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Effect of Speaker Age and Dialect on Listener Perceptions of Personality

Brittni Elizabeth Bergstrom

A thesis submitted to the faculty of
Brigham Young University
in partial fulfillment of the requirements for the degree of
Master of Science

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ABSTRACT

Effect of Speaker Age and Dialect on Listener Perceptions of Personality

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Master of Science

The association between dialect and perceived personality traits has been studied for a number of years. The purpose of this study was to examine how the dialect, the gender of both the speaker and the listener, and the perceived age of the speaker affected the listeners' perception of the speaker's personality. The spontaneous speech samples were drawn from existing corpora. There were 48 speakers, 24 New Zealanders and 24 Utahns. Each dialect group was stratified into three age groups (young, middle, older), and within each age group there were an equal number of males and females. The listener group included 40 adults aged 18-30, 20 females and 20 males. The listeners used a computerized visual analog scale to rate the samples on four personality traits: credibility, confidence, prestige, and pleasantness. They also estimated the age of each speaker. Statistical analysis demonstrated that there were several significant differences in how listeners rated the speakers. Main effects of speaker dialect, speaker age, and speaker and listener gender were observed in age estimation as well as personality perception. The results suggest that listeners' perceptions of personality traits are influenced by the speaker's age, dialect, and gender. Additionally, male and female listeners differed significantly on several measures. The findings of this study demonstrate that speaker dialect and listener gender can influence listener perceptions.

Keywords: personality traits, dialect, age perception, gender

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DESCRIPTION OF THESIS STRUCTURE

This thesis, *Effect of Speaker Age and Dialect on Listener Perceptions of Personality*, is part of a larger research project. The audio stimuli and rating tools used in this study will be used by Dr. Annalise Fletcher, a researcher at the University of Canterbury in Christchurch, New Zealand. In her part of the study the listeners will be New Zealanders instead of Americans. The findings from the joint studies will be published as a collective article. An annotated bibliography is included in Appendix A, which summarizes background research that supports the rationale for this study.

Introduction

For many years, researchers have been investigating the kinds of personality traits that are associated with vocal qualities and dialects. Upon meeting an individual, listeners make several instant judgments and form impressions based on a variety of factors. These can include vocal quality, pitch, timbre, loudness, nasality, rate, and fluency. Since the seminal work of Lambert, Hodgson, Gardner, and Fillenbaum (1960), researchers have been studying how vocal characteristics of the speaker affect judgments made by the listener. In their study, they used the matched-guise method, which involved having a bilingual speaker read the same passage in both of their fluent languages (i.e., English and French). When both English and French listeners rated the samples, the English guise was consistently attributed with traits that were categorized as being highly desirable. This initial finding was revolutionary and became the catalyst for years of research into how speech affects our impressions.

The American Psychological Association (APA) defines personality as the individual differences in characteristic patterns of thinking, feeling, and behaving. Over decades of research, a variety of personality traits have been selected during vocal perception studies. The most common dimensions of personality have included solidarity, competence, status, integrity, attractiveness, power, and benevolence (Bayard & Green, 2005; Brown, Strong, & Rencher, 1973; Eisenchlas & Tsurutani, 2011; Riches & Foddy, 1989; Smith, Brown, Strong, & Rencher, 1975; Watanabe, 2008). Each trait that has been analyzed has given insight into the judgment applied to others based on their speech. Personality states and traits differ based on the consistency and temporal nature of the characteristic. A personality state is generally temporary and is often the result of a major life event, whereas a personality trait is central to an individual's overall disposition and makeup and is more consistent in nature. The previously mentioned studies have aimed to analyze the personality

traits that have been perceived by listeners, as opposed to the states. Likewise, the focus of the present study is on the foundational character of an individual that is perceived by a listener through speech alone.

A wide variety of stimuli have been used to identify how much speech is required for a listener to make uniform personality judgments of a speaker. Researchers have found that the presentation of five consecutive vowels was enough for listeners to make consistent judgments on the perception of a speaker's pleasantness (Bruckert, Liénard, Lacroix, Kreutzer, & Leboucher, 2006). In another study, researchers used the single word *hello* and found high levels of reliability in perceptual judgments (McAlear, Todorov, & Belin, 2014). These findings demonstrate that only a small amount of auditory information is needed for a listener to make judgments about the speaker. Stereotypes become ingrained into listeners over time and have the potential to carry over into the kind of character judgments they equate with the speech they hear.

It is equally important to consider the effect that semantics have on a listener's perception. Heaton and Nygaard (2011) found that in some cases, the passage content overrode dialect perception when listeners were making attitude judgments about the speakers. Their study examined the perceived differences between Standard American English (SAE) and Southern-accented speakers. Interestingly, they found that when an SAE speaker changed the content of their passage, the listener's perception of them changed as well. However, this was not true for Southern-accented speakers, who were consistently rated lower in status than the SAE speakers. Even when their speech included more sophisticated topics, the listeners did not rate the Southern-accented speakers higher in status. In general, the SAE dialect was favored over a Southern accent in terms of status. Thus, passage content and speaker accent both influenced listener perceptions significantly.

Researchers have often turned their attention to the vocal parameters that may influence listener perceptions of personality. Rosenberg and Hirschberg (2009) examined how charisma was perceived in both speech and text. They used addresses from Democratic presidential nominees and selected samples from their live broadcasts for listeners to rate levels of charisma. The researchers found that intensity, fundamental frequency, and speaking rate were the primary acoustic measures that were consistently associated with judgments of charisma. Other studies have also documented correlations between acoustic measures and perceptions of a speaker's personality (Brown, Strong, & Rencher, 1973; Bruckert, Liénard, Lacroix, Kreutzer, & Leboucher, 2006; Markel, Phillis, Vargas, & Howard, 1972; Smith, Brown, Strong, & Rencher, 1975). The main characteristics of speech that accounted for these correlations included vocal quality (e.g., breathy, tense, nasal, throaty, etc.), speech rate, and fundamental frequency.

Researchers have found that listeners can identify speaker dialects and that dialects have the potential to influence a listener's perceptions of a speaker. Additionally, they have found that the ethnic makeup of a geographical area can influence how accents are perceived (Purnell, Idsardi, & Baugh, 1999). Depending on the socioeconomic context of a geographical area, listeners responded more favorably to certain dialects. For example, individuals in predominantly white neighborhoods exhibited the strongest bias against speakers who use a nonstandard dialect. This research highlighted the potential influence of local culture on listener attitudes.

Another important facet of this line of research is how perceptions of accented-speech affect behavior in social settings. Often, a listener makes judgments based on the accent of the speaker that do not affect their interactions with them. However, in a professional setting, the character judgments made about an individual based on his or her speech have the potential to affect the social dynamic. Riches and Foddy (1989) found that in a group-task setting, speakers

using an Anglo-Australian accent were consistently judged to be more competent when compared to speakers using a Greek-Australian accent. Despite there being two listener groups with two distinct accent backgrounds, they both made similar character judgments based on attitudes towards the accents they perceived. This supports the notion that listeners often infer certain traits based on accents.

An additional factor to consider is whether familiarity with a certain accent has the potential to influence listeners' perceptions of accented speech. Eisenclas and Tsurutani (2011) found that listeners who shared the same accent as the speaker were more likely to rate them more favorably in terms of competence, integrity, and attractiveness. Additionally, when listeners could accurately identify the accent they were more likely to rate it more favorably. These findings support the idea that a listener's background can potentially have a significant impact on how they perceive others. A listener's accent background has also been shown to impact their ability to identify speaker accents. Nonnative English speakers were generally poorer at correctly identifying speaker accents (Ikeno & Hansen, 2007).

Previous studies (Bayard & Green, 2005; Bayard, Weatherall, Gallois, & Pittam, 2001) have shown that New Zealand listeners have consistently rated the North American English (NAE) accent higher in status. However, Watanabe (2008) reported contradictory results. He found that when New Zealand listeners were presented with both NAE and New Zealand English (NZE) speakers, the New Zealand accent was consistently rated as having more prestige and favorability. A recent meta-analysis (Fuertes, Gottdiener, Martin, Gilbert, & Giles, 2012) of the effect of speaker accent demonstrated that when listeners perceive a foreign or minority accent, they are more likely to perceive the speaker as lower in status, solidarity, and dynamism. In general, the researchers found that widely varying attitudes exist towards individuals who speak with a standard

or nonstandard accent. Standard accent speakers were rated more positively than speakers with nonstandard accents. The researchers also found that standard-accented speakers were consistently rated higher in the categories of solidarity, status, and dynamism, when compared to nonstandard-accented speakers. Additionally, the American accent was rated higher than the Received Pronunciation (RP) accent (i.e., the standard English accent used in the United Kingdom), running contrary to the researchers' hypothesis.

Not only does a listener's accent background influence the perception of accents, but so does the age of the listener. Giles (1970) found that the age of the listener (particularly in adolescents) strongly influenced the stereotypes they associated with accents as well as their perception of personality traits. The older age group of participants (i.e., 17-year olds) were more reliable at identifying accents than the younger age group (i.e., 12-year olds). When compared, each age group made significantly different judgments based on the accent of the speaker.

Several studies have examined how well listeners can estimate the ages of speakers. Hunter, Ferguson, and Newman (2016) conducted a meta-analysis to examine the accuracy of age estimation for English speakers. For each data set in the meta-analysis, the perceived age was calculated, as well as the average difference between the perceived and chronological age. This study found that listeners were relatively successful at identifying the speaker's age, most notably around the age of 50. The most accurate age estimation occurred between the ages of 35 and 55. Between these ages, there was an absolute age estimation difference of roughly six years. The average perceived age of speakers between the ages of 45 and 55 was estimated within three years of the average chronological age. However, between the ages of 85 and 90, there was an absolute age estimation difference of more than 11 years. In general, listeners overestimated younger speakers' ages and underestimated older speakers' ages. In another study, when exposed to New

Zealand English speech samples, listeners with a wide variety of accent backgrounds could estimate the New Zealand speakers' age within three years (Watanabe, 2008).

When an individual hears someone speak for the first time, either face-to-face or over the telephone, the listener subconsciously forms impressions based on several factors. The investigation of impressions is important because human intuition, however biased it may be, affects the daily interactions that occur. A study by Purnell et al. (1999) demonstrated why this was important. In this study, a single speaker used three distinct dialects when trying to gain an initial appointment to see an apartment for rent over the phone. They found that the SAE accent was consistently favored over the other accents and more return appointments were offered. Those he spoke to over the telephone likely made judgments and attributed character traits to him based on his dialect. This demonstrates just how powerfully stereotypes can impact social interactions. The way an individual is perceived ultimately affects how they are treated in society.

It is important to be aware that people make snap judgments based on the voice and dialect used by a speaker. The age of a speaker has the potential to influence how a listener perceives them as well. For example, in East Asian countries the elderly are honored and respected for their age. "Elder respect remains a central value and feelings of respect and obligation do remain to bind generations together" (Sung, 2001, p. 21). Primarily based on religious beliefs, elderly individuals in their culture are generally respected and revered for their wisdom and authoritative attributes. The age of an individual is a significant aspect of their identity. Age groups may have certain attributes associated with them, and can in turn affect how they are treated. For example, younger people may be perceived as more innovative, whereas older individuals may be perceived as wiser. Since societies differ on how they view different age groups, the present study seeks to clarify whether speaker age and dialect influence the perception of personality traits. If it is found that

there are consistent personality judgments based on the estimation of age and accent type, this could inform the practice of speech-language pathology in several ways. With the world becoming ever more diverse, and multicultural interactions being the rule rather than the exception, it is becoming more important than ever to be aware of implicit biases that may exist. Speech-language pathologists can become more effective in their work as they consider individuals who come from different backgrounds and how their speech impacts a listener's perceptions of them.

The purpose of the current study is to determine if there is consistency across listeners in evaluating speaker traits. Following the completion of this study, a group of researchers in New Zealand will conduct the same experiment, but use different listeners as participants. While the present study used Utah natives as the listeners, the companion study will use New Zealand natives instead. Placing the current study in the larger context of a multicultural setting allows for the study to demonstrate either consistent or conflicting listener perceptions across regions. There are five main goals of the current study. The first objective is to determine if native listeners are more consistent at identifying the age of a native speaker when compared to foreign speakers. In essence, does accented speech affect one's ability to accurately estimate the age of a speaker? The second objective is to determine if listener gender has influence on the perception of personality traits. The third objective is to determine if personality traits are consistently attributed to different dialects. We are interested in identifying the perceived traits that a speaker's dialect elicits in a listener. The fourth objective is to examine the effect that perceived age has on the perception of personality traits based on speech. Essentially, do certain age groups have particular personality traits associated with them? The final objective is to examine if speaker gender has an impact on the listener's perception of personality traits.

Method

Participants

The listener group consisted of 20 males and 20 female participants with an age range of 18-30 years. All participants were recruited from Brigham Young University or neighboring local areas. Each participant was compensated with five dollars for completing the experiment. All participants passed a pure-tone air-conduction hearing screening at 20 dB HL. They were native SAE speakers with no reported history of speech or language disorders. Appendix B contains a consent form approved by the university Institutional Review Board, which each listener signed.

Stimuli

The stimuli for each participant consisted of 55 samples of spontaneous speech. Half of the samples came from individuals who spoke SAE (i.e., Utah speakers) and half from individuals who spoke NZE. The Utah speech samples were previously collected for use in another research project. The purpose of the previous Utah study was to examine a variety of acoustic metrics that differ with age, gender, and familial association. The speakers belonged to 40 large Utah families with a wide range of ages (Westrop, 2000). The New Zealand speech samples were gathered from individuals who had survived a massive earthquake. They subsequently reported their experiences in what is known as the *Quakebox*, a portable recording studio that had been built directly into a shipping container. These speech samples were originally gathered for a sociolinguistic study (Clark, MacGougan, Hay, & Walsh, 2016).

Each passage presented to the listeners was 14-20 s in length and produced in a natural speaking context. The samples were stratified by age, gender, and accent, with an equal number of each category being included in the samples. The three age groups included young (18-29 years), middle (36-49 years), and older (56-67 years). For each accent group, four women and four men

were included in each of the three age groups. This resulted in a total of 48 unique samples and seven of these were randomly selected to be presented a second time. Thus, each listener heard a total of 55 samples. The seven repeated samples were used to establish intrarater reliability. The researcher listened to all of the audio samples and determined that each speaker's vocal quality was within normal voice limits. The stimuli were presented through headphones at a self-selected comfortable volume, and the randomized presentation sequence was different for each listener.

Procedure

Spontaneous speech samples were selected for the study because they are more reflective of what a person hears each day, as opposed to repetitive samples targeting specific phonetic elements. Because the two sets of recordings were made under different circumstances, the perceived emotionality levels of the samples were rated by listeners to determine whether this might influence the personality trait ratings. The UT speech samples were collected with the speakers talking about their happiest day ever and the NZ speakers reported their experiences following a recent earthquake. Due to this substantial disparity, emotionality in the samples was considered as a potentially confounding factor. Therefore, five listeners who were not part of the main study rated each speech sample for perceived emotionality levels using a sliding scale ranging from *low* to *high*. A univariate ANOVA test found no main group differences in the ratings of emotionality between the NZ and UT speech samples. This preliminary procedure informed the findings of the study by establishing that the emotionality levels between the two dialectic groups were equivalent. Therefore, it can be assumed that the perceived emotional levels of the speaker groups would not have influenced the listeners' perceptions significantly.

