The Uptalk Downgrade

Comparing age- and gender-based perceptions of uptalk in four highly-skilled professions

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Abstract

Uptalk, or the 'innovative use of rising intonation on declarative utterances' (Warren, 2016, p. xiii), is a common intonational contour in New Zealand English that has been assigned an uncommonly large range of meanings. Negative interpretations of uptalk include uncertainty, tentativeness, and lack of expert knowledge (Barr, 2003; Conley et al, 1978; Guy & Vonwiller, 1984; Spindler, 2003; Tomlinson Jr. & Fox Tree, 2010; Warren, 2016), and positive interpretations of uptalk include helpfulness, solidarity, and inclusivity (Borgen, 2000; Britain, 1992; Guy & Vonwiller, 1984; Meyerhoff, 1991; Warren, 2016). There is evidence that a listener's interpretation of uptalk as positive or negative may depend on their age (Di Gioacchino & Crook Jessop, 2010), and there is also conflicting evidence over whether uptalk users are perceived as more or less suitable for highly-skilled employment (Borgen, 2000; Gorelik, 2016; Guy & Vonwiller, 1984; Steele, 1995). In an earlier study (Wollum, 2016), I found that older female listeners (aged 60-70) were significantly more likely than younger female listeners (aged 18-28) to assess a speaker as less competent and less trustworthy when the speaker was using uptalk, in an IT support context. In a further exploration of the age-based perception differences revealed in my 2016 research, this thesis reports a more extensive study, in which a new group of younger (aged 18-30) and older (aged 60-72) female listeners as well as a group of younger and older male listeners assessed recordings from four different young (aged 22-30) female speakers representing four different highly-skilled professions: IT support person, doctor, lawyer, and librarian. Listeners in this study were asked to assess not only the competence and trustworthiness of the speaker, but also the speaker's education level. For both competence and trustworthiness, significant interactions were found between the listener's age group, the profession of the speaker, and the speaker's use or non-use of uptalk, with the older listeners ranking all four professions significantly lower for competence and trustworthiness in the uptalk condition, and a particularly strong effect of these lower ratings for the speaker representing a lawyer. There was also a recurring significant interaction between listener age group and gender, with younger male participants providing significantly higher ratings than all other demographics for both competence and trustworthiness, and significantly higher ratings than all but the older female group for education level. For education level, there was also a significant simple effect of speaker profession. There was no effect of uptalk on perceptions of education level. As all speakers used in the study were young (aged 22-30) females, part of the

demographic that most often uses uptalk in New Zealand (Britain, 1992; Warren & Britain, 2000), the trend of lower competence and trustworthiness ratings from the older listener group is indicative of an out-group effect regarding positive versus negative perceptions of uptalk (House, 2006). In addition, the significant interactions between speaker profession and presence or absence of uptalk suggest that uptalk, considered predominantly a marker of female speech in New Zealand, is perceived more negatively by older listener groups in professions that have been historically male-typed. For competence and trustworthiness, the profession least negatively affected by the use of uptalk was the librarian, a profession that has previously been viewed as predominantly female (Morrissey & Case, 1988; Panek, Rush, & Greenawalt, 1977), and the profession most negatively affected by the use of uptalk was the lawyer, a profession that has previously been described as 'aggressively male' (Bolton & Muzio, 2007, p.56), and rewarding of women who adopt more masculine characteristics (Sommerlad & Sanderson, 1998). This research shows that older listeners are less likely than younger listeners to accept uptalk as indicative of competence and trustworthiness, and that these effects are particularly strong for professions in which women have previously been underrepresented. It also shows that a speaker's perceived profession is more important than the presence or absence of uptalk for a listener assessing the speaker's education level.

1. Literature Review

1.1 Purpose of the Research

This research examines whether the use of uptalk influences listener perceptions of the trustworthiness, competence, and education level of speakers representing five different highly-skilled professions using technical language, and whether any effect of uptalk is dependent on the age or gender of the listener. Uptalk, or the 'innovative use of rising intonation on declarative utterances' (Warren, 2016: xiii), has been argued to have both negative and positive impacts on professional communication, leading to questions as to how it may be perceived differently by different audiences. For example, the use of uptalk is disparaged in many guides to effective professional speaking and communication in the workplace (e.g. Di Resta, 2010; Graham & Reidy, 2009; Guffey, 2006; Guffey & Almonte, 2009; Hustad, 2008), which warn that the use of uptalk can diminish credibility and cause the speaker to sound as if they lack authority or knowledge. Women in particular are cautioned not to use uptalk if they want to be perceived as competent in the workplace, such as in DiResta's (2010) guide for business women where uptalk is listed second on her list of the top ten ways that women sabotage their professional communication. Conversely, previous studies of both the perception and the production of uptalk indicate that it can also be used to express positive communicative functions including politeness, solidarity, helpfulness, and inclusivity (Borgen, 2000; Britain, 1992; Meyerhoff, 1991; Warren, 2016). Such a range of functions could contribute either to decreased or increased perceptions of trustworthiness or competence by uptalk users in professional environments. In addition, there is evidence that uptalk may be perceived as either largely positive or largely negative depending on the listener's age. For example, Di Gioacchino & Crook Jessop's observed that uptalk is a 'jarring trend' (2010, p.13) to older listeners but an unremarkable practice to younger listeners, and Warren (2016, p.49) noted that the intonational inventories of older speakers may cause them to be more likely to interpret uptalk as expressing uncertainty and insecurity. These observations of age-

based perceptual differences are supported by the findings of a study conducted in 2016 (Wollum, 2016), which involved a group of 10 female listeners aged 20-30 and 10 female listeners aged 60-70. The listeners rated the trustworthiness and competence of two different 22-year-old female speakers, one of whom used uptalk and one of whom did not use uptalk. This pilot study indicated that the older listener group consistently rated the uptalking speaker lower for competence and trustworthiness scores, while the younger listener group did not perceive any significant differences for competence or trustworthiness between the uptalking and the non-uptalking speaker. In the previous study (Wollum, 2016), the stimuli were single sentences designed to reflect an IT support context, with only one phrase boundary that either featured or did not feature uptalk. The current research includes three additional highly-skilled professional contexts, involving three further professions that involve the regular use of jargon as well as regular communication and advice-giving to members of the public - these are the professions of doctor, lawyer, and librarian. A further profession, bank teller, served in a pre-test for baseline differences between the voices used in the uptalk study. In addition, the stimuli designed for the current research are short passages involving multiple phrase boundaries where uptalk is either consistently expressed or consistently not expressed, rather than the individual sentences designed for the pilot study that contained only one phrase boundary. The stimuli better reflect the longer narrative contexts in which uptalk is most commonly expressed in New Zealand English (Britain & Newman, 1992). The current research also broadens the listener pool to include both male and female listeners, in order to investigate possible effects of the listener's gender, and has increased the number of participants to 64, with 16 participants in each gender and age group division. Finally, listeners in the current study are asked to assess the education level of the speaker, as well as the speaker's competence and trustworthiness. Expanding upon the pilot study, the current research investigates the following questions:

1. Do the age-based differences revealed in the previous study (Wollum, 2016), in which older listeners rated uptalkers as both significantly less competent and significantly less trustworthy than non-uptalkers, hold for a wider range of highly-skilled professions?

2. Does the presence of uptalk affect listener perceptions of a speaker's education level?

3. Does the gender of the listener influence or interact with the effects of uptalk on the perceived trustworthiness, competence, and education level of a speaker?

4. Does the profession of the speaker influence or interact with the effects of uptalk regarding how listeners perceive their trustworthiness, competence and education level? That is, might some professionals be perceived as more competent, more trustworthy, and more highly educated when using uptalk, and some perceived as less competent, less trustworthy, and less highly educated?

The wide range of communicative goals and communicative effects ascribed to uptalk in the existing literature make it clear that uptalk is perceived differently depending on audience and context. The current research specifically explores uptalk in professional situations, for four professions in which practitioners are required to have a specialised education and are at an advantage if they are perceived as both competent and trustworthy by clients. It explores situations in which the listener may need to rely on uptalk as a prosodic cue to assess the competence, trustworthiness, and education level of a professional, when assessing the validity of advice featuring technical language highly specific to their profession.

1.2 Uptalk in New Zealand English

1.2a Populations using uptalk in NZE

Examples of uptalk in NZE have been noted by Gordon (1998) and Gordon & Trudgill (1999) in Radio New Zealand recordings made of speakers from the 1940s. However, the first academic recognition of uptalk in New Zealand English (NZE) was by Benton (1966) in the speech of 5- to 8-year-old ethnically Māori speakers of NZE. Bauer (1994) states that uptalk became a recognised feature of NZE by approximately 1980, particularly in Māori English, which at the time was predicted to 'show something of the direction in which New Zealand English is likely to develop' (Bauer, 1994,

p.116). Production studies have demonstrated that uptalk is still a more prevalent marker of Māori English than Pākehā English, with both Maclagan, King, & Gillon (2008) and Stubbe (2008) linking the increased use of uptalk in Māori English to the Māori cultural emphasis on *whanaungatanga*, or 'creating a feeling of solidarity' (Maclagan, King, & Gillon, 2008, p. 664). Holmes (2005) and Warren & Bauer (2004) have also shown that uptalk is still strongly associated with Māori English. Britain (1992, p. 95) observed in his study on the distribution of uptalk that members of Pacific cultures value a 'more cooperative conversational style', with uptalk being used to achieve this goal.

