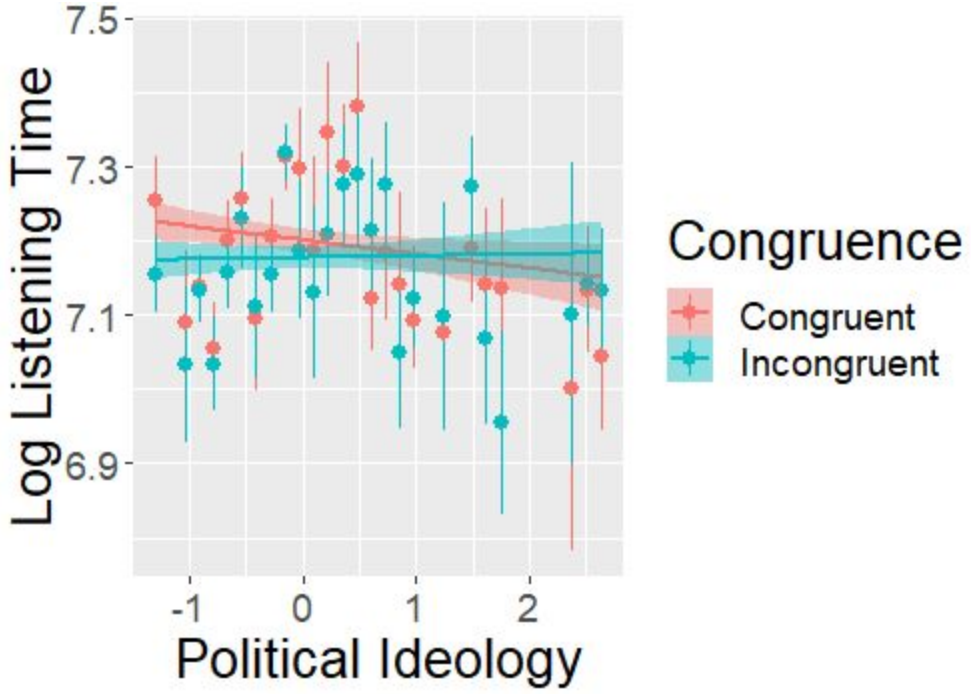

Figure 3.5: Interaction between political ideology and congruence on listening time

Section 4. Discussion

We used listening times to assess an individual's activation of gender stereotypes with role nouns, speaker gender, and congruence in pronoun resolution in a self-paced listening task. In line with existing evidence, the results of this experiment show that world knowledge about gender stereotypes is activated through the use of role nouns, and that a mismatch of

pronoun/role noun gender congruence impacts processing. The results also show that gender stereotypes are applied directly upon hearing the role noun, as encountering the incongruent pronouns in the target segment caused slower listening times. This supports research that individuals may create a mental representation of the sentence, and make predictions about how the sentence will unfold (Carreiras et al., 1996; Esteve-Gilbert et al., 2020; Marrville, 2017; Van den Brink et al., 2012). When incongruent information is encountered, individuals must remodel the representation, resulting in processing delays. Not only this, but we found that the processing of this gender stereotype information is mediated by stereotypes associated with the gender of the speaker, as well as by an individual's empathy ratings and political ideology. These results differed depending on the segments, further supporting a mental representation of stereotype information.

In looking at the results in segments, we saw an asymmetry of the listening times between male and female speakers and gender stereotypes. While we did expect to see violation differences between male and female conditions, opposite effects were seen in the target and spillover segment. In the target segment and spillover segments, the results showed reverse effects between male speaker and male stereotype gender and female speaker and female stereotype gender in their two-way interactions with congruence. The target segment displayed slower listening times for both the congruent female speaker gender and female stereotype gender conditions than the incongruent. However, in the target segment for congruence with male stereotype gender and male speaker gender, slower listening times were seen in incongruent for both. The spillover segment saw a reversed effect, where slower listening times were seen in the incongruent female stereotype gender condition than the congruent condition. Thus, the effect of congruence for female stereotypes emerged later than the effect of congruence for male