Prior to the experiment, each participant was informed that they would be hearing speech samples that would differ in accent. They were also informed that they would only hear the speech

The image shows a Matlab application window titled "Rating Form". The main content area has a light beige background and is titled "personality traits". It contains four horizontal sliders, each representing a different personality trait. Each slider is labeled "low" on the left and "high" on the right. The traits and their sub-labels are: "credibility (trustworthiness)", "confidence (self-assurance)", "prestige (status)", and "pleasantness (likeability)". Below the sliders, there is a text input field labeled "estimated age" and a "save rating" button.

Rating Form

personality traits

low < [slider] > high
credibility
(trustworthiness)

low < [slider] > high
confidence
(self-assurance)

low < [slider] > high
prestige
(status)

low < [slider] > high
pleasantness
(likeability)

estimated age

save rating

Figure 1. Matlab application interface.

sample once and would be required to rate the speaker with regard to four personality dimensions. The four personality dimensions included: credibility, confidence, prestige, and pleasantness. A single synonym for each trait was provided to promote consistency of interpretation. A custom Matlab application was used by the listeners to rate each speaker. Figure 1 shows the screen each participant viewed during the experiment. Participants were instructed to base their ratings on the way each person spoke, instead of the words they were using. A sliding scale was used to rate the speech samples on each of the four personality characteristics. The scale ranged from *low* to *high*. The listeners only heard the stimulus once, but could decide how long they took to rate the recording before moving onto the next sample. In addition to making the personality ratings, each participant also estimated the age of each speaker in years.

Statistical Analysis

The intrarater reliability of the listeners was established using correlations. The speech sample set included 48 unique samples and seven repeated samples, which allowed for a 13% reliability sample. The number of stimuli overall was selected to provide sufficient repeated ratings to compute reliability without unnecessarily extending the listening task and risking listener fatigue. Pearson correlations between the original and repeated samples reflected how consistently the listeners rated the speech sample when they heard it a second time. If a correlation of .6 or above was found, the ratings for that personality trait were included in the subsequent analyses. If the correlation was lower than .6, then each of the seven repeat samples were reviewed. If two or more of the seven repeat samples differed by 30 or more points on a trait, then the ratings for that trait were discarded for that listener. Eight credibility, eight confidence, two prestige, and six pleasantness ratings did not meet these requirements and were excluded from the statistical analyses. Seven of the eight deleted credibility ratings were for

female listeners. Similarly, six of the eight deleted confidence ratings were female listeners as well. Descriptive statistics were computed from the remaining listeners' ratings of the recorded speech samples. An intraclass correlation coefficient (ICC) was computed to measure interrater agreement. The average measures ICC for age was .993, $p < .001$, .827, $p < .001$ for credibility, .913, $p < .001$ for confidence, .892, $p < .001$ for prestige, and .859, $p < .001$ for pleasantness.

Results

A repeated measures ANOVA was used to test for differences between male and female listener estimates of age and ratings of personality traits. Because both men and women rated the same audio samples, listener gender was the within-subjects factor in the ANOVA, and each audio sample was the subject or observation being tested. Between-subject factors were included to test for speaker differences in dialect, age, and gender. A Tukey's post hoc test was performed to identify significant differences between speaker age groups.

Age

There was a significant main effect for listener gender, $F(1, 36) = 5.946$, $p = .020$, $\eta^2 = .142$. Female listeners tended to perceive the age of the speaker as younger than the male listeners. The significant interaction between listener gender and speaker gender, $F(1, 36) = 5.402$, $p = .026$, $\eta^2 = .130$, was based on female listeners rating female speakers younger than the male listeners, but when estimating the age of the male speakers, there was no clear listener gender difference. Additionally, there was a significant interaction between listener gender and speaker age group, $F(2, 36) = 3.958$, $p = .028$, $\eta^2 = .180$. Female listeners estimated the young- and middle-aged speakers as younger than the male listeners. Tests of between-subjects effects revealed main effects for speaker dialect, $F(1, 36) = 32.474$, $p < .001$, $\eta^2 = .474$, and speaker age group, $F(2, 36) = 92.123$, $p < .001$, $\eta^2 = .837$. Regarding speaker dialect, the UT speakers were

consistently perceived as being older than the NZ speakers. The main effect of speaker age group showed that younger speakers were perceived as younger and older speakers as older. There was a speaker gender by speaker age group interaction, $F(2, 36) = 4.639, p = .016, \eta^2 = .205$, where the female speakers in the middle and older groups were given more similar age estimates when compared to the young group. In contrast, the male speakers in the young and middle-age groups were given more similar age estimations when compared to the older group. There was a speaker dialect by speaker age group interaction, $F(2, 36) = 6.520, p = .004, \eta^2 = .266$, where the older group of UT speakers were estimated to be older than the NZ speakers. Post hoc tests revealed that there were significant ($p < .001$) differences between the age estimates of young and middle-aged speakers, young and old-aged speakers, and middle and old-aged speakers. As expected, the young group of speakers were rated as younger, the middle group were rated as middle-aged, and the older group of speakers were rated as older. The descriptive statistics for perceived age are presented in Table 1. Figure 1 shows the same data in graphical form. A 10-year age range was known for each NZ speaker, rather than knowing the exact age of each subject. Because of this, age estimation accuracy could not be established. However, both gender and dialect were considered when examining *SD* variation. The purpose of this was to determine whether female or male listeners could estimate age more consistently, as well as whether the UT listeners were more consistent in their ratings of UT speakers versus NZ speakers. The results revealed that the gender of the listener did not significantly affect the standard deviation of the estimated speaker age, $F(1,2) = 1.463, p = .234$. In other words, women and men were equivalent in their variability in estimating the age of the speakers. An ANOVA test was also used to determine whether the UT listeners were more consistent in their age estimations of UT speakers when compared to NZ speakers. Tests of between-subjects effects revealed speaker dialect to be

significant, $F(1,36) = 8.064, p = .007, \eta^2 = .183$, in that the variability in estimating the UT speakers' age was higher. Speaker age group was also significant, $F(2,36) = 23.771, p < .001, \eta^2 = .569$, because the estimates of the older speakers' age were more variable. Additionally, there was a speaker gender by speaker dialect interaction, $F(1,36) = 5.097, p = .030, \eta^2 = .124$. The estimates of the female UT speakers' age were more variable than for the other speaker groups.

Confidence

Tests of within-subjects effects revealed a main effect for listener gender, $F(1, 36) = 26.187, p < .001, \eta^2 = .421$. The female listeners rated the speakers overall as higher in confidence. A listener gender by speaker dialect interaction, $F(1, 36) = 5.147, p = .029, \eta^2 = .125$, derived from the finding that the higher female listener ratings of confidence were more pronounced for the NZ than for the UT speakers. Tests of between-subjects effects revealed a significant main effect of speaker dialect, $F(1, 36) = 9.343, p = .004, \eta^2 = .206$. The NZ speakers were consistently given higher confidence ratings than their UT counterparts. The descriptive statistics for perceived age in year are presented in Table 2. Figure 3 displays the same data in graphical form.

Credibility

A within-subject main effect was found for listener gender, $F(1, 36) = 129.521, p < .001, \eta^2 = .783$. Female listeners, when compared to male listeners, rated the speakers as higher in confidence across each dialect and age group. There was a marginally significant between-subjects main effect for speaker age group, $F(2, 36) = 3.266, p = .050, \eta^2 = .154$. Older speakers generally had higher ratings of credibility, although a significant interaction between speaker dialect and speaker age was found, $F(2, 36) = 4.040, p = .026, \eta^2 = .183$. The young and old groups of UT speakers were rated significantly higher when compared to the young NZ speakers.

Table 1

Descriptive Statistics for Estimated Speaker Age in Years

Dialect	Age Group	Female Listener				Male Listener			
		Female Speaker		Male Speaker		Female Speaker		Male Speaker	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
UT Speaker	Young	27.6	3.9	34.7	9.4	29.7	3.7	33.7	9.7
	Middle	44.4	4.2	42.2	2.9	46.8	3.7	40.9	2.8
	Old	56.7	3.2	63.2	6.9	55.7	5.3	63.7	6.5
NZ Speaker	Young	22.5	3.7	27.0	0.9	26.1	2.7	28.4	0.8
	Middle	40.7	3.4	37.8	6.2	42.4	4.0	39.1	5.5
	Old	42.1	5.6	47.7	4.9	41.7	3.0	46.9	5.7

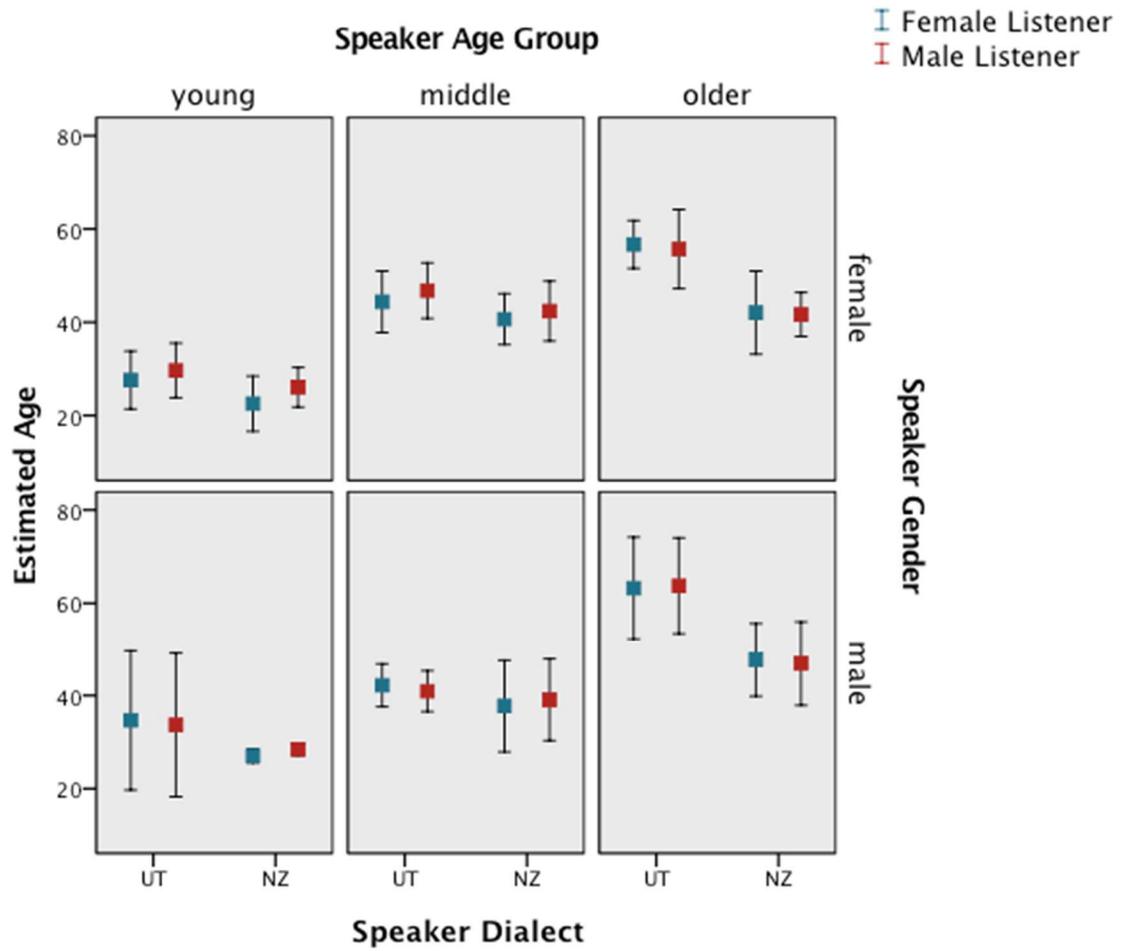


Figure 2. Mean and 95% confidence interval for estimated speaker age in years, showing differences by listener gender and speaker dialect, age group, and gender.

A post hoc test revealed that there was a significant ($p = .039$) difference between young and older speaker age groups in the credibility ratings received. The older speakers received higher ratings than the young speakers. The descriptive statistics for perceived age in year are presented in Table 3. Figure 4 shows the same data in graphical form.

Pleasantness

There was a within-subject main effect for listener gender, $F(1, 36) = 23.521, p < .001, \eta^2 = .395$. Female listeners tended to rate the speakers as more pleasant than the male listeners. A significant interaction was found between listener gender and speaker dialect, $F(1, 36) = 9.785, p = .003, \eta^2 = .214$. The male/female listener differences described above were more pronounced for the NZ speakers. A significant between-subject interaction of speaker dialect and speaker age group was found, $F(2, 36) = 3.483, p = .041, \eta^2 = .162$. This interaction derived from higher ratings of pleasantness for the NZ than UT speakers in the middle-aged group. Post hoc testing revealed no significant differences between age groups. The descriptive statistics for perceived age are presented in Table 4. Figure 5 displays the same data in graphical form.