Uptalk has also been frequently linked to female speakers, with some research citing similar motivations for women using uptalk as for Māori English speakers using uptalk. Britain's (1992) study found that women were much more likely to use uptalk than men, linking this to an increased motivation among female NZE speakers to 'pursue speech styles based on solidarity and support' (Britain, 1992, p. 94). Britain & Newman (1992) found that in a sample of 60 working-class speakers from Wellington, New Zealand, women of Pākehā descent used uptalk at a rate of 3.9% compared with 1.8% of men. Bell (2000) and Warren & Britain (2000) also provide evidence that uptalk is more likely to be used by women than by men, and that uptalk is more likely to occur when the conversational partner is a woman (Bell & Johnson, 1997). Warren & Daly (2000) further demonstrated that female speakers started their final rises later than males, and that they produced both larger and more rapid rises. These larger and more rapid uptalk rises among women could be a reason why uptalk is more immediately apparent to listeners as a marker of women's speech. As discussed further in section 1.3, uptalk is also linked with some linguistic stereotypes surrounding women's speech, and as a result listeners may be more likely to associate uptalk with women.

Despite initial observations of uptalk emerging in New Zealand in the mid-20th century (Gordon, 1998; Gordon & Trudgill, 1999; Benton, 1966), uptalk continues to be primarily used by younger speakers in New Zealand (Ainsworth, 1994; Allan, 1990; Britain, 1992; Warren & Britain, 2000). Britain & Newman's (1992) research showed that their 20-29 age group used uptalk, on average, at a rate of 4.5 times that of the 70-79 age group. In a comparison of uptalk studies by

Ainsworth (1994), Allan (1990) and Britain (1992), Warren & Britain (2000) found a demonstrably higher rate of uptalk use overall among speakers aged 20-29 than in any other age group, and a lower rate of uptalk use overall among speakers aged 70-79 than in any other age group. Ainsworth's (1994) study of four-year-old children is particularly salient to the age group surveyed for the current research, as she found that the rate of uptalk use among girls was 3.6 per cent compared to boys' 0.7 per cent; children of this age in 1994 would be just on the upper age range of the 18- to 30-year-old participants in the younger age group used in the current research. However, the current rate of uptalk usage among 18- to 30-year-old speakers is not entirely clear due to the age of the most recent corpus results available.

1.2b Contexts in which uptalk is used in NZE

In NZE, the contexts in which uptalk is used correspond with McGregor & Palethorpe's (2008:174) description of uptalk rises as occurring most often 'in task-oriented discourse, such as a narrative, where the intention is to achieve a common goal'. Many previous studies of NZE have observed that uptalk tends to occur most often in narrative contexts, or that it is more likely to occur in sequences of narrative clauses (Ainsworth, 1994; Allan, 1990; Britain & Newman, 1992; Innes, 2007). Specifically, uptalk tends to occur more often in passages where the speaker is occupying a 'leader' role, giving instructions or directions to the listener (Fletcher, 2016). Research by Fletcher (2005) using a map-reading task also found that uptalk was more common in forward-looking dialogue acts, such as giving instructions, in contrast with backward-looking dialogue acts, such as agreement with instructions. Tomlinson & Fox Tree (2011) make a similar distinction between forward-looking and backward-looking functions of uptalk, noting that in a backward-looking dialogue act, uptalk tends to be more associated with uncertainty, while in a forward-looking dialogue act, uptalk indicates that the speaker is about to provide more information to support or clarify their claims. This forward-looking function reflects the interactional meaning of uptalk, serving to establish inclusivity with the listener and ensure that they are following along with what is being said.

1.2c Phonetic realisation of uptalk in NZE

Uptalk occurs at the boundary of an intonational phrase, defined as a stretch of spoken material that has its own distinct prosodic tune (Gut, 2009). Boundary tones are annotated as either High (H%) or Low (L%) (Pierrehumbert, 1980), referring to the relative pitch of the final tone within the speaker's vocal register. The H% boundary tone is a way of describing uptalk using 'tonal targets' (Warren, 2016:13), distinguishing uptalk from falling boundary tones in the L% category. An example of the phonology and rising boundary tone of uptalk is shown in Figure i below, in a speech wave, pitch track, and text grid generated from Praat software (Boersma and Weenink, 2014). This example of uptalk is taken from the data set of Warren, Everhardt, & Wollum (2018), displaying an example of uptalk onset that was consistently assessed by a set of NZE-speaking listeners to be a statement, rather than a question. The speaker in this sample was a 23-year-old female native New Zealand English speaker, reflecting an intersection of the populations in New Zealand most likely to use uptalk.

Figure i. Pitch track representation of uptalk by an NZE speaker
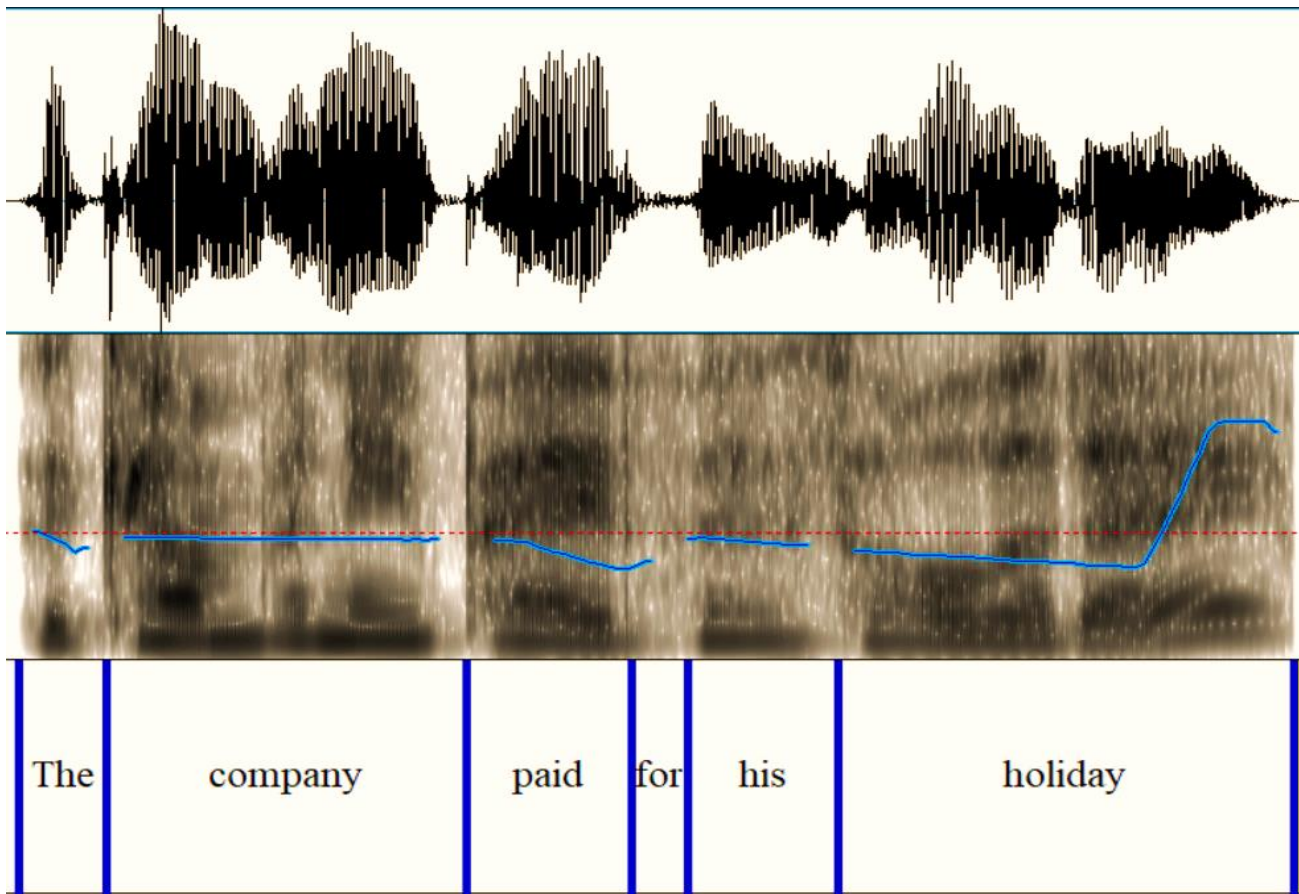
The uptalk rise can be observed here in *holiday*, occurring later than a question-related rise would. There is abundant evidence that in NZE, listeners use the temporal alignment of the rising tone to distinguish between uptalk and question rises, with previous research indicating that uptalk rises are produced with a later starting point in comparison with questions (Fletcher, Grabe, & Warren, 2005; Warren, 2005; Warren, 2016; Warren & Daly, 2005; Warren & Fletcher, 2016). This is also supported by perception data indicating that New Zealand listeners are more likely to perceive instances of uptalk as statements if the temporal alignment of the rise is later, and as questions if the temporal alignment of the rise is earlier (Zwartz & Warren, 2003; Everhardt & Warren, 2017). Moreover, it appears that the temporal alignment of the rise is more important to NZE listeners than the initial starting pitch of the rise *(*Warren, Everhardt, & Wollum, 2018*)*, in terms of distinguishing questions from statements.