stereotypes (for male, slower listening times for incongruent items in the target segment, and for female, slower listening times for incongruent items in the spillover segment). As research has shown a difference in the processing of male and female stereotypes (Van den Brink, 2012), we posit several hypotheses as to why these results came about. These results may show that the male role is possibly more ingrained in an individual's representation, and so could reflect shallow processing when the expected pronoun is *she* over *he,* but *he* is encountered instead. Or rather, this result may reflect the fact the male pronoun *he* and male agents in general are a default, so there is no processing cost until later when the two clauses are integrated into a single representation. This interpretation may further be supported, as the male stereotype gender and speaker violations resulted in the most listening time delays. The male and female conditions differed, in that there were violations for the male in the two-way interactions between male speaker gender and congruence, the two-way interaction between male stereotype gender and congruence, as well as the two-way interaction between speaker gender and stereotype gender in the target segment. However, this reverse effect was only seen in the two-way interaction with stereotype gender and congruence for the females.

Exploring the individual difference measures, the results were also in line with existing evidence. We saw slower listening times for incongruent stereotype gender (particularly the male stereotype gender) with individuals who had higher empathy ratings. Those with higher empathy ratings may access their world views early on, and processing costs are seen when these worldviews are incongruent with the given stimuli, a finding which is also present in (Van den Brink, 2012). This listening time difference may also suggest that participants with higher empathy may spend more time attending to stereotype information in order to make more accurate predictions about upcoming information, and so again see processing costs when

incongruent stereotype gender is encountered (Esteve-Gilbert et al., 2020). Following Marrville (2017), political ideology was also seen to have the predicted effect. Left leaning (more progressive) participants processed incongruent items faster, while right-leaning (more conservative) participants were slower with incongruent items. Interestingly, this effect was seen in the present study to only come in when the entire segment had been presented to the participant (i.e. in the wrap-up segment). This may reflect a late integration for political views. (Hubert & Järvikivi, 2020), looked at the effect of political ideology when measuring pupillary responses of individuals listening to sentences that violate sociocultural expectations about gender (e.g. *I sometimes buy my bras at Hudson's Bay* when spoken by a male). Their results displayed a late effect of political ideology (particularly in more progressive listeners) with these violations. The results reflect a need for the listener to remodel their current representation, but shows that political ideology may come in at a later phase of the integration process. This late stage political ideology effect was also seen in the English-Canadian counterpart (Hammond-Thrasher et al., 2020).

The different interactions between the target, spillover, and wrap-up segments highlight the dynamic process of integrating stereotype information. Through the three segments we were able to show not only that incongruent stereotype information results in delayed processing, but were able elucidate where these effects were occurring to make suggestions about the integration of different types of stereotype information. Overall, we saw the greatest violations with male conditions, which show a possible saliency of male stereotypes in language. There are underlying individual differences; effects that are seen that work together to establish coherence. The results express the variables involved in language processing, and that in looking at them altogether we show a need to further explore the mechanisms behind stereotype processing. In

the future, we hope to explore the social stereotypes elicited through accented speech and its role in possible processing delays. More research is needed on the effect of accented speech, and a contemporary understanding of French-Canadian biases; particularly if they elicit views of conservatism, and taken together with political ideology, whether they play a role in gender stereotyping.

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Appendix A: Experimental Materials

A.1: List of female stereotyped experimental stimuli in self-paced listening task (female stereotyped)

1. The housekeeper washed the sheets because afterwards she/he knew the new guests would be arriving soon.
2. The florist clipped the flowers because creatively she/he arranged the flowers into a bouquet.
3. The beautician applied the eyeliner because adamantly she/he thought the makeup would highlight the client's eyes.
4. The cleaner scrubbed the carpet because wishfully she/he hoped the wine stain would come out.
5. The receptionist answered the telephone because importantly she/he expected the boss to call into the office.
6. The dancer cried after the show because horribly she/he fell off the stage during the finale number.
7. The nanny loaded the children in the van because consistently she/he took them to eat breakfast every morning.
8. The typist transferred the notes into the computer because inconveniently she/he forgot to bring one to the meeting.
9. The model went out for drinks because confidently she/he celebrated the new ad campaign launch success.
10. The cashier cleaned up the mess because unfortunately she/he had dropped a carton of eggs on the floor.
11. The social worker filled out the form because urgently she/he needed to file the paperwork by the end of the day.
12. The servant completed the list of tasks because eagerly she/he wanted to do well at the new job.
13. The prostitute ran to the end of the street because eerily she/he sensed a figure hiding in the shadows.
14. The librarian flipped through the pages of the book because excitedly she/he was not expecting its arrival for a long time.