Prestige

There was a main effect of listener gender on ratings of prestige, $F(1, 36) = 81.657, p < .001, \eta^2 = .694$. Female listeners consistently rated the speakers as higher in prestige than the male listeners. A significant interaction of listener gender and speaker gender was found, $F(1, 36) = 4.599, p = .039, \eta^2 = .113$, where the differences between male and female listener ratings of prestige were greater for the male speakers. Several between-subjects main effects were discovered. Speaker gender differences approached significance at the $p < .05$ level, $F(1, 36) = 3.665, p = .064, \eta^2 = .092$, where the male speakers were generally rated as slightly

Table 2

Descriptive Statistics for Confidence Ratings

Dialect	Age Group	Female Listener				Male Listener			
		Female Speaker		Male Speaker		Female Speaker		Male Speaker	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
UT Speaker	Young	60.2	18.0	56.0	17.3	55.8	11.4	53.6	13.7
	Middle	54.6	20.1	53.8	12.5	55.3	12.9	50.1	7.3
	Old	52.4	12.9	65.0	3.0	51.9	7.2	57.0	5.1
NZ Speaker	Young	63.5	7.0	71.2	4.5	58.1	6.7	61.4	11.4
	Middle	69.4	4.8	71.3	20.4	62.8	4.5	64.8	12.0
	Old	68.0	7.8	71.0	12.6	60.4	8.3	58.7	3.5

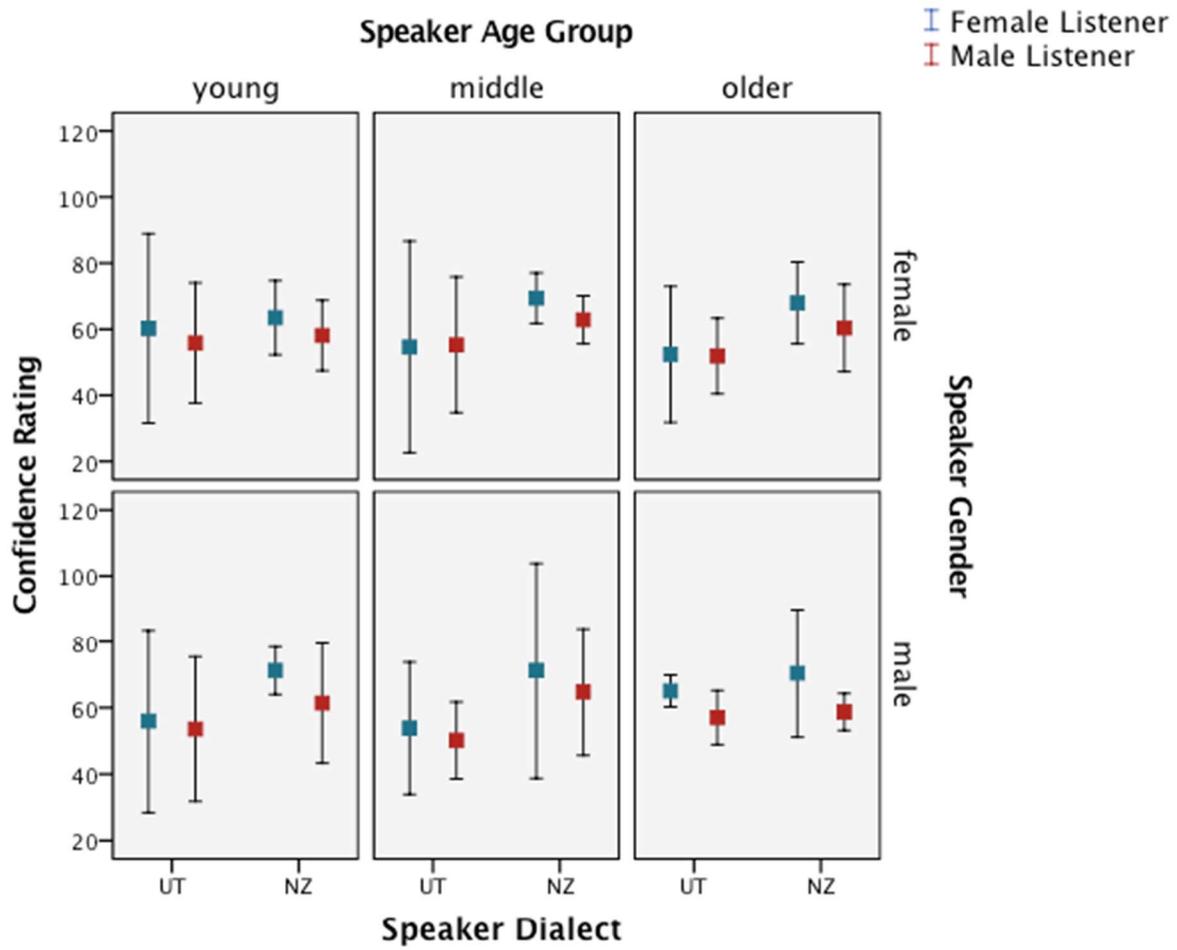


Figure 3. Mean and 95% confidence interval for confidence ratings, showing differences by listener gender and speaker dialect, age group, and gender.

Table 3

Descriptive Statistics for Credibility Ratings

Dialect	Age Group	Female Listener				Male Listener			
		Female Speaker		Male Speaker		Female Speaker		Male Speaker	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
UT Speaker	Young	73.2	7.3	72.5	9.3	66.0	8.3	61.9	5.5
	Middle	67.2	16.0	71.2	6.0	62.6	9.7	60.1	7.6
	Old	75.4	7.5	77.7	4.1	65.2	2.9	69.9	4.6
NZ Speaker	Young	64.8	3.8	63.9	4.1	57.6	6.7	54.8	1.8
	Middle	74.3	6.5	72.1	4.1	66.2	3.0	62.5	4.3
	Old	73.7	6.6	72.5	2.8	60.6	3.0	62.9	4.3

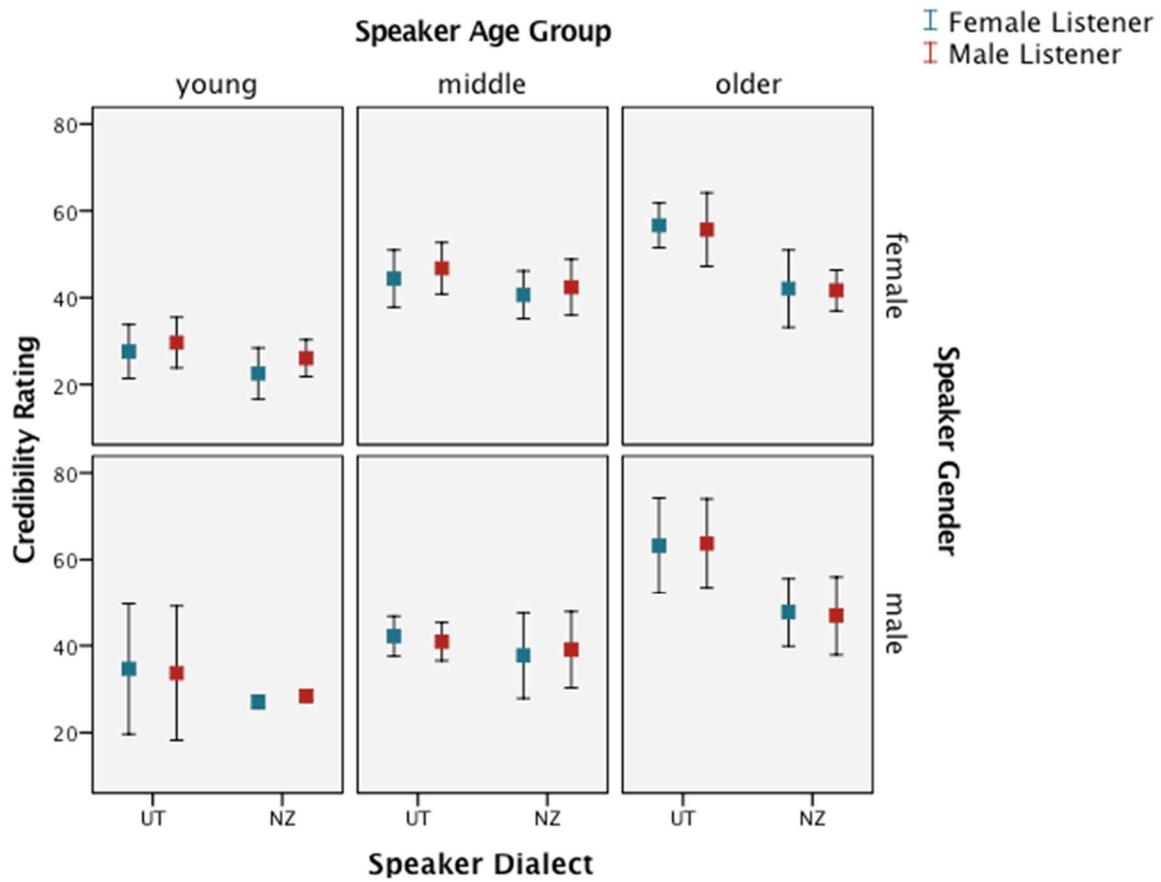


Figure 4. Mean and 95% confidence interval for credibility ratings, showing differences by listener gender and speaker dialect, age group, and gender.

Table 4

Descriptive Statistics for Pleasantness Ratings

Dialect	Age Group	Female Listener				Male Listener			
		Female Speaker		Male Speaker		Female Speaker		Male Speaker	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
UT Speaker	Young	68.1	7.8	61.8	10.8	64.9	8.9	59.9	4.1
	Middle	57.3	23.1	58.5	8.3	58.3	13.9	55.3	8.7
	Old	63.2	12.0	66.4	4.1	62.8	5.4	62.9	2.3
NZ Speaker	Young	63.1	3.4	64.6	8.2	58.3	6.4	54.5	4.0
	Middle	73.3	6.0	70.9	6.6	62.1	5.9	64.2	5.7
	Old	68.8	10.3	65.9	4.8	54.2	8.6	61.2	6.0

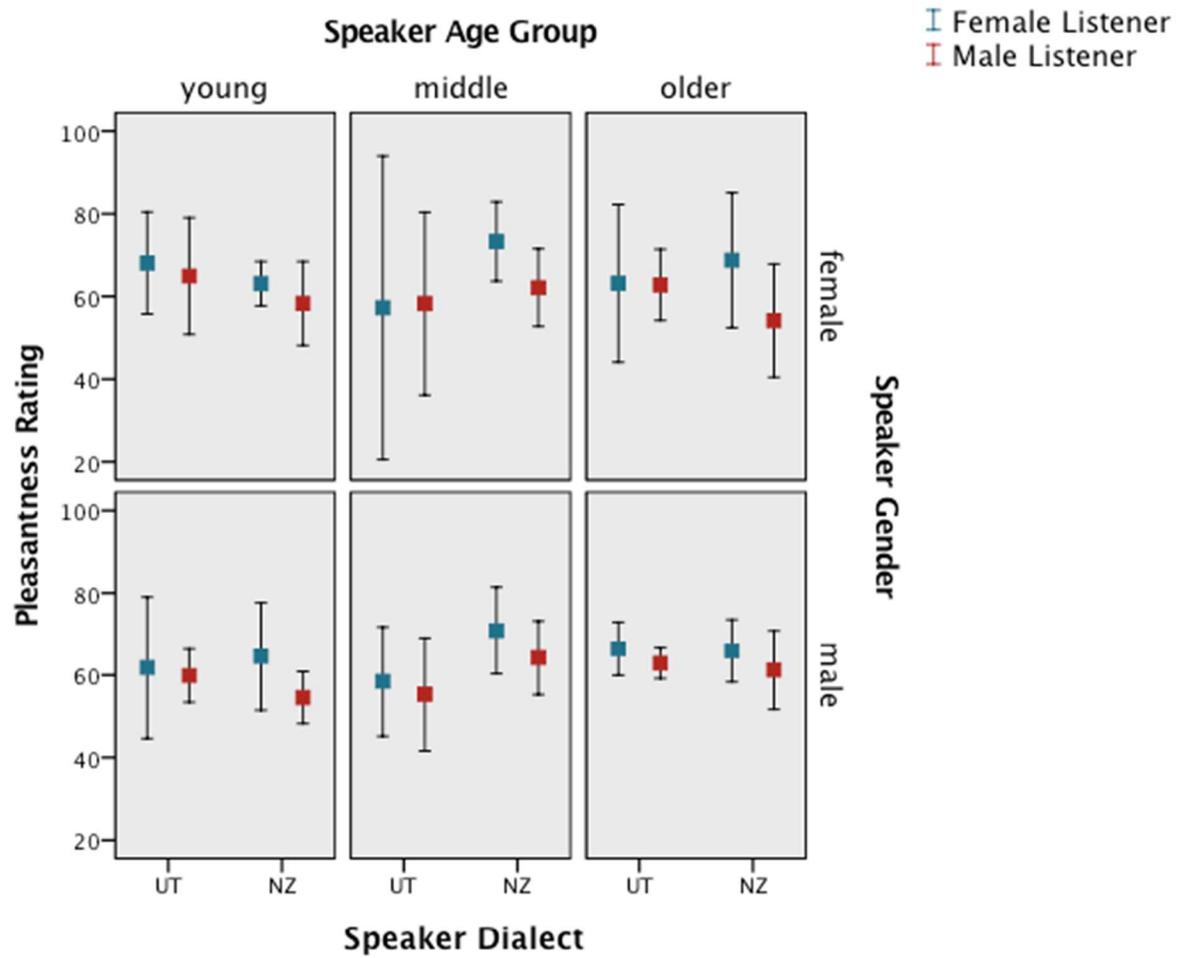


Figure 5. Mean and 95% confidence interval for pleasantness ratings, showing differences by listener gender and speaker dialect, age group, and gender.

Table 5

Descriptive Statistics for Prestige Ratings

Dialect	Age Group	Female Listener				Male Listener			
		Female Speaker		Male Speaker		Female Speaker		Male Speaker	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
UT Speaker	Young	52.2	9.2	52.8	8.7	47.8	7.0	46.3	7.2
	Middle	47.7	15.6	55.4	7.9	48.4	13.4	46.8	4.1
	Old	52.0	6.6	61.9	7.2	47.7	4.3	52.4	4.5
NZ Speaker	Young	47.5	6.1	54.9	3.1	42.2	2.9	50.1	7.2
	Middle	65.5	7.0	67.4	6.4	56.7	6.8	59.7	8.2
	Old	60.1	4.6	64.6	7.4	56.3	4.9	59.4	6.7

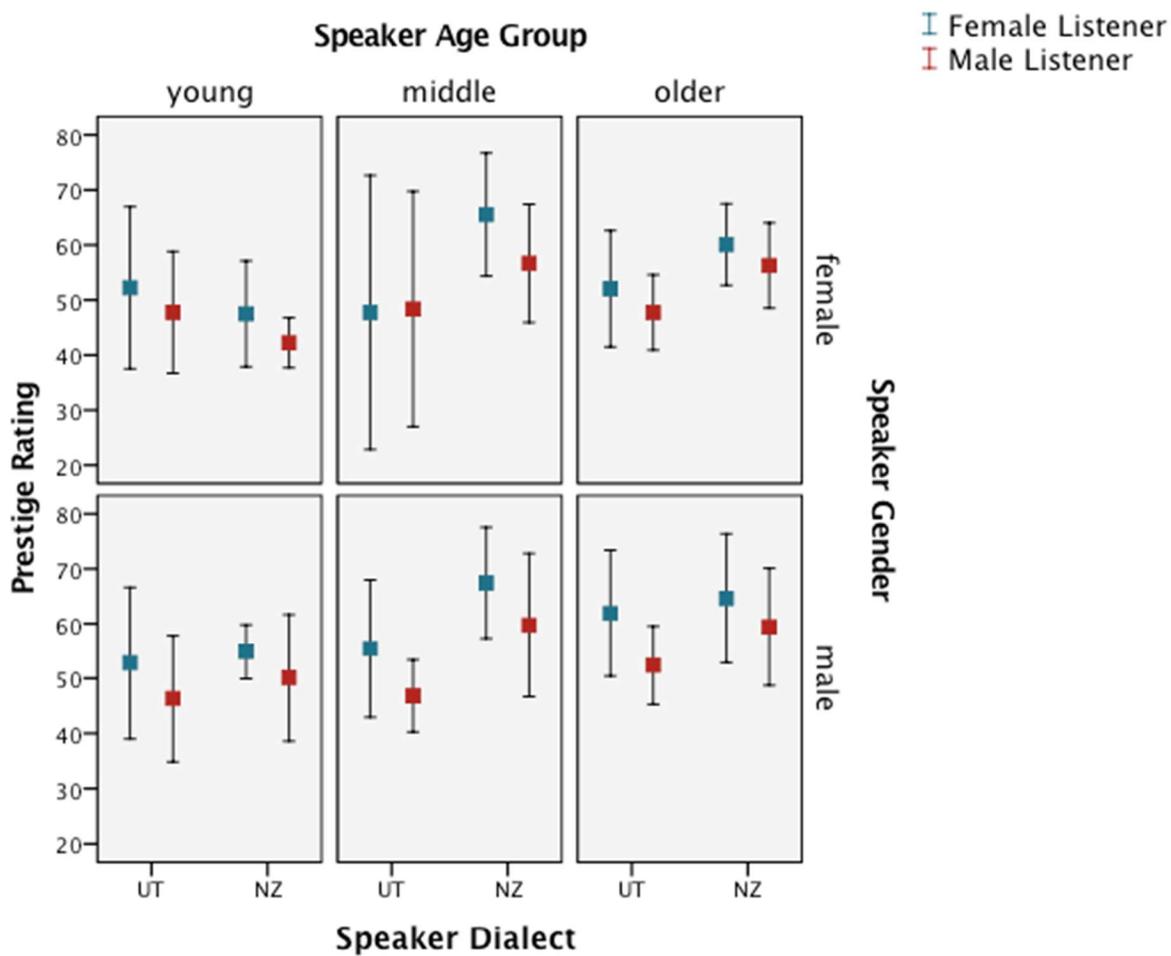


Figure 6. Mean and 95% confidence interval for prestige ratings, showing differences by listener gender and speaker dialect, age group, and gender.