1.2d Uptalk in other varieties of English

In addition to NZE, uptalk has also been observed in many other English varieties, including Australian, American, Canadian, British, Irish, South African, Falkland Islands, Caribbean, and Pacific English varieties (Warren, 2016). In many of these varieties, uptalk serves the same functions and is primarily associated with the same contexts and populations as in New Zealand English. Thus, for example, Schneider's (2004,p.1126) comments that uptalk seems to be 'spreading globally among the young'. In Australian English, uptalk was first described by Mitchell & Delbridge (1965, p.56) as an 'interview tune' serving an interactive function of changing topics and inviting further questions, and Guy et al. (1987, p. 23) described uptalk in Australian English as possessing the 'social distribution of a language change in progress', primarily occurring among young women. Similarly, in US English, the first reports of uptalk indicated that it was used more frequently by women (Edelsky, 1979; Ching, 1982) and in narrative contexts (Bolinger, 1978), eventually spreading from women to 'young people of both sexes in many parts of the US' (Wolfram & Schilling-Estes, 2006, p. 124). Studies of Canadian English have also found higher incidences of uptalk use among women (Lacey et al., 1997; Shokeir, 2008) and young people (Halford, 2007). In British English, uptalk seems to have been observed later than in New Zealand, Australian, and US English (Cruttenden, 1997), but has more recently been reported to be 'ubiquitous' (Wichmann, 2011, p. 187), although still more typical of the speech of young women. In Welsh English, recordings dating from 1976 indicate that uptalk was used primarily in narrative texts (Collins & Mees, 1999) , a common thread among New Zealand, Australian, and US dialects. South African English also features uptalk primarily among young, female speakers (Dorrington, 2010), and this variety of English also tends to feature higher rates of uptalk use in narrative contexts. Despite other cultural differences, uptalk serves similar functions - changing topics, checking for understanding, and narrative continuation - and is primarily associated with similar populations - young women - in all of these varieties. Moreover, there are similar complaints and similar benefits claimed about uptalk across most of these varieties, including NZE.

Many of these interpretations are connected with a larger package of stereotypes about how young women speak.

1.3 Interpretations of uptalk

1.3a Negative interpretations

Negative qualities ascribed to uptalk in previous attitudinal studies include uncertainty, tentativeness, lack of confidence, decreased intelligence, and powerlessness (Barr, 2003; Conley et al., 1978; Guy & Vonwiller, 1984; Spindler, 2003; Warren, 2016). Uptalk can signal to listeners that a speaker does not have expert knowledge, such as in Tomlinson & Fox Tree's (2010) study, where it was found that a listener's impression of a speaker's knowledge in a subject was negatively affected by the speaker's use of uptalk. In Brennan & Williams' study (1995, p. 384), uptalk was associated with a decreased 'feeling of knowing', or ability of the speaker to accurately assess and monitor their own knowledge. Ainsworth (1993, p. 284) comments that speakers tend to adopt the uptalk register in order 'to convey uncertainty, to soften the presumptiveness of a direct statement, or to forestall opposition from the addressee', classifying these interactional goals as typical strategies of a speaker who is in a powerless position. Many researchers include uptalk as part of a range of features typifying a powerless or low-status speech style (Conley et al., 1979; Lakoff, 1975; Loyd et al., 2010; Parton et al., 2002; Wiley & Eskilson, 1985), and uptalkers have previously been considered less suitable for higher-status employment (Guy & Vonwiller, 1984).

1.3b Positive interpretations

Previous attitudinal and perception studies have linked the use of uptalk to the positive qualities of attentiveness, expressiveness, politeness, friendliness, solidarity, helpfulness, and inclusivity (Borgen, 2000; Britain, 1992; Guy & Vonwiller, 1984; Meyerhoff, 1991; Warren, 2016). An early study by Guy & Vonwiller (1984) in which listeners were asked to assess texts containing uptalk

and texts not containing uptalk found that while uptalkers were perceived to be less assertive, they were simultaneously perceived as being friendlier, more expressive, and more attentive to the listener's needs than the non-uptalkers. Guy et al. (1987) posited that uptalk, which they refer to as Australian Questioning Intonation has a non-propositional, interactive meaning. With this interactive meaning, the speaker uses uptalk to check that the listener has understood them and is following along with the conversation. This agrees with the conclusions drawn by Bradford (1997, p. 34-35), who described uptalk as 'a bonding technique to promote a sense of solidarity and empathy between speakers and hearers', reducing social distance between speakers and listeners by presenting any new information as shared information between the speaker and listener. Britain (1992) and Warren & Britain (2000) also classify uptalk in NZE specifically as a marker of positive politeness, helping to maintain solidarity and invite participation. Tomlinson & Fox Tree (2010, p.60) similarly describe uptalk as a means of 'common ground management' to ensure that speakers understand one another. The negative perception of uptalk as a marker of tentativeness and insecurity is also challenged by analysis showing that uptalk often occurs in dialogue acts where the speaker would be 'highly motivated to convey the accuracy or acceptability of what they are saying' (Warren, 2016, p. 52), for example in expressions of fact or opinion (Guy & Vonwiller, 1984; Warren & Britain, 2000; Horvath, 2004).

1.3c Links between interpretations of uptalk and stereotypes about uptalkers

Positive and negative interpretations of uptalk are reflected in positive and negative stereotypes about young people and women, the populations who most commonly use uptalk in many English varieties. Although men and older speakers have been observed to use uptalk in different English varieties including in New Zealand (Britain, 1992), Canada (Shokeir, 2008), and the United States (Pratt-Johnson, 2006), uptalk continues to be stereotyped as a marker of youth speech and/or female speech, and to be considered in tandem with the same stereotypes used to judge young people and women. As a result, Warren (2016, p.49) argues that older listeners hearing uptalk, especially

when produced by younger speakers, are in the 'out-group' and are more likely to interpret uptalk as expressing insecurity or uncertainty, whereas younger listeners are part of the 'in-group' that would more likely to interpret uptalk as expressing openness and inclusivity. This agrees with Di Gioacchino & Crook Jessop's remarks that uptalk is a 'jarring trend' (2010, p.13) to older listeners, but an unremarkable and therefore accepted practice for younger listeners. In a survey of 183 media items mentioning or discussing uptalk in English-language publications, Warren (2016) found that discussion of uptalk occurred predominantly in articles about young adults or teenagers, and that any mention of speaker sex was used to mention that uptalk is a 'typical female trait' (Warren, 2016, p. 129). Of these media items, the majority took a neutral or overtly negative stance, with the tone especially likely to be negative if uptalk was the primary focus of the piece (Warren, 2016). The findings of Warren's media review correspond with Eckert's (2008) observation that the 'construct of inarticulate female/adolescent language is popular in the media' (2008, p. 394), with uptalk used as a token to justify negative views of women's speech or youth speech, and vice versa. Similarly, Ainsworth (1993) remarks that the view of uptalk as an expression of uncertainty or incredulity is a 'gender-linked paralinguistic trait' (p.282), with the links between uptalk and powerlessness 'intimately connected to the subordinate position of women' (p.284). Stereotypes about women's speech are also present in positive perspectives on uptalk, such as the ability of uptalk to represent 'the facilitative patterns which characterise women's speech in general' (Holmes, 1993, p.111), allowing female professionals in leadership positions to ensure the success of an interaction.

1.4 Perceptions of expertise in employment involving technical language

Technical language is defined as 'lexical items that have a limited circulation and are only accessible to those with some knowledge of the field' (Lipovsky, 2006, p.1171). Provided it is used appropriately, the use of technical language can highlight a speaker's competence in their field (Gumperz, 1992; Lipovsky, 2006), and the use of technical language is linked with the perception of

success in highly-skilled positions (Hopper & Williams, 1973). However, when combined with a speech practice that has previously been linked with interpretations of uncertainty, lack of authority, and powerlessness, the benefits of technical language use could be diminished.