15. The weaver threw the blanket away because annoyingly she/he sewed the wrong pattern onto the cloth.

16. The dietician recommended supplement pills because sincerely she/he felt they would aid in good health.

17. The opera singer did vocal exercises because sometimes she/he developed problems hitting the high notes.

18. The maid left work early because unexpectedly she/he did not have very much cleaning to do that day.

19. The cheerleader complicated the routine because selfishly she/he liked the attention of the audience.

20. The dressmaker charged extra for the garment because amazingly she/he completed the rush order on short notice.

21. The nurse took a long nap because justifiably she/he worked a double shift that day.

22. The secretary searched for the white out because hastily she/he made a spelling error while taking a message.

23. The psychology student stayed up all night because mistakenly she/he deleted the entire research paper.

24. The childcare worker relaxed at home because thankfully she/he gave a coworker the shift for the day.

25. The fortune teller pulled out the tarot cards because mysteriously she/he predicted a grave future for the patron.

26. The sales assistant ran to the back of the store because unreasonably she/he had to grab extra sizes for the demanding customer

27. The babysitter put the kids to bed early because sneakily she/he invited a friend over to watch a late movie

28. The hairdresser trimmed the hair because necessarily she/he noticed the client had many split ends.

29. The dental assistant emailed out the schedule because dutifully she/he cared about saving on the cost of paper.

30. The au pair finished cooking dinner because afterwards she/he required the children to complete their homework.

A.2: List of experimental stimuli in self-paced listening task (male stereotyped)

1. The boss charged the meal to the company because enthusiastically he/she signed a big client the previous day
2. The butcher wrapped the filet in paper because routinely he/she filled an order for a customer.
3. The carpenter picked up the hammer from the shelf because frustratingly he/she bent the nail and had to try again.
4. The farmer cooked a big feast because celebratorily he/she grew a great yield from the crop this year.
5. The golfer threw the club on the ground because accidentally he/she missed the shot on the last hole.
6. The worker was fired from the job because stupidly he/she stole a lot of money from the boss's safe.
7. The porter unloaded the baggage because unfailingly he/she cared about quickly getting back to the hotel lobby.
8. The judge ordered the maximum sentence because assertively he/she strived to punish the criminal as severely as possible.
9. The plumber managed to dislodge the plug in the sink because astutely he/she used a solvent to dissolve the blockage.
10. The soldier saluted the officers because patriotically he/she believed in the freedom they fought for.
11. The firefighter ran back into the burning building because courageously he/she swore to save everybody from the blaze.
12. The pilot listened to the cheers of the passengers because safely he/she landed the plane against all odds.
13. The chauffeur closed the partition in the car because appropriately he/she provided the client with some privacy.
14. The engineer went over the plans because cautiously he/she maintained a high standard of safety.
15. The grave digger quickly exhumed the coffin because animatedly he/she finally was able to take the expensive family ring.
16. The sailor took advantage of the time off because reluctantly he/she sailed off on a new deployment in the morning.
17. The surgeon closed up the incision because luckily he/she realized the risky operation had been a success.
18. The president changed his stance on the bid because regrettably he/she restricted basic human rights with the policy.
19. The police officer checked over the work of the employees because plainly he/she suspected one of them to be slacking.

20. The truck driver swerved off the road because scarily he/she began to fall asleep at the wheel.
21. The doctor was thanked profusely because deftly he/she stitched up the cut on the patient's face.
22. The politician delivered the concession speech because soon he/she assumed the scandal would be exposed.
23. The mechanic closed the shop for the weekend because laboriously he/she repaired numerous car issues that week.
24. The accountant filed the tax receipts because smartly he/she received a higher tax deduction because of them.
25. The construction worker rebuilt the wall because diligently he/she decided the structural flaws needed to be fixed.
26. The electrician wore gloves while working because cleverly he/she sought protection from electrocution from the wires.
27. The undertaker uncovered the casket because unenthusiastically he/she prepared for the funeral service that day.
28. The technician rebooted the computer because embarrassingly he/she accidentally downloaded a virus to the server.
29. The taxi driver opened the trunk for the passenger because nicely he/she accounted for the suitcase the passenger had.
30. The physics student rechecked the formula because questioningly he/she surmised it was the reason the method was not working.