higher in prestige than the female speakers. The effect of speaker dialect, $F(1, 36) = 8.582, p = .006, \eta^2 = .192$, showed that NZ speakers were rated as more prestigious than the UT speakers. The effect of speaker age group, $F(2, 36) = 5.333, p = .009, \eta^2 = .229$, revealed that middle- and older-age groups were rated as more prestigious than younger speakers. Additionally, a speaker dialect by speaker age group interaction was found, $F(2, 36) = 3.731, p = .034, \eta^2 = .172$. This interaction showed that NZ speakers in the middle and older age groups were rated as more prestigious. Post hoc testing revealed significant difference between the prestige ratings of young and middle aged speakers ($p = .031$) and young and older aged speakers ($p = .014$). The young age group of speakers received lower prestige ratings when compared to the middle and older age groups. The descriptive statistics for perceived age are presented in Table 5. Figure 6 shows the same data in graphical form.

Discussion

The purpose of this study was to examine the effects of speaker age, dialect, and gender on listener perceptions of the speaker's age and personality.

Effects of Listener Gender

When compared to male listeners, female listeners consistently gave higher ratings for each personality trait. However, the male listeners made higher age estimations than the female listeners. The results of the current study differed from those of Addington (1968), as well as Lukkarila, Laukkanen, and Palo (2012). Their research did not demonstrate significant differences in personality ratings for male and female listeners. In contrast, the present study's listener gender differences were among the most consistent findings. Irrespective of the age, dialect, and gender of the speaker, women tended to be more favorable in their perceptions of

speakers when compared to men.

Effects of Speaker Dialect

Research throughout the years has shown that listeners generally give nonnative speakers less positive ratings than they give native speakers. Anisfeld, Bogo, and Lambert (1962) found that native listeners did not rate a speaker with an accent different from their own more positively on any traits. Another study revealed that American listeners rated American speakers higher on solidarity traits when compared to RP speakers (Stewart, Ryan, & Giles, 1985). More recently, Eisenchlas and Tsurutani (2011) found that speakers with heavy nonnative accents each received generally negative ratings when compared to native speakers. Similarly, another recent study (Fuertes et al., 2012) found that when a listener perceived a foreign or minority accent, they were more likely to rate them lower in status, solidarity, and dynamism. In general, standard-accent speakers were rated more positively than speakers with nonstandard accents. The researchers also found that standard-accented speakers were consistently rated higher in the categories of solidarity, status, and dynamism, when compared to nonstandard-accented speakers.

Speaker dialect had a significant influence on listener perception. Contrary to these previous studies, the group of UT listeners rated the speakers using a foreign dialect higher on confidence, prestige, and pleasantness when compared to speakers using a native dialect. Additionally, the present study found that female listeners rated NZ speakers as more confident than the UT speakers. These findings demonstrate that listeners do not absolutely attribute negative characteristics to an individual with a foreign accent. This trend was also found for ratings of pleasantness. NZ speakers were rated higher than the UT counterparts on pleasantness

by female listeners. More specifically, higher ratings of pleasantness were given for the NZ middle-aged group. A main effect was also found between subjects in relation to speaker dialect on prestige ratings. The NZ speakers were rated as more prestigious than their UT counterparts.

Bayard et al. (2001) found that New Zealanders gave lower ratings to their own accent in comparison to the American accent. American listeners consistently gave the highest personality ratings to the American accent as well. In 2005, Bayard and Green found that the North American (NAmerican) accent was held in the highest regard by each of the listener regions represented. They suggested that the NAmerican accent appeared to be burgeoning as the prominent accent associated with prestige, status, competence, and solidarity. This stands in contrast to the findings of the current study, in which the NZ speakers were perceived as more prestigious, even though the listeners were all SAE speakers. The findings of the current study are consistent with those of Watanabe (2008), who found that both female and male listeners rated the NZE accent significantly higher on the traits of solidarity, competence, and status. It should be noted that the listener group in Watanabe's study consisted of residents of NZ. It is possible that native dialect bias impacted their findings. Previous studies such as Watanabe (2008) and Fuertes et al. (2012) have revealed that prestige and status have been associated with different accents over the years. Trends continue to change regarding which accents are held in higher regards. Today, media options involving a wide array of nationalities are highly accessible, and the higher exposure rates available to individuals may be playing a role in accent perception. Perhaps the increased exposure has increased both the positive and negative experiences an individual can have with different accents. Therefore, personality traits may not be consistently associated with certain accents. An additional explanation may stem from the fact that Americans may not have had

significant negative experiences with New Zealanders. Because they have not been a prominent immigrant population in the United States, they may not have been the recipient of potentially negative stereotypes.

Effects of Speaker Age

The current findings suggest that speaker age group could possibly influence the perception of personality traits. Giles, Henwood, Coupland, Harriman, and Coupland (1992) found that the perception of personality traits was influenced by a speaker's age. They found that older speakers were perceived as being more benevolent when compared to younger speakers. Additionally, an age by accent interaction revealed that older RP speakers were consistently rated more competent than younger RP speakers. Similarly, Lucas and Donnellan (2009) found that the traits of agreeableness and conscientiousness were positively associated with age. Their research revealed large effect sizes between the young and old age groups. In the current study, the older group of speakers were rated as more credible when compared to the young and middle-age groups. Similarly, ratings of prestige were higher for the middle and older age groups of speakers. The young and old age groups of UT speakers were rated higher in credibility than their NZ counterparts. For prestige ratings, the NZ speakers grouped in the middle and older-age groups were rated higher than their UT equivalents.

Regarding speaker dialect, the UT speakers were consistently perceived as being older than the NZ speakers. The main effect of speaker age group showed that younger speakers were perceived as younger. However, not knowing the actual ages of the NZ speakers may have contributed to this main effect. For each UT speaker, the exact age was known. In contrast, only an age range was given for each of the NZ speakers. Therefore, it is impossible to determine how

much significance this finding has because the UT speakers could have been older than the NZ speakers. Without knowing the exact ages of all speakers in the study, it is difficult to draw definitive conclusions.

In sum, these findings demonstrate that the speaker's perceived age influences listener perceptions. On a day-to-day basis, it is not so important if the listener can accurately identify a speaker's age. More importantly, it is the listener's perception of their age that carries weight because it is upon this that an individual makes their judgments.

Effects of Speaker Gender

For the trait of prestige, male speakers received significantly higher ratings than the female speakers. Although this was the only personality trait to differ between male and female speakers, it does reveal that speaker gender has the potential to influence perceptions. Another researcher (Addington, 1968) reported similar results. He found that even when a male and a female used similar speech characteristics (e.g., breathiness, nasality, rate) while reading the Rainbow Passage (a standardized passage), they received different ratings. Since prestige was the only personality trait in the present study where listeners rated male and female speakers differently, speaker gender does not appear to consistently influence the perception of personality traits. However, in a 2014 study (McAlear et al.), speaker gender was shown to influence the listener's perception of attractiveness. Their results revealed that speaker gender resulted in different personality traits being correlated with attractiveness. For example, male voices that were perceived as more attractive also had high ratings of dominance. In contrast, the female voices perceived as more attractive were correlated with higher trust and likeability ratings.

Limitations of the Present Study and Directions for Future Research

The lack of specificity regarding the age of the NZ speakers made it impossible to determine how accurately the listeners estimated speaker age. Thus, it was not possible to determine whether the UT listeners could more accurately identify the age of the UT speakers. Future research projects that include more specific demographic data could investigate the influence of dialect familiarity on the accuracy of age estimation. Because the speakers did not use the same words in their speech samples, word choice had a greater possibility of influencing the listener. However, the use of natural speech reflected authentic listening situations. Listeners do not typically have the opportunity to hear the same passage read by each speaker. Nevertheless, the connotations associated with a speaker's choice of words could influence a listener's perception of the personality of the speaker. Areas for future research might include continuing with spontaneous speech samples, but more closely controlling the topic and emotional tone of the speech in order to reduce the influence of these factors. Because the current study included only two accents, any general inferences concerning personality perceptions associated with different dialects should be made with caution. Finally, the listeners were a fairly homogenous group of Utahns, which is not necessarily representative of the larger population of American English speakers.

Despite these limitations, the current study revealed that dialect, age group, and both speaker and listener gender can influence a listener's perceptions of a speaker's personality, even on the basis of a short speech sample. Speaker perceptions were consistently influenced by listener gender. The findings of the current study help expand our awareness of the influence of speaker and listener characteristics on the perception of personality.

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APPENDIX A: Annotated Bibliography

Addington, D. W. (1968). The relationship of selected vocal characteristics to personality perception. *Speech Monographs*, 35(4), 492-503. doi:10.1080/03637756809375599

Objective: The aims of this study included examining the differences in personality perception between genders, examining stereotypes elicited by speech samples, and examining which vocal dimensions contribute to a listener's perception of the speaker.

Method: The Rainbow Passage was read by two female and two male speakers. One hundred and forty-four tape-recorded samples were recorded by the speakers, who were trained to simulate seven voice qualities (breathy, tense, thin, flat, throaty, nasal, orotund), three variants of speaking rate (normal, fast, slow) and three pitch varieties (normal, higher, lower). Three groups of trained listeners judged the vocal characteristics on a 7-point, equal-appearing scale. Each of the three groups was assigned one of the vocal characteristic groups (i.e., quality, speaking rate, or pitch) to rate. The perceived personality data set was collected from a group of student subjects at the University of Iowa. Four subgroups of 18 individuals rated the vocal characteristics of the sample while 16 subgroups of 20 raters rated the perceived personality characteristics. They listened to the samples and described the personality of the speakers using a 7-point adjectival scale (i.e., semantic differential scale).

Results: The mean average reliability for all 40 characteristics was .81, demonstrating that personality ascriptions are often shared by many listeners instead of being unique to an individual. The gender of the listener did not have a significant impact on the perception of individual personality traits. The personality traits exhibiting the highest and purest loadings for male speakers included hearty-glum, lanky-dumpy, potent-impotent, and soft-hearted-hard-hearted. For females, the traits included gregarious-antisocial, aggressive-unresisting, urbane-coarse, hardy-fragile, and appealing-disagreeable. Increased breathiness in the male speaker caused the listener to perceive them as younger and more artistic. In contrast, female speakers were perceived as being more feminine, prettier, more petite, more effervescent, and more highly strung and shallower. A thin voice did not reveal any correlations for the male speaker, but the female speaker received correlated ratings of increased immaturity on social, physical, emotional and mental levels. Both male and female speakers using a flat voice were perceived as more masculine, sluggish, colder, and withdrawn. An increase in nasality increased the perception of several socially undesirable characteristics. Male speakers who increased their vocal tension were perceived as being older, more unyielding, and cantankerous. In contrast, females with increased vocal tension appeared younger, more emotional, feminine, high-strung, and less intelligent. Throatiness in the male speaker was perceived as being older, more realistic, mature, sophisticated, and well adjusted. Increased throatiness in female speakers were stereotyped as being less intelligent, more masculine, lazier, more boorish, ugly, sickly, careless, inartistic, naive, humble, neurotic, quiet, uninteresting, and apathetic. Males speaking with more orotundity (an increase in sonority) appeared more energetic, healthy, artistic, sophisticated, proud, interesting, and enthusiastic. Females received ratings of increased liveliness, gregariousness,

and aesthetic sensitivity, but were also perceived as prouder and humorless. When both male and female speakers increase their rate, they were perceived as more animated and extroverted. An increase in pitch by a male speaker made him appear more dynamic, feminine, and aesthetically inclined. Females using an increase in pitch were viewed as more dynamic and extroverted.

Conclusion: Several personality traits were significantly correlated with vocal characteristics. The gender of the speaker had an impact on the stereotypes made about them based on their vocal characteristics. A male and female using the same vocal quality received different ratings.

Relevance to the current work: An association exists between vocal characteristics and how they interact with gender of a speaker. Listeners consistently make similar judgments about a speaker's personality based on vocal characteristics.

Anisfeld, M., Bogo, N., & Lambert, W. E. (1962). Evaluational reactions to accented English speech. *The Journal of Abnormal and Social Psychology, 65*(4), 223-231.
doi:10.1037/h0045060

Objective: The purpose of this study was to take the findings of Lambert, Hodgson, Gardner, and Fillenbaum (1960) and extend them to other cultural groups. Particularly, the researchers investigated the stereotypes associated with speakers using a Jewish accent.

Method: Several speakers read a philosophical passage once in English (E) and again in English, but using a Jewish accent (EJ). This was then evaluated by judges who selected the four subjects who best represented each accent. The eight guises and two practice voices using non-accented English comprised the speech sample the judges would hear. The listeners were a mixed group of Jewish and non-Jewish undergraduate students enrolled in psychology courses. The listener group was made up of 64 Jewish individuals and 114 subjects comprised the gentile group. Prior to the subjects listening, they were informed that objective measures of personality were available for the speakers and that they were being tested for their accuracy of evaluation against these standards. The subjects rated each guise on 14 traits using a 6-point scale (1=very little, 6=very much). Additionally, each subject indicated what emotional reactions were instigated by each voice by using a forced choice method (i.e., four positive and four negative emotional reactions were included in the options). They also rated their own voice on the same 14 traits. After this portion of the experiment was completed, they used a 6-point scale (-3= complete disagreement, +3= complete agreement) on the following scales: F Scale (scale measuring an individual's authoritative qualities), Anomie Scale (scale measuring how an individual regards social and moral norms), and an Anti-Semitism scale.