Many guides on workplace communication warn against the use of uptalk in professional situations, cautioning that uptalk use can diminish credibility and cause the speaker to sound as if they lack specialised knowledge (Graham & Reidy, 2009; Guffey, 2006; Guffey & Almonte, 2009; Hustad, 2008). This is especially true for women, who are particularly negatively affected by the stereotype of uptalk as a characteristic of powerless or low-status speech (Ainsworth, 1993; Borgen, 2000; Bradac & Mulac, 1984; Lakoff, 1975; Parton, Siltanen, Hosman, & Langenderfer, 2002). Borgen's (2000) research found that uptalk users were perceived as less suitable for highly-skilled, high-status jobs than their non-uptalking counterparts, and Parton et al. comment that 'questioning forms or use of rising, question intonation in declarative form are perceived as powerless and ineffective, frustrating the intention of the would-be communicator' (Parton et al., 2002, p.146, after Bradac & Mulac, 1984). Parton et al.'s (2002) research, a perception study in which participants were asked to assess different interviewees for dynamism, social attractiveness, competence, and employability, found that interviewees using a 'powerful speech style' (p.144), were rated significantly higher for competence, in contrast with those using a 'powerless speech style laced with...questioning forms (use of rising, question intonation in declarative form)' (2002, p.146). Loyd, Phillips, Whitson, & Thomas-Hunt (2010) warn that individuals who possess speech characteristics signalling low status may not be expected to have expert knowledge, and that the expert knowledge they do have may be 'undervalued by others' (p.380) if they express this knowledge using low-status or powerless speech characteristics. If highly-skilled individuals in high-status positions are perceived to be using speech characteristics perceived as powerless or indicative of low-status positions, this may 'violate behavioural expectations' (Loyd et al., 2010, p.382). This violation of expectations, or incongruity of behaviour regarding how a highly-skilled professional is expected to speak or act, tends to result in a reduction in the speaker's perceived trustworthiness (Morgan & Hunt, 1994). Listeners who do not

perceive 'consistency between expectations and behaviour of the speaker' (Loyd et al., 2010, p.382) are less likely to trust what the speaker is saying.

Previous studies have examined the connections between uptalk and employability or suitability for highly-skilled professions (Borgen, 2000; Gorelik, 2016; Guy & Vonwiller, 1984; Steele, 1995), with varying results. In Guy & Vonwiller's (1984) study of uptalk in Australian English, listeners rated uptalkers as being less suitable for high-status employment, a finding that was replicated by Borgen (2000) for New Zealand English. However, Steele (1995) found that use or non-use of uptalk made no difference to the level of occupation deemed suitable for the speaker, and similarly, Gorelik (2016) found that the presence of uptalk in the speech of a job candidate did not significantly affect perceptions of the candidate's employability. There is also evidence that uptalk is used by people in positions of authority or leadership to ensure the success of an interaction (Brazil, 1997; Cheng & Warren, 2005; Holmes, 1993).

1.5 Choice of professions used in the current study

1.5a Doctor

The use of technical language by doctors and other healthcare professionals is viewed as 'important to orient a patient to language that is likely to be encountered in the course of medical care and treatment' (Roter, 2001, p.82). Castro, Wilson, Wang, & Schillinger (2007, p.S92) observe that doctors may use unclarified technical language with their patients in order to 'assert their professionalism', and to place themselves in a position of authority relative to the patient. Similarly, Berman, Dwyer, Kerr, Aizer, Schwartzman-Morris, Bass, Fields, Blanco, Huang, Krasnokutsky-Samuels, Paget, Kang, Davidson, Lazaro, & Pillinger (2016) characterise the use of technical language by doctors as a lack of willingness or ability to 'meet the patient on their level' (p. 2097), with technical language serving as a means of setting up a powerful-powerless dynamic between doctor and patient. If this type of powerful register is what listeners expect and perceive as professional in a medical context, they may find the use of uptalk to be confronting, as it has previously been associated

with a more powerless speech style. This could reduce ratings of competence or trustworthiness.

However, research on technical language by doctors also emphasises the importance of good

communication skills (Berman et al., 2016), awareness of possible patient comprehension difficulties

(Bourquin et al., 2015), and evidence that the doctor-patient relationship is improved when the doctor

employs communication strategies focused on 'checking for understanding' (Bourquin et al., 2015,

p.325). Uptalk, which is well-documented as a communication strategy that allows the speaker to

check for understanding (Guy & Vonwiller, 1984; Britain, 1992, could therefore improve competence

and trustworthiness perceptions in a doctor-patient scenario.

1.5b Lawyer

Studies by Conley, O'Barr, & Lind (1978) and Innes (2007) have both focused on speech

characteristics in courtrooms, with both studies specifically mentioning uptalk or HRT intonation.

Conley, O'Barr, & Lind (1978) categorised uptalk as a feature of the 'powerless' style of testimony, due

to its increased occurrence among witnesses and courtroom actors with 'little social power' (p. 1380),

specifically the poor, uneducated, or female. Both male and female speakers were ranked significantly

lower on metrics of trustworthiness and competence when using the powerless speech characteristics

(Conley, O'Barr, & Lind, 1978, p.1394). A lawyer, acting in a position of power in the courtroom,

might want to avoid speech practices that are more typical of the more powerless, and which result in

a reduction in ratings of competence and trustworthiness, which are two of the three metrics included

in the current study. More recent research by Innes (2007), which specifically focuses on uptalk in

New Zealand courtrooms, presents some contrasting results. Although Innes does observe that judges

and lawyers in her study fell below the overall rate of uptalk use for each of the cases in which they

were involved (Innes, 2007, p.236), she finds no definitive links between the use of uptalk and social

status or social power. Instead, she finds a link between uptalk use and the speaker's role in the

courtroom, noting that lawyers' use of uptalk served a wide range of functions, including

communicating 'politely and facilitatively in co-examination yet confrontationally (although still often

politely) in cross-examination' (Innes, 2007, p.252). Conley, O'Barr, & Lind's (1978) study, published nearly forty years ago, shows that uptalk has historically been viewed as a negative marker of competence and trustworthiness, placing lawyers in a position of powerlessness that would be more typical of witnesses. Based on these findings, it is possible that the older participant group involved in the current research would be more likely to view uptalk negatively in a legal context, although it is also possible that their opinions may have changed given the intervening decades. In contrast to Conley et al. (1978), Innes' more recent research (2007) shows that lawyers do use uptalk in the real world for a wide range of functions, suggesting that the younger participant group may be more likely to view uptalk in a legal context as acceptable and reflective of trustworthiness and competence.

1.5c Librarian

Similar to the other professions explored in the current research, librarianship involves using specific technical language while also using effective communication tactics to ensure that the user follows along and understands the message. Kupersmith (2012) and Chaudhry & Choo (2001, p.348) both recommend that librarians continue to use technical language, as ' it is hard and sometimes impractical to speak of everything in layman's terms'. Although it may be impractical to avoid technical terms in a library context, Naismith & Stein (1989) stress the need to avoid a 'vertical relationship' (p.545) in which the librarian is situated as superior to the user. Instead, Naismith & Stein (1989) advocate for a 'horizontal relationship' (p.545) between librarian and library user, in which 'communication is positive and nonthreatening' (p.545). Ideally, the library user should feel they are being treated 'with respect as an equal' (Naismith & Stein, 1989, p.545) by the librarian. Uptalk, which has previously been characterised as a deliberately non-threatening and as a communication style used to 'avoid confrontation' (Warren, 2016, p.50) as well as a means of reducing social distance (Bradford, 1997; Britain, 1992; Meyerhoff, 1991; Warren, 2016), could be perceived as a tactic for negotiating this relationship of equals between librarian and library user, and could make the listener perceive the speaker in the librarian role as more trustworthy or competent.

1.5d Bank teller

Like the other four professions used in the uptalk survey, bank tellers are regularly required to give advice to members of the public, often while using context-specific technical language. Notably, the bank teller profession was not specifically tested in the current research for the effects of uptalk on competence and trustworthiness - instead, this profession was chosen for use in the Voice Comparison Survey (VCS), which did not feature any uptalk and served to determine whether the speakers used for the other four professions exhibited any other speech features unrelated to uptalk that could influence listener participants' responses. The bank teller profession was also used for the initial practice passages for the uptalk survey, which featured uptalk expressed on some but not all phrase boundaries, serving to accustom participants to the design of the survey. This profession was chosen because bank tellers and interviewees for banking positions have featured in previous studies of powerful versus powerless speech (Gorelik, 2016; Parton et al., 2002; Wiley & Eskilson, 1985), which have characterised uptalk as a powerless speech feature. In particular, Gorelik (2016) found that the presence or lack of uptalk did not affect ratings of competence for two female candidates for a bank teller position. This makes the bank teller profession ideal for the practice passages featuring uptalk.

1.5e IT Support

The IT support profession was chosen because it has been previously demonstrated that the presence of uptalk has an effect on perceptions of competence and trustworthiness in this profession, and that these perception differences also depend on the age of the listener (Wollum, 2016). It is prudent to include this profession in the current study, as the current study is a further investigation of the patterns and significant effects discovered in the 2016 study specifically for this profession. In the 2016 study, IT support was chosen as the profession to be featured because advice from IT support professionals suits both the 'task-oriented discourse' (McGregor & Palethorpe, 2008, p.174) and forward-looking functional contexts (Fletcher, 2005; Fletcher, 2016; Tomlinson & Fox Tree,

2011) of uptalk, in which uptalk tends to be used as a way of indicating that the speaker is about to provide further information or clarification. IT support professionals are also advised to use standardised jargon highly specific to their profession in order to facilitate greater efficiency of issue resolution (Wheatcroft, 2014, p.20), meaning that an IT support professional might be easily distinguished from another type of skilled professional due to the jargon they use. The results of the 2016 study are summarised below.