A.3: List of fillers used in self-paced listening task

1. The lawyer reviewed the details of the case because hopefully he/she would find a loophole in the law.
2. The musician tuned the guitar because earlier he/she clearly noticed that the sound was not right.
3. The newscaster took off the microphone because already he/she finished reporting all of the daily news.
4. The pediatrician moved up the surgery because wholeheartedly he /she considered the child's condition to have worsened.
5. The pedestrian looked both ways before crossing the street because intelligently he/she remembered the safety lessons from childhood.
6. The concert goer drank some water because happily he/she danced heavily to each song of the set.
7. The interpreter summarized the conversation because coincidentally he/she spoke fluent Mandarin on top of French.

8. The journalist backed up the files because otherwise he/she feared the articles could be lost if the computer crashed.
9. The tennis player retrieved the ball because deliberately he/she swung the racket harder than expected.
10. The spectator sat on the edge of the seat because anxiously he/she worried the favored team would lose the game.
11. The neighbor called the police because angrily he/she decided the party next door was too loud.
12. The student arrived late to class because inadvertently he/she slept through the alarm that morning.
13. The physiotherapist went over the exercise plan because unshakably he/she insisted that without it the client would not recover.
14. The artist signed the bottom of the painting because potentially he/she could see the finished work selling for a high bid.
15. The writer sealed the novel in a safe because neuroticaly he/she suspected someone would try to steal the idea of the book.

A.4: List of comprehension questions

1. Did the housekeeper wash the sheets?
2. Did the beautician apply the foundation?
3. Did the dancer fall off the stage?
4. Did the typist fill out the form?
5. Did the dietician recommend the supplement pills?
6. Did the cashier drop the bananas?
7. Did the model celebrate the campaign?
8. Did the psychology student go to bed early?
9. Did the au pair cook the children's dinner?
10. Did the hairdresser dye the client's hair?
11. Did the cleaner try to get the stain out of the carpet?
12. Did the rock star complete vocal exercises?
13. Did the cheerleader like the attention of the audience?
14. Did the childcare worker work a double shift?
15. Did the boss sign a big client?
16. Did the butcher wrap the sirloin in paper?

17. Did the politician concede the election?
18. Did the porter take a long break?
19. Was the worker fired from the job?
20. Did the electrician suffer from electrocution?
21. Did the technician download a virus to the computer?
22. Did the gravedigger find an expensive necklace?
23. Did the truck driver fall asleep at the wheel?
24. Did the mechanic work all weekend?
25. Did the firefighter save everybody from the blaze?
26. Did the sailer sail off on a new deployment that evening?
27. Did the physics student recheck the formula?
28. Did the golfer win the tournament?
29. Did the plumber dissolve the blockage?
30. Did the lawyer win the case?
31. Did the musician tune the guitar?
32. Was the pedestrian hit by a car?
33. Did the newscaster report all of the news?
34. Did the interpreter speak Japanese and Mandarin?
35. Did the neighbor call the police?
36. Did the journalist lose all the files?
37. Did the concert goer dance to the music?
38. Did the student arrive to class early?
39. Did the artist sign the bottom of the painting?
40. Did the badminton player swing the racket harder than expected?
41. Did the writer seal the novel in a safe?
42. Did the spectator leave the game early?
43. Did the physiotherapist go over the exercise plan?
44. Did the pediatrician cancel the surgery?

Appendix B: Post-tests

B.1: Items in French-Canadian Language Background Questionnaire

1. Gender
2. Age
3. Do you consider yourself a native speaker of English?
4. What is your native language, if it is not English.
5. For the following, provide an answer from 1 (beginner), to 5 (advanced).
    a. English Language Proficiency
    b. English Writing Proficiency
    c. English Speaking Proficiency
6. Please indicate all other languages you know and rate yourself as beginner, intermediate, or advanced. For example: "Mandarin-advanced, German-beginner"
7. For the following, provide an answer from 1 (infrequently), to 5 (frequently)
    a. How often do you interact with non-native speakers of English?
    b. How often do you read scholarly articles in English?
    c. How often do you read novels in English?
    d. How would you rate your reading speed in English?
    e. How would you rate your English vocabulary?