Results: Both the Jewish and gentile subjects evaluated the E guises more favorably than the EJ on height, good looks, and leadership. The Jewish subjects rated the EJ guises more favorably on sense of humor, entertainingness, and kindness. The gentile listeners did not perceive the EJ guises more favorably on any trait. The two listening groups did not differ on their mean scores on the F scale, the Anomie scale, or the Anti-Semitism scale. The Jewish subjects were more accurate at identifying Jewish voices than the gentile groups were. When compared to the gentile subjects, the Jewish subjects rated their own voices more favorably on all clusters (i.e., general

evaluation of self, dependability of self, and affability of self) and individual traits, except for religiousness.

Conclusion: Listeners perceiving an unfamiliar accent (Jewish or non-Jewish) were likely to rate the speakers as being shorter, less good looking, and lacking in leadership qualities. The Jewish listeners could identify the Jewish accent more accurately, demonstrating that familiarity with a particular accent leads to more correct identification. The Jewish listeners also rated their own speech more favorably, suggesting that they have more positive self-images.

Relevance to the current work: Stereotypes perceived by the listener are associated with speaker accent.

Bayard, D., & Green, J. A. (2005b). Evaluating English accents worldwide. *Te Reo*, 48, 21-28.

Objective: The purpose of this study was to examine how various English accents were perceived cross-culturally on an international level.

Method: Male and female pairs of speakers from Australia, New Zealand, the United States, and the United Kingdom provided the voices for the study. The eight speakers' ages ranged from 30-60 and they each read the same passage. In addition to the eight voices, a ninth voice was added as a practice or filler voice. A total of roughly 1700 subjects participated in the study and the experiment was conducted in a variety of countries across the globe (i.e., English-speaking countries, Europe, Asia, Fiji, and South America). Each listener heard the nine voices twice in the same order. After the first listen, they rated the voices using a 6-point Likert scale for 18 traits. On the second listen, the subjects identified their perceptions of the speaker's age, ethnicity, education level, occupation group, salary bracket, and social class using a series of multiple choice questions. The researchers clustered the 18 traits into four overarching traits: power, status, competence, and solidarity. They were asked additional questions about their English-language television watching habits, English-speaking countries visited, and time spent in those countries.

Results: The outcomes demonstrated that the North American (NA) accent was held in the highest regard by each of the regions presented. For example, in English-speaking countries, the NA was the dominant accent on most the personality traits. In South America and Asia, the NA accents were rated positively across almost all traits. However, the European region presented with a trend of associating the male English English (EE) accent with higher scores in status, prestige, and power.

Conclusion: At the time of the study, the NA accent appeared to be burgeoning as the prominent accent associated with prestige, status, competence, and solidarity. The status of the Received Pronunciation (RP) accent (i.e., the standard English accent used in the United Kingdom) as the prestigious accent also appeared to be waning.

Relevance to the current work: On a global level, regional accents appear to be associated with certain personality traits.

Bayard, D., Weatherall, A., Gallois, C. and Pittam, J. . (2001). Pax Americana? Accent attitudinal evaluations in New Zealand, Australia and America. *Journal of Sociolinguistics*, 5(1), 22-49. doi:10.1111/1467-9481.00136

Objective: The purpose of this study was to examine the prestige of the RP accent and to determine how native Australian and New Zealand speakers perceived their accent in comparison to the American accent. It also examined how Americans viewed their accent when compared to the RP-type EE accents.

Method: The listener group consisted of 257 New Zealand students (mean age of 22), 99 Australian students (mean age of 20), and 53 American students (mean age of 25). The gender ratio among all three samples was 2:1 (women: men). A 97-word passage was read by eight speakers. The speakers consisted of two New Zealand English (NZE) speakers, two Australian English (AusE) speakers, two NAm speakers and 2 South EE speakers. A male and female speaker were used for each accent type. The age range of the speakers was 30-46, except for a 60-year old used for the AusE male voice. Four tapes consisting of nine speakers (the previously mentioned eight speakers and a practice speaker) were played for each listener. After listening once, the participants rated their impressions of the person and their speech on semantic differential scales (22 traits in total). After listening a second time, the participants attempted to identify the speakers' age and ethnicity (choosing from a list of 12 possible ethnicities).

Results: New Zealand listeners could correctly identify their own accent and the EE accents. Australian participants accurately identified both the New Zealand and Australian accents. The American listeners were the only participants able to accurately identify the American accent. The American listeners rated the EE voice as lower than the NZE and NAm accents in status. Australian listeners rated their own accent higher in the areas of status, power and competence. The NZE male was rated most unfavorably by the New Zealand participants. Additionally, the EE female speaker was consistently rated lower in all traits when compared to the EE male speaker.

Conclusion: The American listeners consistently rated the NAm accent higher on most traits. Their ratings were stronger and more positive when compared to the other groups' ratings of their own voices. New Zealanders consistently gave their own accent a lower rating, but Australians did not.

Relevance to the current work: Based on speech alone, the accent background of both the listener and the speaker significantly impacts the perceptions of an individual's personality traits.

Brown, B. L., Strong, W. J., & Rencher, A. C. (1973). Perceptions of personality from speech: Effects of manipulations of acoustical parameters. *The Journal of the Acoustical Society of America*, 54(1), 29-35. doi:10.1121/1.1913571

Objective: The purpose of this study was to observe the effects of changes in fundamental frequency and speech rate on the perception of the speaker's personality.

Method: Four studies were conducted. The first study evaluated the realism of synthesized and rate-changed voices. Eighty-two male voices were included and composed of the following: 30 synthesized voices, 16 rate-changed voices, 24 normal voices, and 12 "unnatural" voices (e.g., four of the unnatural voices were laryngectomees) used for comparison. Each passage that was recorded was three sentences long, and a variety of passages were used. The voices were judged in three ways: rating scale, binary judgements, and categorization of voices. Seventeen college-aged male and female listeners used a 100mm rating scale with "realistic" on the extreme left and "unrealistic" on the extreme right. The listeners were instructed to place a single tick mark on the line to designate their perception. An average of the ratings was calculated. Regarding the binary judgement, 38 college-aged male and female listeners judged the voices as either "natural" or "synthetic". For the categorization judgement, judges listened to each voice and then selected from one of 11 voice categories for the voice to be placed. Before they made their judgments, they were informed about the proportion of synthesized voices included in the speech samples. Examples of the voice categories included computer generated pitch increase, rate increase, and normal. The second study examined the manipulation of variance of the fundamental frequency. Eight male students were recorded while reciting the same four-sentence passage. Each voice was manipulated in the following ways: unmanipulated control, F0 variance increase by 50%, and F0 variance decrease by 50%. Only the first two sentences from the passage were synthesized. The eight voices were interspersed between a variety of other voices and played to 50 college-age male and female listeners. They used a 22 paired-opposite adjective 7-point scale to judge the voices. The averages of the ratings were factor analyzed and the two resulting factors were labeled benevolence and competence. Study three examined the manipulations of rate. Thirteen adult male voices were recorded as they recited the same four sentences used in study two. Four of the voices were increased in rate by 56-57% and four were decreased in rate by 50-55% using the rate-changing mechanism. The 13 voices were interspersed among other manipulated and unmanipulated voices and played for 30 college-aged male and female judges. Listeners used the same adjective paired scale to judge the voices. For the fourth and final study, rate manipulation was examined, but a comparison was made between five different levels of rate manipulation. Four of the voices used for study three were used. The five rate manipulations made included: normal, 45-48% increase, 25-27% increase, 22-24% decrease, and 41-43% decrease. The voices were randomly ordered and 30 college-aged female judges rated the voices using the same 22 paired adjective scale.

Results: For study one, rate-changed voices were more easily mistaken for normal voices than synthesized voices were. More computer-synthesized voices were judged to be natural than were judged to be synthesized. Study two revealed that an increase in F0 caused the listener to perceive the speaker as more benevolent. Similarly, an increase in the variance of F0 caused the speaker to sound more competent. However, the latter finding was not statistically significant. In study three, slowing the voices had no effect on benevolence ratings, but significantly decreased competence ratings. Speeding the voices increased benevolence perceptions. However, speeding the voices did not increase competence. Similar to the findings of study three, study four

revealed that a decrease in rate caused the listener to rate the speaker as less competent, while an increase in speech rate increased the perception of benevolence.

Conclusion: Results from the four studies found more consistency for rate manipulation when compared to intonation manipulation. In general, an increase in F0 variance increased benevolence perceptions by the listeners. Conversely, a decrease in F0 variance decreased the perception of benevolence by the listeners. A slower voice was rated as less competent, while a voice that had been sped up was rated as less benevolent.

Relevance to the current work: Altering rate and fundamental frequency can influence personality perception.

Bruckert, L., Liénard, J.-S., Lacroix, A., Kreutzer, M., & Leboucher, G. (2006). Women use voice parameters to assess men's characteristics. *Proceedings of the Royal Society B: Biological Sciences*, 273(1582), 83–89. doi: 10.1098/rspb.2005.3265

Objective: The purpose of this study was to match vocal parameters to physical characteristics of the speaker. In addition, the ability of a listener to assess voice pleasantness and other characteristics of a speaker was examined.

Method: Twenty-six male French native speakers' voices were recorded. No regional accents were present and their ages ranged from 18-32 years. Each speaker was recorded while producing a series of five consecutive vowels (i.e., a, e, i, o, u) while maintaining a constant rate. The speakers used a natural voice. In addition to several physical measurements being made (e.g., height, weight, chest circumference), samples of each participant's saliva were taken to measure levels of testosterone. The listener group was composed of 102 female students, all of whom were native French speakers. The speakers were divided into five groups, with the 26th participant being included as a "control voice" for each of the groups. This control voice was the first recording heard by the listeners. The listeners were also divided into five groups and were assigned one of the five male speaker voices to listen to. After each female listener heard a recording of the five consecutive vowels, they rated the speaker on pleasantness, height, weight, and age. Pleasantness was rated on a 0-10 scale (0=not pleasant, 10=very pleasant). The following acoustical measurements were made on each male voice: mean fundamental frequency, overall temporal variation of fundamental frequency, speed of utterance, overall formant dispersion, and peak frequencies of the first five formants of each recording.

Results: Pleasantness ratings were most influenced by intonation. Voices with an increasing pitch were preferred over a decreasing pitch. Overall, the female participants were consistent in their pleasantness, height, weight, and age estimates. The estimated age and weight were correlated with the actual age and weight of the speakers. Formant frequencies and dispersion correlated with the actual age, as well as the estimated age. They were consistent in their age estimations of the male speakers. The taller male participants had low-frequency formants and little formant dispersion. The women were not able to correctly estimate height based on vocal intonation. However, they could estimate weight fairly accurately.

Conclusion: In general, formant components of the human voice transfer information about the speaker's physical characteristics in a consistent manner. Consistent weight and age estimations of the male speakers were made by the female listeners. Perceptions of pleasantness were consistent between the female listeners and an increasing pitch reflected an increase in the perception of pleasantness. The listeners were unable to identify height correctly based on vocal samples alone.

Relevance to the current work: Vocal characteristics (i.e., variations in pitch) were reliably associated with perceptions in personality. Additionally, estimated age and weight of the speaker were reliably correlated with the actual age and weight of the speaker.

Clark, L., MacGougan, H., Hay, J., & Walsh, L. (2016). "Kia ora. This is my earthquake story". Multiple applications of a sociolinguistic corpus. *Ampersand*, 3, 13-20.
doi:10.1016/j.amper.2016.01.001

Relevance to the current work: The researchers collected a corpus of speech samples consisting of individual monologues. The speakers shared their experiences in the aftermath of the earthquakes in Christchurch, New Zealand in 2010-2011. They used these speech samples to conduct sociolinguistic and community engagement research. The current study used these same speech samples to conduct the listener experiment.

Eisenchlas, S. A., & Tsurutani, C. (2011). You sound attractive! Perceptions of accented English in a multi-lingual environment. *Australian Review of Applied Linguistics*, 34(2), 216-236.
doi:10.1075/ara1.34.2.05eis

Objective: The purpose of this study was to assess the impact of non-native accents on listener perceptions of a speaker. Non-native professors were assessed by language and linguistic students to evaluate what kind of impact the accent made on the students' perceptions. It also aimed to evaluate if student familiarity with a particular language influenced their perceptions.

Method: Forty-one native Australian English speaking students participated in this study. All participants were enrolled in an introductory linguistics class at Griffith University in Australia. Each student was also enrolled in an additional foreign language course (one of seven different languages). Participants listened to a passage twice read in English by each of six male academic speakers. The six accents used by the speakers included Australian English, Italian, Japanese, Argentinian Spanish, Farsi, and Korean. The passage was 69 words in length and contained phonemes often found difficult for non-native speakers to articulate. After the second presentation, the listeners were given 30 seconds to rate each speaker according to 12 traits. Each trait fell under one of three categories: competence, integrity, and attractiveness. A 7-point semantic scale was used to rate each characteristic. Additionally, each listener attempted to identify the speaker's occupation and native language. To control for extraneous variables, the six speakers were all male and aged from 45-50.

Results: Participants had difficulty identifying speaker accents. The Australian English speaker was generally rated the highest among all the speakers. The Spanish speaker was rated as high as the native speaker in the areas of competence and integrity. Speakers with heavy non-native accents (i.e., Italian, Japanese, and Korean) each received generally negative ratings. For both Japanese and Spanish, the listeners who were studying those respective languages and who could identify those languages from the samples rated them more favorably. In contrast, when a listener was unable to correctly identify the spoken language, that speaker received less favorable ratings.

Conclusion: Students studying foreign languages demonstrated a favorable attitude towards speakers with non-native accents. In general, the language they were studying did not have an immediate impact on their speaker ratings. Also, the strength of the accent did not appear to influence the participants' perceptions of the speakers. When the listener could not identify the language, the student was more likely to rate the speaker more negatively. When the accent was perceived as being weaker, lower attractiveness ratings were made by the listeners.

Relevance to the current work: When listeners were able to identify the speaker's accent, they were more likely to rate the accent more favorably. Native accents were more likely to be rated higher by the native speakers.

Fuertes, J. N., Gottdiener, W. H., Martin, H., Gilbert, T. C., & Giles, H. (2012). A meta-analysis of the effects of speakers' accents on interpersonal evaluations. *European Journal of Social Psychology, 42*(1), 120-133. doi:10.1002/ejsp.862

Objective: The aim of this meta-analysis was to compare the results of numerous articles to analyze the effect that speaker accent has on a listener's attitudes and perceptions of a speaker.

Method: The studies included in the meta-analysis were required to meet the following criteria: the study had to address accented English and there had to be enough statistical information to calculate an effect size. Twenty studies were included in the meta-analysis. The three dimensions used to classify all the interpersonal ratings of each study included status (e.g., intelligence, social class), solidarity (e.g., trustworthiness), and dynamism (e.g., level of activity, liveliness). Cohen's *d* was used to quantify the effect sizes. A standard-accent represented the accepted accent of the majority population, while they defined non-standard accent as any accent that is foreign or spoken by minorities.