1.6 Results of the 2016 study

The IT support position included in the current research is a means of connection and comparison with a study conducted in 2016 (Wollum, 2016), which showed significant differences in the way older women (aged 60-70) and younger women (aged 18-28) perceived the trustworthiness and competence of uptalk in the context of IT support. The current research is a further exploration of the age-based differences revealed in this previous study. The stimuli for the 2016 study consisted of single sentences with only one IP boundary, and these stimuli have been expanded in the current study to three-sentence advice narratives with six IP boundaries, better reflecting the narrative context in which uptalk is most commonly observed in NZ English (Britain, 1992; Warren, 2016) as well as providing listeners with more instances of uptalk. The current study also requires listeners to assess 20 passages as opposed to the 8 sentences used in the study, with 5 passages per profession. In the 2016 study, listeners heard the same profession in two different conditions (uptalk and non-uptalk), whereas in the current study, no listener heard the same profession in both conditions, with the study counterbalanced to ensure that half of the listeners heard two of the four professions in the uptalk condition, and half of the listeners heard the other two professions in the uptalk condition. Listener participants were asked to use a scale ranging from 1-10 to rank the trustworthiness and competence of two different 22-year-old female NZE speakers, one of whom delivered four passages of technical support advice containing uptalk at each IP boundary, and one of whom delivered four

passages of technical support advice without uptalk. Predictive models have been formulated using the linear mixed effects regression models using *lmer* in the *lme4* package (Bates, Maechler, Bolker, & Walker, 2015) in R (R Core Team, 2014). The *mixed* function in the *afex* library (Singmann, Bolker, & Westfall, 2015) was used to assess the significance level of predictors, via model comparison using the Kenward-Roger's (KR) approximation. The predictor variables in the models for both competence and trustworthiness were Age Group (18-28 or 60-70) and Condition (Non-uptalk or Uptalk), with a random intercept for Narrative (the eight passages each participant heard). The overall design of the model was therefore:

[outcome variable: Competence / Trustworthiness] ~ Age Group * Condition + (1 |Narrative)

Figure ii shows the output of this predictive model for the Competence variable:

Figure ii. Effect of Age Group and Condition on Perceptions of Competence
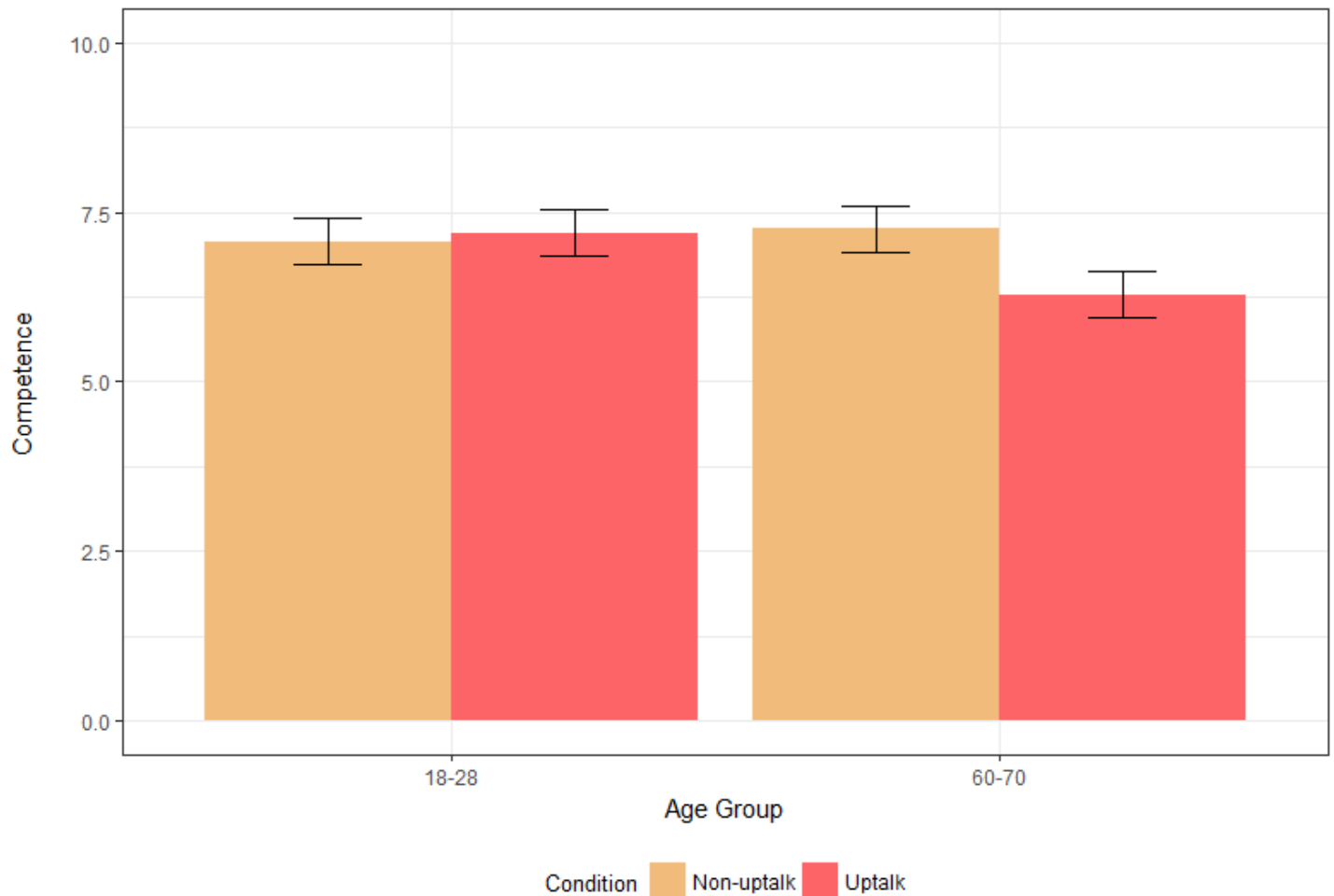
For the 18-28 listener group, the presence or absence of uptalk does not result in any significant difference in competence ratings. In addition, there is no significant difference in competence ratings when comparing the 18-28 listener group and the 60-70 listener group in the Non-uptalk condition. However, a pairwise comparison test between the two listener age groups in the Uptalk condition revealed a significant difference (p=0.04), with the 60-70 listener group predicted to provide lower ratings than the 18-28 listener group for Competence in the Uptalk condition. A pairwise comparison test between the two conditions within the 60-70 listener group also revealed a significant difference (p=0.03) for perceptions of competence, with the older group significantly more likely to rate speakers lower for Competence in the Uptalk condition compared with the Non-uptalk condition. The lack of a significant difference between conditions for the younger listener group, in comparison with the significant difference between conditions for the older listener group, indicates that the use of

uptalk is less salient as a marker of competence for younger listeners than for older listeners, for female listeners assessing passages related to IT support. This perception difference is supported by the reputation of uptalk as a linguistic feature that is more commonly used and more commonly accepted by youth. Figure iii shows that a similar trend was demonstrated for the Trustworthiness variable:

Figure iii. Effect of Age Group and Condition on Perceptions of Trustworthiness
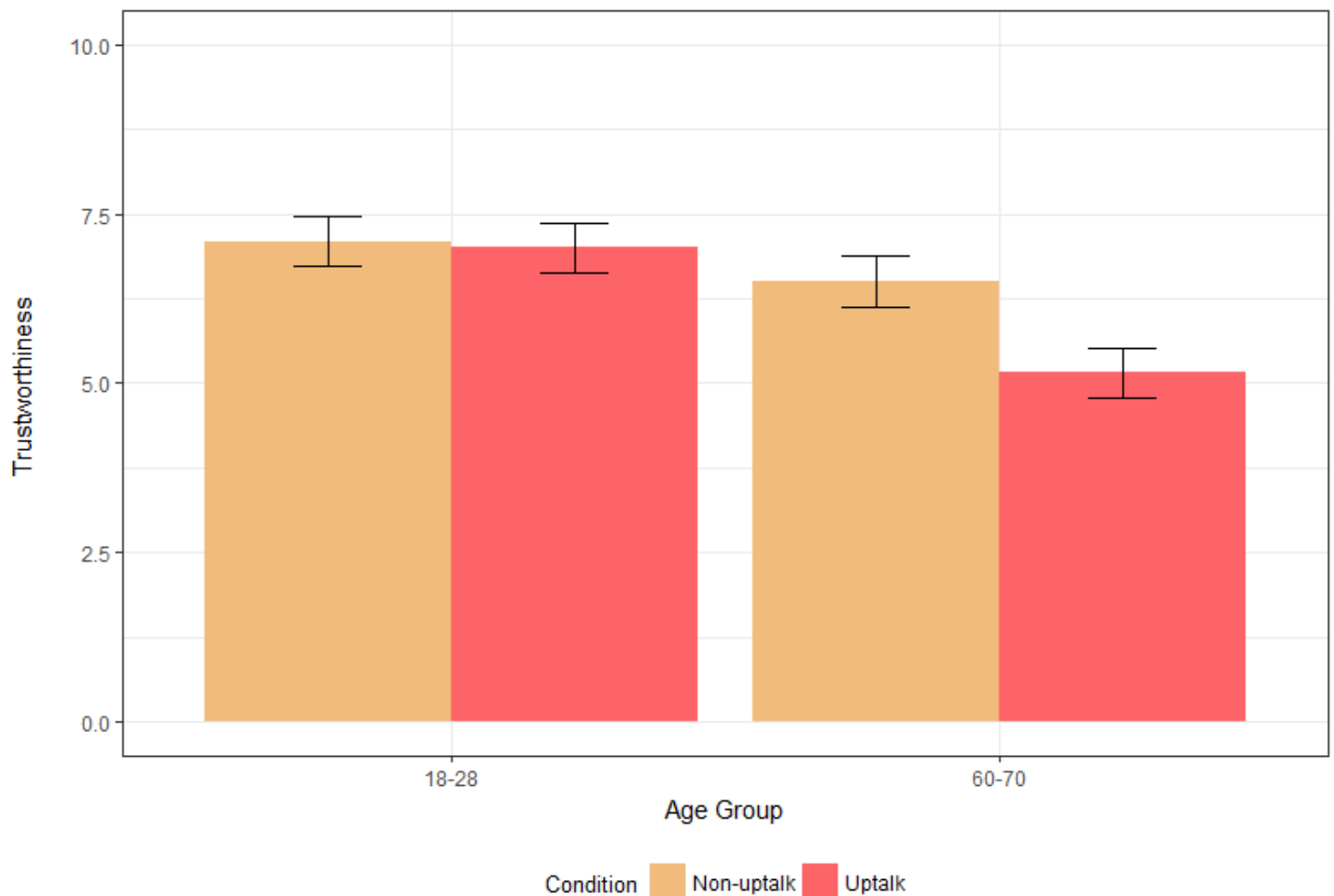
For the Trustworthiness variable, significant effects were predicted for Age Group ($p<0.01$), Condition ($p=0.03$), and the interaction between Age Group and Condition ($p=0.06$). In a similar trend to the Competence variable, pairwise comparison tests revealed no significant difference when comparing trustworthiness ratings between conditions for the 18-28 listener group, and no significant difference when comparing ratings between listener age groups for the non-uptalk condition. However, a