B.2: Items in the EQQ

1. For every response, provide an answer from 1 (definitely disagree) to 4 (definitely agree)
    1. I would be very upset if I couldn’t listen to music every day.
    2. I prefer to speak to my friends on the phone rather than write letters to them.
    3. I have no desire to travel to different parts of the world.
    4. I prefer to read than dance.
    5. I can easily tell if someone wants to enter a conversation.
    6. I prefer animals to humans.
    7. I try to keep up with the current trends and fashions.
    8. I find it difficult to explain to others things I understand easily, when they don't understand it the first time.
    9. I dream most nights.

10. I really enjoy caring for people.
11. I try to solve my own problems rather than discussing them with others.
12. I find it hard to know what to do in a social situation.
13. I am my best first thing in the morning.
14. People often tell me that I went too far in driving my point home in a discussion.
15. It doesn't bother me much if I am late meeting a friend.
16. Friendships and relationships are just too difficult, so I tend not to bother with them.
17. I would never break a law, no matter how minor.
18. I often find it difficult to judge if something is rude or polite.
19. In a conversation, I tend to focus on my own thoughts rather than on what my listener might be thinking.
20. I prefer practical jokes to verbal humour.
21. I live life for today rather than the future.
22. When I was a child, I enjoyed cutting up worms to see what would happen.
23. I can pick up quickly if someone says one thing but means another.
24. I tend to have very strong opinions about morality.
25. It is hard for me to see why some things upset people so much.
26. I find it easy to put myself in somebody else's shoes.
27. I think that good manners are the most important thing a parent can teach their child.
28. I like to do things on the spur of the moment.
29. I am good at predicting how someone will feel.
30. I am quick to spot when someone in a group is feeling awkward or uncomfortable.
31. If I say something that someone else is offended by, I think that that's their problem, not mine.
32. If anyone asked me if I liked their haircut, I would repeat truthfully, even if I didn't like it.
33. I can't always see why someone should have felt offended by a remark.
34. People often tell me that I am unpredictable.

35. I enjoy being the center of attention at any social gathering.
36. Seeing people cry doesn't really upset me.
37. I enjoy having discussions about politics.
38. I am very blunt, which some people take to be rudeness, even though it is unintentional.
39. I don't find social situations confusing.
40. Other people tell me I am good at understanding how they are feeling and what they are feeling.
41. When I try to talk to people, I tend to talk about their experiences rather than my own.
42. It upsets me to see an animal in pain.
43. I am able to make decisions without being influenced by people's feelings.
44. I can't relax until I have done everything I planned to do that day.
45. I can easily tell if someone else is interested or bored in what I am saying.
46. I get upset if I see people suffering on news programs.
47. Friends usually talk to me about their problems as they say that I am very understanding.
48. I can sense if I am intruding, even if the other person doesn't tell me.
49. I often start new hobbies, but quickly become bored with them and move on to something else.
50. People sometimes tell me I have gone too far with teasing.
51. I would be too nervous to go on a big rollercoaster.
52. Other people say that I am insensitive, though I don't always see why.
53. If I see a stranger in a group, I think it is up to them to make an effort to join in.
54. I usually stay emotionally detached when watching a film.
55. I like to be very organized in day-to-day life and often make lists of the chores I have to do.
56. I can tune into how someone else feels rapidly and intuitively.
57. I don't like to take risks.
58. I can easily work out what another person might want to talk about.
59. I can tell if someone is masking their true emotion.

60. Before making a decision, I always weigh pros and cons.
61. I don't consciously work out the rules of social situations.
62. I am good at predicting what someone will do.
63. I tend to get emotionally involved with a friend's problems.
64. I can usually appreciate the other person's viewpoint, even if I don't agree with it.