Results: In general, standard-accent speakers were rated more positively than speakers with non-standard accents. The researchers also found that standard-accented speakers were consistently rated higher in the categories of solidarity, status, and dynamism, when compared to non-standard-accented speakers. Additionally, the American accent was rated higher than the RP accent, running contrary to the researcher's hypothesis.

Conclusion: The researchers found that when a listener perceives a foreign or minority accent, they were more likely to perceive them as lower in status, solidarity, and dynamism.

Relevance to the current work: Listeners generally rated speakers with non-standard accents more negatively than standard-accented speakers.

Giles, H. (1970). Evaluative reactions to accents. *Educational Review*, 22(3), 211-227.
doi:10.1080/0013191700220301

Objective: The purpose of this study was to evaluate accents based on the perception of personality as well as aesthetic, communicative, and status content.

Method: The listener group consisted of 177 subjects equally selected based on age, sex, social class and geographical location. The two age groups had means of 12 years and 17 years. Two separate tasks were performed. Before the experiment was conducted, the listeners were informed that the purpose was to investigate attitudes towards various foreign accents. The three dimensions rated by the listeners included: how pleasant/unpleasant they perceived an accent to sound (i.e., aesthetic), how comfortable/uncomfortable they would feel when interacting with the speaker (i.e., communicative), and how much prestige they associated with the speaker (i.e., status). The 7-point scale associated the value of one with “extremely pleasant” and the value of seven with “extremely unpleasant”. For task one, a male speaker produced the same passage using 13 different foreign and regional accents. The passage was a 73-word passage with a duration of 35 seconds. The speaker attempted to control for speech rate, vocal intensity, pitch and personality throughout each sample. The subjects rated each voice sample across three dimensions using a 7-point scale. They listened to the samples separately and then rated them across the three dimensions. For task two, three lists of 16 accent options were presented to each listener in random order. Under each accent appeared a 7-point scale with which they rated each accent using one of the three dimensions at a time.

Results: Generally, the subjects could use the vocal stimuli to accurately identify the accent. The older age group (i.e., 17-year-olds) were more reliable at identifying accents than the younger age group. Several differences in the perception of the accents between the two age groups signify that the age of the listener contributes to the biases present in accent perception. The factors of age, sex, social class, and regional membership had significant impacts on how the speakers were evaluated.

Conclusion: Each accent was generally perceived as possessing a specific prestige or status value based on vocal cues alone. Stereotypical impressions, therefore, are created due to what status becomes associated with the accent.

Relevance to the current work: The familiarity and stereotypes associated with accent perception were reliable, but were influenced by the age of the listener.

Giles, H., Henwood, K., Coupland, N., Harriman, J., & Coupland, J. (1992). Language attitudes and cognitive mediation. *Human Communication Research*, 18(4), 500-527.
doi:10.1002/cpp.700

Objective: The purpose of this study was to examine British listeners' social assessments of voices. The three independent variables were accent, speech rate, and age.

Method: The subject group consisted of 95 females and 91 males with a mean age of 20 years. The 186 total subjects were divided into 12 groups and each group heard one of the 12 versions of the audio recording. The 12 voice recordings were produced using a factorial design. The three factors included: three speech rates (i.e., fast, medium, slow), two accents (i.e., RP, Nonstandard), and two age groups (i.e., older, younger-sounding). A 320-word message was consistently used as the stimulus by a single male actor using the matched-guise technique. The message was delivered in a way to give the impression that it was a spontaneous account of a car accident just witnessed by the speaker. An informal assessment was undertaken to establish the capacity of the male speaker to produce natural versions of each type of speech. Several rating tasks were completed by each subject. The first task required them to respond to the voice by writing down anything they could recall from the content of the speech, as well as any feelings or reactions to the discussion. The second task used a 7-point Likert scale (i.e., 1=not at all, 7=definitely) for several traits falling into either a competence or solidarity category. The third task required the subject to answer 10 questions using a 7-point Likert scale (i.e., 1=definitely to blame, 7=not at all). For the fourth task, each subject rated the voice on speech rate, accent, and social class, and also guessed the speaker's age in years. The final task was conducted two days later. Twenty-four statements were presented and each subject indicated their degree of confidence that the statement was spoken by the speaker two days previously. A 6-point scale was used to accomplish this rating task (i.e., 1=absolutely certain the item was not present, 6=absolutely certain the item was present).

Results: Slow speakers were perceived as sounding older when compared to the medium and fast speakers. The older speakers were perceived as more benevolent. They were also perceived as more hesitant. Speakers using a standard accent were rated as less benevolent and more competent when compared to nonstandard speakers.

Conclusion: Speech rate, speaker age and accent each influenced the perception of the listeners. Both main effects and interactions were found during data analyses, indicating that a listener is impacted by these factors.

Relevance to the current work: A listener is significantly affected by a speaker's speech rate, age, and accent.

Heaton, H., & Nygaard, L. C. (2011). Charm or harm: Effect of passage content on listener attitudes toward American English accents. *Journal of Language and Social Psychology*, 30(2), 202-211. doi:10.1177/0261927X10397288

Objective: The purpose of this study was to examine how the content of a passage influenced attitudes toward American English accents.

Method: Two accents were chosen for the study: American Southern accent and SAE. The participants were a group of 64 undergraduate students at Emory University and were granted some incentive for their participation. A variety of regions were represented by the participant group, including: North, Northeast, South, Midwest, Southwest, and West. For the selection of passages, the following experiments were conducted. Two passages were chosen to be consistent with Southern stereotypes (i.e., hunting and cooking). Two additional passages were created to be inconsistent with Southern stereotypes (i.e., medical and investment). Each passage was between 220-230 words and composed of 14.5-15 sentences with similar reading difficulty levels. Twelve listeners used a sliding scale from one to five (1=not at all, 5=very) to rate how characteristic the passage topics were for the seven previously listed American regions. A separate group of 33 listeners rated the passages according to how formal, rural, and characteristic of leisure each activity presented in the passage was perceived to be, using the same 5-point scale. For the judgement of the recordings, the following experiment was conducted. Male and females (both Standard- and southern-accented) comprised the speaker group. Each speaker recorded each of the four passages. Pilot tests confirmed that the speakers' accents were associated with the intended regions. Another group of 12 participants read each passage and then answered questions to determine the reliability of passage comprehension. Between-passage reliability was found for comprehensibility. A scale of 22 adjectives was developed to evaluate a range of attitudes and judgments concerning the speaking style of each speaker. For the procedure, each participant was randomly assigned one of the four conditions (2x2 matrix of speaker and passage). Each listener heard two passages (one male and one female speaker from the same region reading a different passage with same regional content) via headphones. After each participant completed their listening, they were asked questions to ensure comprehension of the passages and then completed the attitudes assessment. Subsequently, each speaker was rated for the 22 adjectives using a 7-point scale.

Results: When the speakers, regardless of accent type, read the non-Southern content passages they were consistently rated as more intelligent, educated, important, richer, and as having better English. When compared to Southern-accented speakers and regardless of passage type, speakers using SAE were rated as more intelligent, more arrogant, smarter, better educated, and as having better English. In contrast, Southern-accented speakers were rated as more amusing, friendlier, politer, more sociable, more cheerful and nicer. Judgements of Southern-accented speakers did not vary according to a change in passage. However, when standard-accented speakers read the Southern passage, they were rated as more sociable, more likeable, and more cheerful. Similarly, when the passage had Southern content, the standard speaker was rated much higher in sociality. The non-Southern passages were rated as higher in status than the Southern passages. Similarly, standard speakers were rated as having higher status than the Southern speakers.

Conclusion: Both speaker accent as well as content influenced the perception of attributes made by the listener. In general, the non-standard dialect was judged as more social and the standard dialect was judged as having higher status. It was shown that in some cases, passage content overrode dialect perception. Passage content and accent type showed strong levels of interaction. Attitudes towards standard-accented speakers changed depending on passage content, but did not change for Southern-accented speakers.

Relevance to the current work: Content and dialect interact to inform a listener's attitudes towards the speaker.

Hunter, E. J., Ferguson, S. H., & Newman, C. A. (2016). Listener estimations of talker age: A meta-analysis of the literature. *Logopedics Phoniatics Vocology*, 41(3), 101-105. doi:10.3109/14015439.2015.1009160

Objective: The purpose of this study was to aggregate and review numerous articles related to age estimation of English speakers. Data were extracted from peer-reviewed articles and combined into a single data set. The aim was to analyze age estimation by using a larger number of speakers, in order to increase understanding of how vocal quality influences age perception.

Method: The PubMed database was used to amass reviewed articles on age perception. English-speaking talkers and listeners were requisites. Seven relevant articles were used for the meta-analysis. These were selected because they included direct age estimates and displayed a resulting table or scatter plot rather than solely using descriptive statistics. Once articles were deemed to have pertinent data for data extraction, they were analyzed both individually and collectively. For each data set, the perceived age was calculated, as well as the average difference between perceived and chronological age. The absolute difference between perceived and chronological age was also calculated. Between the seven datasets, 530 data points comparing perceived age to chronological age were consolidated for the review. Ages of the speakers ranged from 10-90 and both female and male speakers were used. Stimuli presented included: isolated vowels, spontaneous speech, sentences, and paragraphs. The majority of listeners across the articles were "young adults."

Results: The average chronological age of the talkers was 54.63 years while the average perceived age was 51.86. A common trend included age overestimation for young talkers and age underestimation for older talkers. The most accurate perception of age appeared for the talkers aged between 35 and 55 years (i.e., absolute difference of roughly six years). The least accurate estimates were for speakers between 85 and 90 years of age (i.e., absolute difference of roughly 11 years).

Conclusion: In summary, a meta-analysis revealed that listeners using a wide range of stimuli could accurately estimate the speakers' age. In general, listeners overestimated younger speakers' ages and underestimated older speakers' ages. At age 50, estimated and perceived age were equal for the average group of listeners.

Relevance to the current work: A strong association exists between a listener's perception of a speaker's age and their chronological age.

Ikeno, A., & Hansen, J. H. (2007). The effect of listener accent background on accent perception and comprehension. *EURASIP Journal on Audio, Speech, and Music Processing*, 2007(3), 1-8. doi:10.1155/2007/76030

Objective: Perceptual assessments were made to investigate how a listener's accent background affected accent perception and comprehensibility.

Method: Thirty-three listeners with an age range of 22-43 took part in the study. US native and nonnative English listeners comprised 22 of the listeners, while the remaining 11 listeners were nonnative. The nonnative listeners had the following language backgrounds: Chinese, Croatian, German, Japanese, Korean, Spanish, Thai, and Tigrinya. British listeners were also included. For task one, spontaneous speech samples were gathered from three UK accents: Belfast (Irish), Cambridge (British English), and Cardiff (Welsh). Twelve content word samples, 12 short phrase samples, and 12 long phrase or sentence samples were extracted from the spontaneous speech. These 36 stimuli constituted the audio samples presented to the listeners. Listeners were presented with the samples in random order. A 60-second audio file of each accent was presented and each listener was asked to select one of the three accent types. Additionally, they indicated their confidence in their rating by using a 5-point scale (1= not sure at all, 5= absolutely sure). The same three accents used in task one were used in task two. For the second task, the listeners heard each audio file once and did their best to transcribe the speech content.

Results: Task one results revealed that US listeners' classification accuracy was significantly lower than that of British listeners. Additionally, nonnative listeners demonstrated the lowest classification accuracy. The difference between the US and nonnative listeners' ability to perceive differences between the three accents was significant. The confidence ratings revealed that the listeners' perceptions were not random, but were based on their perception of the accent types. British listeners' confidence ratings were consistently higher. Listeners were consistently better at identifying the correct accent when presented with longer phrases when compared to single content words. Task two results revealed that transcription accuracy was influenced by listener accent background and speaker accent type. Nonnative listeners had more difficulty comprehending the speech when compared to the British and US listeners. The comprehensible speech did not reliably correlate with more accurate accent perception.

Conclusion: A listener's accent background impacted their ability to accurately identify speaker accents. Significant interactions were found for both accent perception and speech comprehension. It was also found that speech comprehension contributed to accent perception. Comprehension is less dependent on listener accent type when compared to the perception of speaker accent type. The effect of speaker accent type was also found to be statistically significant. As a general trend, being a nonnative speaker or listener of English reduces an individual's ability to accurately classify accents.

Relevance to the current work: A listener's accent and speaker accent affected the perception and comprehensibility of the speaker.

Lambert, W. E., Hodgson, R. C., Gardner, R. C., & Fillenbaum, S. (1960). Evaluational reactions to spoken languages. *The Journal of Abnormal and Social Psychology*, 60(1), 44-51.
doi:10.1037/h0044430

Objective: The purpose of the study was to determine the impact of a speaker's particular language on listeners. Listener impressions were based on the speaker's language (i.e., English or French), rather than the voice of the speakers or the topic.

Method: The stimuli consisted of 10 voices. Four male bilinguals read a 2.5-minute passage in both English and French, creating 8/10 of the voices. The remaining two voices were filler voices. The subjects were told that they would hear 10 voices reading the same passage, but alternating the spoken language. They were not told that they would be hearing some of the same voices twice. Fourteen traits were rated by each listener on a 6-point scale (i.e., very little to very much). The following traits were included: height, good looks, leadership, sense of humor, intelligence, religiousness, self-confidence, dependability, entertainingness, kindness, ambition, sociability, character, and general likability. Each of the 10 voices was played once for the listeners. They also indicated what occupation they thought each man would likely be associated with. Each listener also ranked the traits according to how desirable they found them. Additionally, each listener completed Forms 40 and 45 of the California F Scale to assess generalized prejudice and ethnocentrism. They also completed 14 incomplete sentences which were designed to elicit attitudes toward other language groups, as well as their own. Additionally, they indicated their preference for English or French Canadians in terms of who they would rather be engaged in a social relationship with (e.g., marital partners, neighbors, tenants, etc.). Each listener also reported their age, religious background, place of birth, and degree of bilingualism. Sixty-four students comprised the English-speaking listener group. The average age was 18.8 years and gender was equally represented. Sixty-six male students with an average age of 18.2 years comprised the French-speaking listener group.

Results: The English listeners evaluated the following traits more favorably for the English than the French voices: height, good looks, intelligence, dependability, kindness, ambition, and character. No significant differences were found in the evaluations of leadership, religiousness, self-confidence, entertainingness, sociability, and liability. The English speakers evaluated the English guise more favorably for desirable traits and the less desirable traits. The French speakers evaluated the following traits more favorably for the English than the French guises: height, good looks, leadership, intelligence, self-confidence, dependability, ambition, sociability, character, and likability. More favorable ratings were given to the French guises in regard to the traits of religiousness and kindness. When the English and French listeners' evaluations were compared, they found that the English listeners evaluated height and religiousness more favorably for the English than the French guises. The French listeners evaluated the English guises significantly more favorably on leadership, intelligence, and self-confidence. When compared to the English listeners, the French listeners evaluated the French guises more favorably for kindness. The English listeners evaluated the French guise more favorably than the French listeners for the following traits: good looks, leadership, sense of humor, intelligence, self-confidence, dependability, ambition, sociability, and character.