pairwise comparison test again revealed a significant difference when comparing trustworthiness ratings between conditions for the 60-70 listener group (p<0.01), with the older listener group providing significantly lower trustworthiness ratings in the Uptalk condition. Within the Uptalk condition, another pairwise comparison test showed that the older listener group provided significantly lower ratings than the younger listener group (p<0.01), a similar trend but a higher level of significance than what was observed for the Competence variable. As with the Competence variable, the significant differences found for the Trustworthiness variable show that the presence of uptalk is a more salient marker of trustworthiness for older listeners than for younger listeners. A Pearson's correlation test also showed that there was a strong, positive relationship between the Competence and Trustworthiness variables (r=0.83), providing further statistical proof that the two categories are connected for listeners. Older listeners were more likely to have a more negative view of the speaker overall when the speaker was in the Uptalk condition, with both the competence and trustworthiness categories affected negatively by the use of uptalk.

The 2016 study indicated a pattern deserving of further exploration on a larger scale. The 2016 study involved only female listener groups, listening to female speakers deliver passages that would be found in a IT / computer technical support environment. In the 2016 study, each item involved only one intonational phrase, concluding with one instance of uptalk in the Uptalk condition, and concluding with no final rise in the Non-uptalk condition. Despite these limitations, a clear pattern emerged in the study that forms the basis of the hypotheses for the current study, which includes a wider variety of professions, longer passages better reflecting the narrative contexts in which uptalk is usually found in NZE (Britain, 1992), and the involvement both male and female listener participants.

1.7 Implications for the current research

The current research was designed to consider the populations most frequently using uptalk, the phonetic realisation of uptalk, and the contexts in which uptalk is most frequently used in NZE. It

is advisable to consider these factors for the current research in order to minimise the effect of expectational incongruity on participant responses; for example, listener participants who speak NZE would find the use of uptalk to be extremely incongruous to their expectations if they heard it used by a 70-year-old male speaker, and their responses to the survey might be disproportionately influenced by the jarring effect of hearing a speaker who would be exceptionally unlikely to use uptalk. As a result of observed patterns in New Zealand English, the five speakers recruited for the current research were all female and aged between 20 and 29. Given that the four groups of listeners were females aged 18-30 (overlapping with the speakers in both gender and age), females aged 60-72 (overlapping with the speakers in gender but not age), males aged 18-30 (overlapping with the speakers in age but not gender), and males aged 60-72 (no overlap with the speakers in gender or age), it is possible that some in-group vs out-group effects may emerge (House, 2006). As well as being the group least likely to use uptalk in NZE (Warren & Britain, 2000), the older male listener group in the current research is the furthest removed from the gender and age peer group of the speakers featured in the uptalk study, which could result in this group assessing the speakers more negatively. The bias in NZE for perceiving an instance of uptalk as a statement if the temporal rise is later in the IP was also taken into account for the stimuli in the current study, which were manipulated to ensure that all stimuli containing uptalk would be more likely to fall on the statement side of the perception spectrum. For the current research, all stimuli were designed as short narrative passages offering advice to the listener about how to solve a problem, in order to better reflect the context in which uptalk is usually found in NZE.

The five professions represented in the current research (bank teller, doctor, IT support, lawyer, and librarian for the uptalk study) were chosen because all five involve sharing information with people outside of the profession in an assistance or advice-giving context, as well of the use of jargon specific to the profession. If listeners feel that uptalk is not an appropriate register for the professions represented in the current research, or that uptalk is less appropriate for some professions than for others, they may focus on negative interpretations of uptalk, and provide lower

ratings for competence, trustworthiness, and speaker education level accordingly. However, if listeners are focused on the largely positive information-sharing and common ground establishment functions of uptalk, their ratings for competence, trustworthiness, and education level may be positively affected. The results of this survey will speak to whether the perception of uptalk as a sociophonetic variable changes over time, and whether the perception of uptalk as a positive or negative signifier depends on its audience. Listeners often rely on prosodic as well as semantic cues to determine whether information is coming from a competent, trustworthy, or highly-educated source. This research investigates whether the prosodic cue of uptalk affects these judgments in a positive or negative manner, and whether this differs by listener age and gender as well as by the profession of the speaker.

2. Methodology

2.1 Participants

2.1a Speakers

Studies from a wide range of speech communities have reported a higher incidence of uptalk among female speakers in comparison with male speakers, including New Zealand (Bell and Johnson, 1997; Britain, 1992; Britain and Newman, 1992; Warren and Britain, 2000; Warren, 2005), Australia (Guy and Vonwiller, 1989; Courtney, 1996), Britain (Barry, 2008; Bradford, 1997), Canada (Shokeir, 2008; Talla Sando, 2009), and the United States (Barry, 2008). In addition, uptalk has been observed as a more common feature of youth speech (Britain, 1992; Courtney, 1996; Warren and Britain, 2000; Wolff, 2000; Fletcher and Harrington, 2001). As previously discussed, many negative perceptions of uptalk, such as uncertainty, lack of confidence, and powerlessness, are linked to negative stereotypes of women's speech and youth speech ((Lakoff, 1975; Eckert, 2008). For these reasons, the five speakers selected for this study (one for the voice comparison survey and four for the uptalk survey) were all female NZE speakers under the age of 30, who each had at least three years of experience in the profession they represented through previous or current employment. This work experience also meant that they could provide assistance in checking the coherence of the narrative passages they delivered for the study. All five speakers were provided with the passages they would be recording two weeks prior to their recording session, and were informed that they would be recording the passages in both an uptalk condition and a non-uptalk condition. This also allowed the speakers time to rehearse the passages to sound extemporaneous rather than scripted, as well as time to practice producing uptalk naturally using the late rise pattern that is both produced and perceived in New Zealand English as signifying a statement (Zwartz & Warren, 2003; Warren, 2005; Warren, Everhardt, & Wollum, 2018). Although the speakers were not habitual users of uptalk themselves, they were familiar with the practice and did not personally hold any negative views towards its use in

professional environments. During their recording sessions, the speakers were allowed to record multiple takes of the passages in both conditions in order to minimise disfluencies and stilted speech. In the uptalk condition, the speakers were coached by the researcher regarding the nature and realisation of uptalk statements in New Zealand English. This coaching took the form of providing the speakers with audio examples of uptalk on statements in New Zealand English, from Warren, Everhardt, & Wollum (2018). The audio provided to the speakers demonstrated examples of the later rise point that is recognised by NZE listeners as uptalk. If the speaker did not naturally produce uptalk reflective of this later rise point, Praat was used to manipulate the examples of uptalk to reflect this later rise point. One of the speakers produced entire intonational phrases in the uptalk condition with a higher pitch than in the non-uptalk condition, and required further coaching in order to confine the higher pitch to the uptalk movement at the end of the intonational phrase. Unfortunately, there was no objective check of the naturalness of the resulting uptalk stimuli after the speakers were coached, so it is possible that the results were influenced by some uptalk statements sounding less natural than others.

2.1b Listeners

A gender-balanced group of 32 native NZE speakers (16 aged 18-30 and 16 aged 60-72) were recruited to participate as listeners in the Voice Comparison Survey (VCS), and a gender-balanced group of 64 native NZE speakers (32 aged 18-30 and 32 aged 60-72) were recruited to participate as listeners in the uptalk study. The 64 participants in the uptalk study had never been employed or trained in any of the five professions represented within the two surveys.