B.3: Items in the HEXACO

1. For the following, provide a response on a scale from 1 (strongly disagree) to 5 (strongly agree)

1. I would be quite bored to visit an art gallery.
2. I plan ahead and organize things, to avoid scrambling at the last minute.
3. I rarely hold a grudge, even against people who have badly wronged me.
4. I feel reasonably satisfied with myself overall.
5. I would feel afraid if I had to travel in bad weather conditions.
6. I wouldn't use flattery to get a raise or promotion at work, even if I thought it would succeed.
7. I'm interested in learning about the history and politics of other countries.
8. I often push myself very hard when trying to achieve a goal.
9. People sometimes tell me that I am too critical of others.
10. I rarely express my opinions in group meetings.
11. I sometimes can't help worrying about little things.
12. If I knew that I could never get caught, I would be willing to steal a million dollars.
13. I would enjoy creating a work of art, such as a novel, a song, or a painting.
14. When working on something, I don't pay much attention to small details.
15. People sometimes tell me that I'm too stubborn.
16. I prefer jobs that involve active social interaction to those that involve working alone.
17. When I suffer from a painful experience, I need someone to make me feel comfortable.
18. Having a lot of money is not especially important to me.

19. I think that paying attention to radical ideas is a waste of time.
20. I make decisions based on the feeling of the moment rather than on careful thought.
21. People think of me as someone who has a quick temper.
22. On most days, I feel cheerful and optimistic.
23. I feel like crying when I see other people crying.
24. I think that I am entitled to more respect than the average person is.
25. If I had the opportunity, I would like to attend a classical music concert.
26. When working, I sometimes have difficulties due to being disorganized.
27. My attitude toward people who have treated me badly is "forgive and forget."
28. I feel that I am an unpopular person.
29. When it comes to physical danger, I am very fearful.
30. If I want something from someone, I will laugh at that person's worst jokes.
31. I've never really enjoyed looking through an encyclopedia.
32. I do only the minimum amount of work needed to get by.
33. I tend to be lenient in judging other people.
34. In social situations, I'm usually the one who makes the first move.
35. I worry a lot less than most people do.
36. I would never accept a bribe, even if it were very large.
37. People have often told me that I have a good imagination.
38. I always try to be accurate in my work, even at the expense of time.
39. I am usually quite flexible in my opinions when people disagree with me.
40. The first thing that I always do in a new place is to make friends.
41. I can handle difficult situations without needing emotional support from anyone else.
42. I would get a lot of pleasure from owning expensive luxury goods.
43. I like people who have unconventional views.
44. I make a lot of mistakes because I don't think before I act.
45. Most people tend to get angry more quickly than I do.

46. Most people are more upbeat and dynamic than I generally am.
47. I feel strong emotions when someone close to me is going away for a long time.
48. I want people to know that I am an important person of high status.
49. I don't think of myself as the artistic or creative type.
50. People often call me a perfectionist.
51. Even when people make a lot of mistakes, I rarely say anything negative.
52. I sometimes feel that I am a worthless person.
53. Even in an emergency I wouldn't feel like panicking.
54. I wouldn't pretend to like someone just to get that person to do favors for me.
55. I find it boring to discuss philosophy.
56. I prefer to do whatever comes to mind, rather than stick to a plan.
57. When people tell me that I'm wrong, my first reaction is to argue with them.
58. When I'm in a group of people, I'm often the one who speaks on behalf of the group.
59. I remain unemotional even in situations where most people get very sentimental.
60. I'd be tempted to use counterfeit money, if I were sure I could get away with it.

B.4: Items in the Political Ideology Questionnaire

1. For the following, provide a response on a scale from 1 (for) to 6 (against):
    a. Prayer in schools
    b. Abortion
    c. Cuts to welfare programs
    d. National healthcare
    e. Sex education in elementary schools
    f. Gun control
    g. Stronger labour unions
    h. Contraception

i. Food stamp programs
j. Same-sex marriage
k. Aid/care for the homeless
l. Minimum wages
m. Political correctness
n. Racial quotas in the workplace
o. Capital punishment

2. For the following statements, provide a response on a scale from 1 (strongly disagree) to 5 (strongly agree)

a. It is better to keep things the way they are
b. People are essentially selfish; they need to be controlled
c. Individuals have free will; they are responsible for their own lives and problems
d. The traditional family must be preserved at all costs
e. Government regulations are needed to control monopolies
f. A free market economy is the best way to ensure prosperity and fulfillment of individual needs
g. Sometimes revolutions are necessary
h. This country would be better off if most government programs were eliminated
i. People are basically good but can be corrupted
j. The free market economic system is basically exploitative and inherently unfair to working people
k. Helping the poor encourages laziness
l. If the rich continue to get richer and the poor continue to get poorer, I would support a violent revolution to correct the inequality