Conclusion: Both the English and French listeners showed more favorability towards English guises. The highest ranked (i.e., most desirable) traits selected by the French were the traits they

rated more favorably for the English guise. The French listeners' evaluations of the French guise were reliably less favorable than those of the English guise.

Relevance to the current work: Listeners have attitudes and reactions to spoken languages. Personality trait perception can be associated with the language being spoken.

Lucas, R. E., & Donnellan, M. B. (2009). Age differences in personality: Evidence from a nationally representative Australian sample. *Development Psychology, 45*(5), 1353-1363. doi: 10.1037/a0013914

Objective: The purpose of this study was to examine which personality traits were associated with different speaker age groups.

Method: The participants were drawn from a longitudinal study of Australian households. Households in this survey were selected from various census districts. Household members aged 15 and older were included in the longitudinal sample. The ages ranged from 15-84. Data from 12,618 individuals were included in this study. Each head of household participated in a face-to-face interview concerning demographics, household structure, and education and work history. Each household member also completed a 36-item paper-and-pencil questionnaire to measure the *Big Five* personality traits (i.e., extraversion, neuroticism, openness, agreeableness, and conscientiousness). Each participant was asked, "How well do the following words describe you?". They rated each trait using a 7-point scale (i.e., 1= does not describe me at all, 7= describes me very well).

Results: Higher ratings in extraversion, neuroticism, and openness were associated with younger individuals when compared to older. Average levels of agreeableness and conscientiousness were lower in younger individuals when compared to older. The difference between age groups was less significant for the trait of extroversion when compared to the other four traits. Women were consistently rated as more extraverted, more agreeable, and more conscientious when compared to men.

Conclusion: Extraversion, neuroticism, and openness were negatively associated with age. Agreeableness and conscientiousness were positively associated with age in cross-sectional analyses. Large effect sizes were found between the young and old age groups.

Relevance to the current study: Personality traits were associated with age groups when individuals rated themselves subjectively.

Lukkarila, P., Laukkanen, A. M., & Palo, P. (2012). Influence of the intentional voice quality on the impression of female speaker. *Logopedics Phoniatrics Vocology, 37*(4), 158-166. doi:10.3109/14015439.2012.687762

Objective: The purpose of this study was to examine the effect of different vocal qualities on listeners' perceptions of the speaker. The researchers also compared their results to previous studies conducted in other countries.

Method: Five female Finnish speakers read the same 251-word passage with eight different vocal qualities (e.g., nasal voice, forward placement) and at three speaking rates (i.e., slow, modal, fast). A scale using 18 opposite-paired traits (e.g., kind-cruel, masculine-feminine, energetic-lazy) was used by 50 Finnish-speaking listeners to rate their impressions. Fourteen of the paired traits were selected from similar previous studies by Addington (1968) and Aronovitch (1976). The samples were presented in random order with no two speakers being presented in consecutive order. The age, sex, background education, and history of hearing impairment were also reported by each listener.

Results: The results revealed that listeners perceived voice stereotypes based on the speaking manner applied during the reading (e.g., forward placement increased the listeners' perceptions of enthusiasm, emotionality, and friendliness). Also, both similarities and differences were found in this study when compared to previous studies that evaluated the effect of varied vocal qualities on listener perception. No significant differences were found between male and female listeners' perceptions.

Conclusion: Voice qualities were generally associated with specific personality traits. When compared to previously published studies, international consistency and cultural dependence were found to exist in relation to voice stereotypes.

Relevance to the current work: Listeners made stereotypical judgments based on vocal quality.

Mallory, E. B., & Miller, V. R. (1958). A possible basis for the association of voice characteristics and personality traits. *Communications Monographs*, 25(4), 255-260. doi:10.1080/03637755809375240

Objective: The purpose of this study was to develop a basic theory or guiding principle that might account for the association of the perception of personality traits with speech.

Method: Three hundred and seventy-two freshmen members of Wellesley College constituted the speaker group. They read aloud as the listeners rated their voices. The listeners identified voices that contained "defects", exceptionally high or low pitch or rate, both desirable or undesirable traits (e.g., hard, resonant), and if the voices were perceived as confident or self-conscious. The Bernreuter Personality Inventory was administered to the speakers to obtain the most objective personality ratings possible. Regarding this inventory, the dominance and introversion/submissive scores were converted into T-scores to facilitate statistical analysis.

Results: All the associations found between personality traits and voice characteristics were slight. There was a positive association between the perception of dominance and the voice characteristics of loudness, resonance, and lower pitch. In contrast, submissiveness/introversion had a slight negative association with loudness, resonance, and lower pitch. A slight positive association was found between submissiveness/introversion and rapid rate of speech.

Conclusion: Despite the correlation results being weak, the researchers were able to support their hypothesis that vocal characteristic were associated with personality traits.

Relevance to the current work: In social interactions, certain personality traits are perceived based on voice characteristics.

Markel, N. N., Phillis, J. A., Vargas, R., & Howard, K. (1972). Personality traits associated with voice types. *Journal of Psycholinguistic Research*, 1(3), 249-255.
doi:10.1007/BF01074441

Objective: The purpose of this study was to examine the usefulness of a Voice Quality Profile (VQP) for a sample of normal speaking adults. In previous studies, loudness, tempo, and pitch have been rated to comprise the VQP for each speaker. In this study, only loudness and tempo were investigated in associating personality traits with voice types.

Method: Twenty white male students at the University of Florida were randomly selected from an initial pool of 124. Speech samples were obtained by prompting each participant with the following question: “What do you think of the Zip Code system?” The speech samples were then randomly ordered and played for seven judges. The ratings for loudness and tempo were made using a 5-point sliding scale (i.e., 1=soft, 5=loud; 1=slow, 5=fast). Four categories were created for each voice to fall into: loud-fast, loud-slow, soft-fast, and soft-slow. Each judge was trained on how to rate the voice qualities accordingly. Sixteen personality traits were available for the judges to attribute to each voice using a binary scale.

Results: The voices categorized as loud-fast exhibited the following personality traits: bright, self-sufficient, and resourceful. Voices rated as loud-slow included the following: bright, aggressive, competitive, confident, self-secure, radical, self-sufficient, and resourceful. The soft-fast category was most strongly associated with the following personality traits: bright, enthusiastic, happy-go-lucky, adventuresome, thick-skinned, confident, self-secure, radical, phlegmatic, and composed. Lastly, voices determined to be soft-slow were associated with the following personality traits: bright, aggressive, competitive, enthusiastic, happy-go-lucky, adventurous, and thick-skinned.

Conclusion: There are specific and distinguishable personality traits that an unfamiliar listener associates with a speaker based on his or her voice quality. When speakers’ voices were grouped into one of four voice quality categories, patterns began to emerge that reinforced the notion that listeners perceive personality via voice characteristics.

Relevance to the current work: A listener bases part of their perception of an individual’s personality on vocal quality.

McAlear, P., Todorov, A., & Belin, P. (2014). How do you say ‘Hello’? Personality impressions from brief novel voices. *PLoS One*, 9(3), 1-9. doi:10.1371/journal.pone.0090779

Objective: The purpose of this study was to determine listeners’ perceptions based on the single word *Hello*. Perceptions were rated using a sliding scale. Ten traits were judged and ranged from likeable/warm to strong/dominant.

Method: Sixty-four Scottish speakers' voices were recorded for the study. Thirty-two were men and 32 were women. There were 320 listeners who rated the speech samples. All participants were given some form of credit or money for participating. Each speaker read an unfamiliar recording and the word *Hello* was extracted for the study. The listeners were each pseudo-randomly assigned one of the 10 traits to rate each speaker with (i.e., aggressiveness, attractiveness, competence, confidence, dominance, femininity, likeability, masculinity, trustworthiness and warmth). A 9-point Likert scale was used (e.g., 1= extremely unattractive, 9= extremely attractive) by the raters. The listeners heard and rated the recordings in their home environment. Eight acoustic measures were also computed to test for correlations between perceptions and physical measurements.

Results: For the female voices, as trustworthiness increased, perceived femininity increased. However, when male trustworthiness increased, masculinity ratings decreased. Male voices that were perceived as more attractive also had high ratings of dominance. In contrast, the female voices perceived as more attractive were correlated with higher social integrity ratings.

Conclusion: In general, listeners showed high reliability in their rating of personality based on a single word. This demonstrates that impressions are made upon the listener almost instantly. Likeability was related to perceived pitch variation. Perceptions of vocal attractiveness for women were most closely related to warmth and trustworthiness. For men, they were related more closely to strength.

Relevance to the current work: As opposed to other studies where lengthy and random dialogue was rated by listeners, a single introductory word was used. This revealed that perceptions are made instantly through vocal quality.

Purnell, T., Idsardi, W., & Baugh, J. (1999). Perceptual and phonetic experiments on American English dialect identification. *Journal of Language and Social Psychology*, 18(1), 10-30. doi:10.1177/0261927X99018001002

Objective: The purpose of this study was to determine if dialect discrimination is possible by using phonetic cues alone, which cues trigger discrimination, if dialect identification is possible using a single word, and if phonetic correlates of dialect can be associated with discrimination. Four experiments were conducted.

Method: For the first experiment, the speaker was one of the researchers, Baugh (who is African American), who is personally familiar with African American Vernacular English (AAVE), Chicano English (ChE) and SAE dialects. He called five prospective landlords in five distinct locales. Each landlord was telephoned on three separate occasions and randomly used each of the three dialects with no less than 30 minutes between each phone call. The following phrase was used at the beginning of each phone call placed: "Hello, I'm calling about the apartment you have advertised in the paper." The number of appointments arranged after each phone call was recorded. The purpose of experiment two was to determine whether dialect identification is possible at the macro-linguistic or sentence level. The speakers were a group of 20 individuals with a variety of racial and ethnic backgrounds. Each spoke one of the previously identified

dialects. Baugh also recorded himself using all three of the dialects. The token sentence used was the same used in experiment one. The listener group was composed of 421 students at Stanford (382 native English speakers and 39 nonnative English speakers). Each student listened to the recordings once and then again to make their judgments. Two traits were evaluated: gender and race/ethnicity (i.e., African American, Hispanic American, and European American). The students were thus forced to select from six possible responses. The purpose of experiment three was to examine if listeners could recognize dialects at the micro-linguistic, or phonetic, level. The single word *Hello* was used from the previously recorded sentences produced by Baugh. Fifty students at the university of Delaware comprised the listener group. Each listener was a Caucasian native speaker of SAE. The stimuli consisted of 60 tokens with an equal number of each dialect being used. The recording was played twice for each student and they indicated which dialect they believed they heard. For experiment four, the word *Hello* as used in the previous experiment, was acoustically analyzed for the following measures: segment, syllable, word durations, the ratio of these durations to the duration of the word, the amplitudes of the first two harmonics of each vowel, the ratio of the amplitudes, the harmonics to noise ratio (HNR), and the location in the word of the highest F0 peak. Thirty tokens (10 for each dialect) were compared on 28 variables.

Results: Experiment one revealed that the percentage of appointments made in each locale corresponded with the ethnic makeup of the geographic area. For example, the predominantly white neighborhoods exhibited the strongest bias against the non-standard dialects. When SAE was used, positive appointments were made irrespective of the population makeup of the geographic locales. In contrast, when AAVE or ChE were used by the speaker, the percentage of housing appointments made was proportional to the minority population who used those dialects. ChE and AAVE guises both had the lowest success rate in securing an appointment. Experiment two revealed that the students consistently identified Baugh's guises correctly and were able to match them to the appropriate dialect and gender. Guise identification was shown to be possible at the macro-linguistic level. The listeners in experiment three generally showed that they could identify the correct dialect based on hearing the single word *Hello*. They were able to identify the correct dialect more than 70% of the time. Guise identification was shown to be possible at the micro-linguistic level. Results for experiment four showed that dialect was distinguished based on four measurements: the frequency of the 2nd formant in /eh/, the pitch peak ratio, the duration of the first syllable, and HNR. However, these features did not reliably differentiate all three dialects.

Conclusion: Dialects can be differentiated and determined by listeners at both the macro- and micro-linguistic levels. Only a small sample of speech was required for dialects to be accurately identified. Acoustic phonetic measures can be used to discriminate between dialects. In general, because dialect can be identified by a listener, this often affects how the individual is treated based on local ethnic norms. A speaker's voice and dialect fostered discrimination on the basis of local ethnic demographics.

Relevance to the current work: Dialects can be identified by listeners and can influence their perceptions of the speaker.

Riches, P., & Foddy, M. (1989). Ethnic accent as a status cue. *Social Psychology Quarterly*, 52(3), 197-206. doi:10.2307/2786714

Objective: The purpose of this study was to examine how perceptions of ethnic accent translate into performance expectations and behavioral influence. A group task was used to facilitate this process to determine the emergence of power and prestige order as well as the acceptance and influence by group members. Speech quality was controlled while ethnic accent was the focus of the study.

Method: A pretest was conducted to develop control of speech quality, to see how naive listeners would rate the two accents, and to determine if the two types of speakers would be perceived as different. The listeners were 48 female university students with an average age of 21.57 years. Half of the listeners were Anglo-Australians and half were Greek-Australians. The two speakers were a native Anglo-Australian and a Greek-Australian. Each listener participated in a pattern recognition ability task that facilitated group interactions with a voice (the speaker was unseen to the listener). The listener was able to eavesdrop on the speaker as well as make a joint decision with the partner. At the end of the task, the listeners were interviewed by the researcher. They were asked questions concerning their partner's accent. They also rated the voice using an adjective scale that primarily focused on status dimensions (i.e., industrious, intelligent, educated, powerful, competent), solidarity dimensions (i.e., helpful, pleasant, dependable), and speech qualities (i.e., loud, fast, natural, high-pitched). A six-point scale was used to make their ratings. Four conditions arose during the experiment where the listener and speaker were ethnic-homogenous or ethnic-differentiated.

Results: Competence was the only personality trait that approached significance. The Anglo-Australian subjects consistently gave a lower competence rating to the Greek-Australian speaker. The Greek-Australians also rated the Anglo-Australians as more competent than themselves.

Conclusion: The two speakers' status dimension was evaluated differentially by the listeners based on judgments made due to ethnic accent. One accent was found to be rated higher in competency, despite the listeners having different accent backgrounds.

Relevance to the current work: Ethnic accent influenced a listener's perception of personality and competency in a task-oriented group setting.

Rosenberg, A. & Hirschberg, J. (2009). Charisma perception from speech and text. *Speech Communication*, 51(7), 640-655. doi:10.1016/j.specom.2008.11.001

Objective: The purpose of this study was to evaluate the levels of charisma in an individual's speech based on what they say and how they said it. The goal was to determine if charismatic speakers shared acoustic features. These were then analyzed to see if any associations existed between these characteristics and lexico-syntactic form. This information could in turn help to create synthetic charismatic speech used for political or economic purposes. Results could also aid in automatic identification of charismatic speakers. Additionally, online training systems could be created to assist individuals seeking to make their speech more charismatic.