2.2 Materials and survey design

Both the Voice Comparison Survey (VCS) and the Uptalk survey were created using Qualtrics software (Qualtrics, Provo, UT). Due to the logistical challenges of scheduling test times and transport

for 96 total participants across the VCS and uptalk surveys, the decision was made to send a link to the survey via email rather than to have all participants complete the survey in identical studio conditions. Although this means that individual variables such as background noise or quality of audio setup could not be controlled for each participant, the instructions for both surveys specified that participants should wear headphones and complete the survey in an area with a minimum of background noise. Participants were also informed in the instructions for the survey that they would only be able to hear each item once, and that it would be advisable to adjust their volume levels for the three practice items at the beginning of the survey. No participants reported audio issues or difficulty with accessing the link to the survey.

2.2a Voice comparison survey (VCS)

Survey design

The 32 participants for the uptalk study were separated into two groups of 16:

Group I: 16 speakers aged 18-30 (8 female, 8 male)

Group II: 16 speakers aged 60-72 (8 female, 8 male)

The purpose of the VCS was to determine whether any additional perceived differences between the speakers, unrelated to uptalk, might influence the results of the uptalk survey. The survey involved 32 listeners (8 female participants aged 18-30, 8 male participants aged 18-30, 8 female participants aged 60-72, and 8 male participants aged 60-72), as opposed to the 64 participants involved in the uptalk survey. This was because the uptalk survey had two versions to allow for the counterbalancing of professions, meaning that all participants in the uptalk survey would always hear the same profession in the same condition (ie uptalk or non-uptalk). In the VCS, all listener participants were presented with the same survey. Listeners did not have to choose the profession of the speakers in the VCS, as they were informed in the instructions for the survey that all of the speakers were representing bank tellers. The VCS consisted of 20 different question sets in which

listeners were asked to assess the competence, trustworthiness, and education level of the four

speakers used in the uptalk survey, who delivered five passages corresponding to the *bank teller*

profession with no uptalk present in any of the passages.

The 20 question sets were made up of five blocks, which included four versions of the same narrative

passage delivered by the four different speakers. Order of speakers in each block was varied, so that

no participant heard the same speaker twice in succession, or the same pattern of two speakers in

succession more than once. Listeners were asked if they knew or were familiar with the voice of the

speaker on the first occurrence of each speaker, and were automatically exited from the survey if they

answered 'yes'. A sample question from the VCS is shown below in Figure iv.

Figure iv. VCS Sample Question

Click for audio:

▶ 0:00 / 0:13 ●——— ◀)) —● ⬇

Based on the audio file you heard, how would you rate the speaker's skill level or competency?

Unskilled / novice   Highly skilled / expert

Based on the audio file, how trustworthy do you find this person's advice?

Highly untrustworthy   Extremely trustworthy

Based on the audio file, what do you believe would be this person's highest education level?

○ Pre-high school

○ High school graduate

○ Vocational degree

○ Bachelor's degree

○ Postgraduate qualification (Master's, PhD)

○ Other (please write in)

Do you recognise this voice, or have you previously met the person who spoke this passage?

○ No

○ Yes

Participants could listen to each audio file only once, and were informed of this at the beginning of the survey. VCS listener participants rated the competence, trustworthiness, and education level of the four speakers, with a question format nearly identical to the design of the uptalk survey (with the only

difference being that listeners did not have to select the profession they believed the speaker to be in). Competence and trustworthiness were rated on continuous sliding scales, with the slider bar placed on the midpoint of each scale and listeners required to move it to either the left (less competent / less trustworthy) or the right (more competent / more trustworthy) as they saw fit. Participants were not able to continue to the next question if they did not move the sliding bar for the competence and trustworthiness metrics, although they were still able to move the bar back to the midpoint of the scale if they saw fit. The 'education level' question was multiple choice, including an 'Other' option. The survey was also programmed so that listeners were unable to answer the competence, trustworthiness, and education level questions until they had listened to the complete audio file. Listeners were specifically informed in the instructions for the survey that each of the speakers was a female native speaker of New Zealand English under the age of 30, and that they should base their judgments on their overall impressions of the speakers if they did not understand some of the semantic content of the passage.

Stimuli

The structure of each of the passages was as follows, exactly mimicking the phrasal and syllabic structure of the passages in the uptalk survey:

[Intonational phrase (IP) concluding with a two syllable word with initial stress]. [IP concluding with a two syllable word with initial stress], [IP concluding with a one-syllable word]. [IP concluding with a one-syllable word], [IP concluding with a three syllable word with initial stress].

Example:

I would consider cancelling your direct **debit**. The locked in policy applies to your **savings**, so have a look at your APs and future withdrawals before setting up any **more**. If you need to make a transfer there will be a break **fee**, so you should consider your liabilities **carefully**.

The stimuli were structured in this way following on from previous research in which words containing uptalk contained stress in the initial position (Warren, Everhardt, & Wollum, 2018). All of the stimuli were constructed to have identical IP structures, as well as identical syllabic emphasis for the uptalked words, in order to minimise any response variation that could result from hearing different IP and syllable patterns. As in the example above, the final word of each IP was underlined and bolded in order to indicate to the speakers where it was appropriate to mark phrase boundaries, as well as where to place examples of uptalk in the uptalk condition. Each of the five passages featured six terms deemed by resources on banking jargon (Commission for Financial Capability, 2017; Financial Markets Authority, 2017; Gorelik, 2016) to be technical terms specifically associated with the banking sector and unlikely to be understood by the general public. A full list of the passages used in the VCS is located in part A of the appendices.

2.2b Uptalk survey

Survey design

The 64 participants for the uptalk study were separated into four groups of 16:

Group I: 16 speakers aged 18-30 (8 female, 8 male)

Group II: 16 speakers aged 18-30 (8 female, 8 male)

Group III: 16 speakers aged 60-72 (8 female, 8 male)

Group IV: 16 speakers aged 60-72 (8 female, 8 male)

The survey was counterbalanced so that all listener participants heard all professions, with two in the uptalk condition and two in the non-uptalk condition. This meant that participants never heard the

same profession in both the uptalk and the non-uptalk condition, which was consciously avoided as it could exacerbate the negative effects of uptalk. Groups I and III completed a version of the survey in which the professions of *doctor* and *IT support* were represented by the uptalk passages, and Groups II and IV completed a version of the survey in which the professions of *lawyer* and *librarian* were represented by uptalk passages, as shown in Table i below:

Table i. *Format of uptalk surveys*

Profession	Stimuli in non-uptalk condition	Stimuli in uptalk condition
Doctor	II, IV	I, III
IT support	II, IV	I, III
Lawyer	I, III	II, IV
Librarian	I, III	II, IV

The ordering of the passages was identical for both versions of the survey, and no profession was represented with two passages in succession, with the only difference between the two surveys being which professions were represented with uptalk. The choices of which professions to represent with uptalk in each version of the survey were motivated by their placement in the most recent version of the New Zealand Socio-economic Index (NZSEI) from Statistics New Zealand (Fahy, Lee, & Milne, 2017), as well as data from Careers NZ (2018) and the results of the VCS survey. The professions of *doctor* and *lawyer*, which had the highest rankings in the NZSEI out of the four professions used in this study, were represented by uptalk in different versions of the survey in order to minimise the effect of occupational privilege. Data from Careers NZ (2018) also shows that *doctor* and *lawyer* both require a specialised postgraduate qualification in order to be a practitioner, whereas *IT support* and *librarian* do not necessarily require a postgraduate qualification for entry into the career. As will be discussed in the results section of this paper, the two voices portraying the doctor and lawyer were also assessed by listeners as being the most competent and most trustworthy (in the absence of

uptalk, and when delivering bank teller passages), providing further justification for putting these two voices into different versions of the survey.

As in the VCS, listeners were informed in the instructions for the survey that each speaker was a female native speaker of New Zealand English aged under 30, and were also specifically instructed to focus on other vocal qualities of the speaker if they did not understand the semantic content of the passage. Listeners were asked to use a continuous sliding scale to rate the competence or skill level of the speaker, ranging from 'Unskilled / novice' to 'Highly skilled / expert', and the trustworthiness of the speaker, ranging from 'Highly untrustworthy' to 'Extremely trustworthy'. Using a multiple choice menu, they were asked to rank what they perceived to be the speaker's highest education level, ranging from 'pre-high school' to 'postgraduate qualification', and finally they were asked to select the profession they believed the speaker to be in, with the options of 'Doctor', 'IT / Tech support', 'Lawyer', and 'Librarian'. This final question served as a test of whether the narrative passages accurately reflected the professions for which they were specifically designed, from the perspective of the listeners. The decision not to include an 'Other' category as an option for the speaker's profession was intentional, in order to encourage listeners to specifically consider the four listed professions when listening to the audio file. A sample question for the uptalk survey is shown below in Figure v.

Figure v. Uptalk survey sample question

Click for audio:

▶ 0:00 / 0:15 ●———— 🔊 —● ⬇

Based on the audio file you heard, how would you rate the speaker's skill level or competency?

Unskilled / novice   Highly skilled / expert

Based on the audio file, how trustworthy do you find this person's advice?