Method: Recordings from nine Democratic presidential nominees were selected for the study. Various speaking formats were used to gather the speech and text from each politician. In general, charisma is an aim of most presidential candidates. Only Democrats were chosen in order to limit the variety of opinions expressed. Five speech topics were selected: health-care, postwar Iraq, President George Bush's tax plan, the candidate's reason for running, and a content-neutral topic (e.g., greetings). For each of the five topics, the genre was varied among the following types: interview, debate, stump speech, and campaign ad. Each speech sample ranged from 2-28s. Half of the samples were regarded as 'charismatic' and half 'non-charismatic' by the experimenters. The raters used a 5-point Likert scale to rate levels of charisma in the speech (1=disagree completely, 5=agree completely). Measures were taken to ensure that each listener agreed on the definition of a charismatic speech quality. Eight native English speakers evaluated the presidential nominees based on charisma.

Results: There were significant differences in the listeners' perceptions of charisma. However, within-subject agreement was established in that the participants were consistent with how they perceived charisma and rated it accordingly. Enthusiastic, charming, persuasive, and convincing were common characteristics perceived when the speaker was identified as charismatic. Speech samples that were deemed charismatic were likewise deemed as charismatic when received in text form. Recognized speakers were perceived as more charismatic than those who were unfamiliar to the listener. In relation to acoustic measures, increased loudness correlated with perceived charisma. With both increased F0 and speaking rate, the speaker was perceived as more charismatic.

Conclusion: Strong associations were identified between the perception of charisma in a speaker and acoustic measures. The strongest correlations were found for intensity, fundamental frequency, and speaking rate. Common acoustic features were identified when perceiving charisma in a speaker. Inter-judge agreement was weak; however, there was strong intra-judge reliability.

Relevance to the current work: Measurable vocal parameters positively correlate with personality perceptions, particularly charisma.

Smith, B. L., Brown, B. L., Strong, W. J., & Rencher, A. C. (1975). Effects of speech rate on personality perception. *Language and Speech*, 18(2), 145-152.
doi:10.1177/002383097501800203

Objective: The purpose of this study was to analyze how speech rate affected a listener's perceptions of the speaker. By increasing and decreasing speech rate, speaker personality traits were measured to examine the influence of speech rate on each listener.

Method: Six subjects' voices were chosen from a pool of 28 based on the results of a rating process using 15 paired-opposites (the same used by Brown et. al in 1973). The six voices selected were used to computer-generate 54 synthetic voices producing two sentences. Each of the 54 voices' rates were increased and decreased by 12.5%, 25%, 37.5% and 50%. The same

paired-opposite scale used to select the six original voices was again used by the listeners to evaluate the 54 synthetic voices. Two main adjectives, competence and benevolence, were used to evaluate each of the 54 voices. Twenty-eight judges evaluated the voice recordings.

Results: A decrease in speech rate caused the speakers to be perceived as less competent and an increase in speech rate caused the speakers to appear more competent. This latter finding differed from a previous study by Brown et. al in 1972. With regard to benevolence, increasing speaking rate did not increase this personality trait. In fact, any speech rate manipulation caused the listeners to perceive the speaker as less benevolent.

Conclusion: Speaking rate had an influence on how a speaker is perceived. This study was consistent with previous studies in that decreasing speaking rate made the speaker appear less competent. However, the most notable contribution of this study was that increasing speaking rate made the speaker appear more competent. The trait of benevolence, when compared to competence, was not as affected by the rate of speech.

Relevance to current work: Speaking rate can influence the listener's perceptions of benevolence and competence.

Stewart, M. A., Ryan, E. B., & Giles, H. (1985). Accent and social class effects on status and solidarity evaluations. *Personality and Social Psychology Bulletin*, 11(1), 98-105.
doi:10.1177/0146167285111009

Objective: The first objective was to determine if American listeners assign higher status to the RP accent when compared to their own. Secondly, the effect of social class information about the speakers on accent evaluation was examined. Lastly, the perception of attributes associated with a speaker's accent was examined.

Method: Sixty American university undergraduates participated as the listener group. Fifty-eight percent of the participant group were males and were aged between 18 and 22 years. The speaker group consisted of four male speakers reading a 98-word formal-style passage. Two of the speakers spoke English with the RP accent and two spoke with a standard American accent. Also included were four typed social class descriptions that provided information concerning the speaker's occupation, spouse's activities, and residence. Each participant listened to each of the four recordings and were given the accompanying written descriptions of each speaker. They rated each speaker using a Likert scale on social status, solidarity, perceived belief similarity, and social class traits. The recordings and descriptions were presented again and the participants rated the importance of four causes for each speakers' success or failure in four hypothetical situations. A third listening occurred wherein listeners rated perceived speech rate, difficulty with understanding, and discomfort while listening to the speaker.

Results: Speakers introduced as upper middle class were perceived as belonging to a significantly higher class than those who were described as lower class. RP speakers were perceived as having higher status than Americans, but they received lower solidarity ratings.

Solidarity ratings were higher for lower class speakers. British speech was perceived as significantly faster than American speech. However, the American speakers were perceived as more intelligible and more comfortably understood. Higher status was attributed to the British accent and the middle-class status.

Conclusion: The researchers' hypothesis was confirmed in that a higher status was associated with the RP accent. The ratings made concerning the speaker's success and failure were consistent with the trait ratings. Social class information about a speaker influenced the listener's perceptions.

Relevance to the current work: Personality traits were consistently associated with a listener's accent among a highly homogeneous listener group.

Sung, K. (2001). Elder respect exploration of ideals and forms in East Asia. *Journal of Aging Studies, 15*(1), 13-26. doi: 10.1016/S0890-4065(00)00014-1

Relevance to the current work: The purpose of this article was to examine attitudes of respect for the elderly in East Asian countries. This article informed the current study by highlighting how age groups are perceived in foreign countries. This information was then compared to the findings of the current study.

Warhurst, S., McCabe, P., & Madill, C. (2013). What makes a good voice for radio: Perceptions of radio employers and educators. *Journal of Voice, 27*(2), 217-224. doi:10.1016/j.jvoice.2012.08.010

Objective: The purpose of this study was to evaluate what radio employers and educators believed made a good voice for radio broadcasting. It also evaluated what they thought was important when employing radio broadcasters across various roles.

Method: The participant group consisted of nine participants (three educators and six employers). Each participant was interviewed for 30-40 minutes in a semi-structured format. The five questions asked to each participant sought their opinions on the following: what they look for in a voice when making employment decisions across three different occupations (i.e., announcer, newsreader, and voice-over artist), what type of training they perform for their voice employees, and what they think makes a good voice for radio.

Results: Content and personality were main factors. The employers wanted to feel that the individual speaking was confident and knowledgeable about their message on the air. They also preferred when the voice of the individual fit the demographics of the area where the broadcast was being made (i.e., gender and vernacular style should generally match the targeted audience). Having a voice that was "easy to listen to" was another important factor for the educators and employers. Being easy to listen to included the following factors: warmth, depth of pitch, clarity of speech, animation, no faults, and a distinctive voice. They also wanted the conversations with the listeners to sound real, natural, and relatable. The speech characteristic of depth of pitch was

often associated with viewing the speaker as stronger, more assured, and more confident. Mid-range voices were perceived as more relatable to the “everyday” person. A warm voice was associated with likeability and engagement. Clear diction left an impression of authority and accessibility for the listener.

Conclusion: The employers and educators who were interviewed cited several factors that contributed to the predicted success of vocal performers. The main factors considered by the participants included being easy to listen to and matching the demographic of the listeners with the broadcasting station. A high level of vocal skill and a dynamic ability to create positive impressions on listeners were the main findings.

Relevance to the current work: Vocal characteristics influence the perceptions of the listener.

Watanabe, Y. (2008). New Zealand attitudes towards foreign-accented English. *Te Reo*, 51, 99-127.

Objective: The purpose of this study was to investigate how New Zealand speakers evaluated or perceived non-indigenous English accents in terms of status, competence and solidarity. Additionally, the researchers aimed to learn if English as a second language (ESL) accents would receive less favorable ratings.

Method: Eighty residents of Christchurch, NZ with a median age of 21 and a male-female ratio of 21:59 participated as the listener subjects in the study. None of the subjects had previously taken any language attitude test. A 128-word passage was read by 15 speakers of various language backgrounds (e.g., Malay, German, Japanese, US English, New Zealand English, etc.). A total of 15 voices were played twice for each listener with an accompanying transcription of the passage. After the first playback, each listener rated the speaker using a 5-point Likert scale for nine variables (i.e., pleasantness of accent, friendliness, sense of humor, confidence, reliability, hard working, intelligence, education, and income). Each of the traits fell under one of three groupings: solidarity, competence, and status. In addition to rating these traits, the subjects also estimated the speaker’s age, and their occupation. They were given a list of five options, each of which included 1-3 occupations to select from. During the second playback, the listeners were asked to identify the speaker’s first language or regional accent by selecting one from a list.

Results: The listeners could perceive the correct age of females within three years on all speakers except one. The NZE accent was most often correctly identified for both the female and male readers. The male US English (USE) speakers were also consistently identified as American or North American. For women, the NZE accent was rated significantly higher than any other accent on nearly all traits of solidarity, competence, and status. The traits of friendliness and sense of humor were the exceptions, and it was not the USE accent that received the highest rating. The male speakers using a NZE accent also received the highest ratings from the subjects. Additionally, male speakers with ESL accents were not all given lower ratings, as shown by the French accent being rated very highly by the listeners.

Conclusion: In contrast to previous studies showing that the English accent was identified as more prestigious and favorable, the current study showed that the New Zealand accent consistently received the highest ratings in terms of solidarity, competence, and status.

Relevance to the current work: The accent background of listeners contributed to their perception of both native and nonnative accents.

Yamada, N., Hakoda, Y., Yuda, E., & Kusuhara, A. (2000). Verification of impression of voice in relation to occupational categories. *Psychological Reports, 86*(3 Pt 2), 1249-1263. doi:10.2466/pr0.2000.86.3c.1249

Objective: The purpose of this study was to determine how voice characteristics determined the perception of personality traits, physical characteristics, and occupational categories.

Method: In the first study, the participant group consisted of 62 women and 52 men. They were college students with an age range between 18 and 31. The speaker group consisted of 25 males saying, *Hello. Hello.* The voices were primarily selected based on the following characteristics: powerful, powerless, social desirability, and social undesirability. The personality characteristics were categorized into three groups: social desirability, activity, and intelligence. The vocal characteristics were primarily categorized into penetrativeness, clarity, and mildness. The average duration of each sample was three seconds. Each participant rated each of the voices on 22 personality traits and 11 vocal characteristics (e.g., not trembling, not blurred, relaxed, very soft, etc.). A 7-point scale (1=the target voice is most unlike trait; 7=most like trait) was used by the raters. Additionally, out of a pool of 34 common occupations in Japan, each listener selected once occupation for each voice. The participant group of the second study consisted of 15 males and 75 women ranging in age from 18-24 years. The same 25 voice samples from study one were used. The 20 occupational categories selected most often from study one were used. For each occupation, the participants rated each of the 25 voices using a 7-point scale (1=the voice does not match that of a person in the occupation on the checklist; 7=the voice perfectly matches that of a person in the occupation on the checklist). The participants rated each speech sample based on how well the occupation matched each voice.

Results: The first study revealed that the personality traits of conscientious, kind, and safe were positively related to mild (e.g., relaxed, very soft) vocal characteristics. The perception of clarity was most closely associated with the following vocal characteristics: very high and not stiff. The perception of penetrativeness was most closely associated with the following vocal characteristics: not trembling, not blurred, and not stuttering. The second study showed that the occupations were categorized into 3 general groups: service trade (e.g., salesperson, newscaster, taxi driver), outsider type (e.g., gang member, swindler, artist), and authoritative (e.g., politician, lawyer, doctor, policeman). Those in the service trade category were positively correlated with social desirability, activity, and penetrativeness. They were negatively correlated with the vocal characteristic of clarity. The outsider type category was negatively associated with activity, intelligence, and mildness. It was positively associated with penetrativeness. The final

occupational category, authoritative, was positively associated with intelligence. However, it was negatively correlated with social desirability, clarity, and mildness.

Conclusion: Participants consistently attributed personality and vocal characteristics to particular voices and occupations. Significant correlations were found between scores on personality traits and occupational categories. Similarly, correlations were found between vocal characteristics and occupational categories. This study also demonstrated that listeners often subconsciously made stereotypical judgments based on vocal samples alone.

Relevance to the current work: Personality traits were associated with vocal characteristics perceived by listeners. How a listener perceived the speaker in terms of vocal properties had direct links to how they measured their character and attitudes toward them.

Westrop, R. M. (2000). *Segment Durational Changes from Young Adults to Elderly: A Familial Study*. Communication Disorders and Deaf Education. Utah State University. Unpublished manuscript.

Relevance to the current work: This study gathered speech samples from several Utah families, each with a wide range of ages. The purpose was to examine changes in speech production that occurred with age, gender, and family membership. The current study used the spontaneous speech samples that were gathered to perform the listener experiment.

APPENDIX B: Informed Consent

Introduction

This research study is being conducted by Christopher Dromey, Ph.D., and Brittni Bergstrom, BS at Brigham Young University to determine the influence of speaker age and dialect on listener perceptions of personality. You were invited to participate because you are between the ages 18 and 30 and have no history of speech, language, or hearing deficits.

Procedures

If you agree to participate in this research study, the following will occur:

- You will complete a brief hearing screening before completing the listening task
- You will wear headphones and select a comfortable volume level for listening to speech samples
- You will hear several speech samples and be asked to rate them using a computer
- You will complete a brief questionnaire after listening to the speech samples
- The study will take place in the researcher's lab at a time convenient for you
- Total time commitment will be 30 minutes

Risks/Discomforts

The risk associated with participating in this study are minimal. However, loss of personal or academic time may be considered a potential risk.

Benefits

There will be no direct benefits to you. It is hoped, however, that through your participation researchers may learn about listener perceptions as they relate to speaker dialect and age.

Confidentiality

The research data will be kept in a locked room on a password protected computer and only the researchers will have access to the data. A spreadsheet with listener ratings of the speakers will be generated. The file names will be identified by code, not by name or initial. At the conclusion of the study, the data will be archived in the researcher's office. The data files will be indefinitely archived in case future studies require re-analysis of the findings, but will not include any identifying information.

Compensation

You will receive \$5 for your participation; compensation will not be prorated.

Participation

Participation in this research study is voluntary. You have the right to withdraw at any time or refuse to participate entirely without jeopardy to your class status, grade, or standing with the university.

Questions about the Research

If you have questions regarding this study, you may contact Brittni Bergstrom at brittni.e.brewer@gmail.com for further information or Christopher Dromey at dromey@byu.edu.

Questions about Your Rights as Research Participants

If you have questions regarding your rights as a research participant contact the IRB Administrator at (801) 422-1461; A-285 ASB, Brigham Young University, Provo, UT 84602; irb@byu.edu.

Statement of Consent

I have read, understood, and received a copy of the above consent and desire of my own free will to participate in this study.

Name (Printed): _____ Signature: _____ Date: _____