Highly untrustworthy   Extremely trustworthy

Based on the audio file, what do you believe would be this person's highest education level?

○ Pre-high school

○ High school graduate

○ Vocational degree

○ Bachelor's degree

○ Postgraduate qualification (Master's, PhD)

○ Other (please write in)

Which of the following professions do you think the speaker is in?

○ Doctor

○ IT / Tech Support

○ Lawyer

○ Librarian

In order to familiarise listeners with the design of the survey, two practice passages featuring a fifth speaker delivering one of the bank teller passages were included at the beginning of the survey. This speaker was also a female speaker of NZ English aged under 30, who had previous work experience as a bank teller. The practice passages in the uptalk survey featured a mix of uptalk and non-uptalk tokens prior to IP boundaries, in order to familiarise listeners to both types of speech.

Stimuli

The stimuli for the uptalk study were designed to reflect the increased presence of uptalk in narrative passages (Warren & Britain, 2000; Innes, 2007), as well as the presence of uptalk in directive, forward-looking tasks (Warren & Fletcher, 2016). The study featured five narrative passages corresponding to the professions of *doctor*, *IT support person*, *lawyer,* and *librarian*, with a duration of between 12 and 19 seconds for each passage, and an average length of 14.91 seconds for each passage. The structure of the passages was exactly the same as in the voice comparison survey. Each passage featured the phrasal and syllabic structure described in the Voice Comparison Survey, such as in the example below:

First check to see if you can bypass any faulty network **hardware**. You should run a system file check and then **defrag**, which usually helps determine the source of the **lag**. Then try rebooting as the last **step**, if there are still issues with network **latency**.

Each passage featured 6 terms deemed by jargon dictionaries (Butterfield & Ngondi, 2016; Martin, 2015; Prytherch, 2005; Spiller, 2015) and literature on each of the professions (Berman et al, 2016; Bourquin et al, 2015; Castro et al, 2007; Chaudhry & Choo, 2001; Innes, 2007; Naismith & Stein, 1989; Roter, 2011) to be vocabulary items specifically relevant to these professions. This was confirmed by speakers on the basis of their own experience in these professions. Each participant

recorded multiple takes of all five passages both without uptalk and with uptalk on the IP boundary words. The full text of the passages from the uptalk survey is found in part B of the appendices

In order to keep the conditions of each narrative passage as similar as possible, the uptalk items (individual words featuring uptalk) were spliced into their corresponding positions in the non-uptalk passages, using the audio editing software Audacity. Therefore, the only difference between the non-uptalk and the uptalk passages was the presence of uptalk items at IP boundaries, reducing the risk of having listener participants' responses be influenced by any differences in the intonational contours surrounding the uptalk items. The uptalk items were edited to match both the amplitude and starting pitch of the same items in the non-uptalk passage, also using Audacity. The finishing pitch for the uptalk items was also adjusted as necessary in order to preserve the size of the natural uptalk movement produced by the speaker. Due to the stress patterns remaining the same for all words in both the uptalk and non-uptalk passages recorded by the speakers, no apparent rhythmic issues arose with splicing the individual uptalk words into the non-uptalk passages. However, as previously acknowledged, there was no objective check of naturalness conducted after the items were spliced, which would be a limitation of the current research. With the majority of the uptalk items, participants naturally produced uptalk reflective of the later rise alignment point (at or later than 80% of the duration of the token) that is perceived and produced in New Zealand English as a statement, rather than a question. In cases where the alignment point of the uptalk item did not reflect the later rise, the uptalk tokens were manipulated in Praat to have the rise alignment point occur at 80% of the way through the token.

3. Results

In the presentation of these results, all variables will be denoted using capital letters, e.g. Competence, Trustworthiness, Education Level, Gender, Age Group, and Uptalk. This distinguishes the variables used in the analysis from the concepts they represent.

3.1 Overview of analysis methods

The analysis of Competence and Trustworthiness data, consisting of listener participants' responses to a continuous numerical scale ranging from 0-100, was conducted via linear mixed effects regression models using *lmer* in the *lme4* package (Bates, Maechler, Bolker, & Walker, 2015) in R (R Core Team, 2014). The *mixed* function in the *afex* library (Singmann, Bolker, & Westfall, 2015) was used to assess the significance level of predictors, via model comparison using the Kenward-Roger's (KR) approximation. The KR method was used for model comparison over likelihood ratio tests and the Satterthwaite's method of approximation as it is less affected by sample size and the complexity of covariance structures, and provides slightly more conservative p-values than other methods (Schaalje, McBride, & Fellingham, 2002). Post-hoc analysis was conducted using least-squares means pairwise comparisons with Tukey p-value correction for multiple contrasts, using the *pairs* function from the *lsmeans* library (Lenth, 2016). The Voice Comparison Survey (VCS) was used to calculate average Competence and Trustworthiness scores for each voice used in the uptalk survey, and these averages were then subtracted from individual Competence and Trustworthiness scores in the uptalk survey to yield a 'difference from baseline' measurement, in order to take into account the differences between individual voice characteristics in the absence of uptalk.

As well as assessments of competence, trustworthiness, and education level, the uptalk survey also included a question in which listeners were asked to choose which profession they believed the speaker was representing, with the possible choices of Doctor, IT Support, Lawyer, Librarian, and Other. The purpose of including this question was to gauge whether listeners had the correct

profession in mind when making their assessments of Competence, Trustworthiness, and Education Level. Out of the 1280 total response sets for the uptalk survey, participants chose the incorrect profession for 32 response sets (2.5% of the data). These incorrect response sets were excluded from all three analysis categories. The highest percentage of incorrect profession responses was for the Librarian, with 16 incorrect response sets (1.25% of all data). The lowest percentage of incorrect profession responses was for the Doctor, with 3 incorrect responses sets (0.23% of all data).

For both the VCS and the uptalk survey, listener participants were asked to assess the education level of the speaker based on a categorical question with six possible options - Pre-high school, High school, Vocational degree, Bachelor's degree, Postgraduate qualification (Master's, PhD), and Other, which allowed listener participants to write in their perceived education level of the speaker. Out of the 640 total responses to the education level question on the VCS, 50 responses (7.8%) were from the Other category. Of these Other responses, 45 responses (7.03% of all data) were excluded from Education Level analysis because they did not provide any information that could be categorised into one of the five other education levels - such as one participant who informed the researcher that by writing 'PhD in awesomeness' as an Other option, the participant did not mean they believed the speaker actually possessed a PhD. Out of the 1280 total responses to the education level question in the uptalk survey, 38 responses (2.97%) were from the Other category, and of these, 15 responses (1.1% of all data) did not provide any information about education level, such as the participant comment 'It sounds like she isn't very sure of herself'. The remaining 23 responses (including comments such as 'medical licence' or 'legal executive') could be categorised into one of the five education levels provided by the survey, based on Careers NZ's (2018) education level recommendations for entry into various careers.

Analysis of Education Level data, consisting of listener participants' responses to a categorical education level question with six possible options (Pre-high school, High school, Vocational degree, Bachelor's degree, Postgraduate qualification (Master's, PhD), and Other, which allowed participants to write in a perceived education level), In order to fit each of the five education levels to an ordinal

regression model, each level was assigned a code between 1 and 5, according to the NZQA's ranking of qualifications (2016, p.5). The education options were assigned the following codes:

1 - *Pre-high school*

2 - *High school*

3 - *Vocational degree*

4 - *Bachelor's degree*

5 - *Postgraduate degree*

Model comparison was conducted using *anova*, using the ordered regression models created with *clmm* in the *ordinal* package (Christensen, 2015) in R (R Core Team, 2014). First, a full model was created containing a four-way interaction between profession, gender, age group, and condition, and then individual terms and interactions were dropped and compared with previous models using *anova* until significant model comparisons were found. This was effectively a way of manually implementing the *mixed* function that was used for the competence and trustworthiness data.

3.2 Voice Comparison Survey (VCS)

The purpose of the VCS was to determine whether any differences in ratings for competence, trustworthiness, and education level existed between the four different voices used in the main uptalk survey. It was decided that such baseline data for each voice would be best obtained using materials without uptalk, and without including the different profession categories. The four voices appearing in the VCS as voices A, B, C, and D (and coded as such in the results) represented different professions when they appeared in the uptalk survey, as indicated in Table ii below.

Table ii. Voice codes and their representation in the uptalk survey

Voice code in VCS	Profession represented in Uptalk survey
A	Doctor
B	IT support
C	Lawyer
D	Librarian

The VCS provided baseline data from these four voices in the absence of uptalk and profession categories, meaning that the influence of the presence (vs. absence) of uptalk and the differences between professions in the uptalk study could be considered independently of individual voice effects. In the VCS, all four voices delivered the same five passages (labelled 'Narrative' in the statistical models) with vocabulary corresponding to the Bank Teller profession. As explained in the literature review, this profession was chosen because it is a client-facing position involving regular communication of technical information and advice-giving to members of the public, and because it has previously been shown that the presence or absence of uptalk does not affect ratings of competence or employability for bank tellers (Gorelik, 2016). In the analysis, the variables of Competence and Trustworthiness were examined in mixed effects linear regression models. The predictors were the fixed effects of Voice (A , B, C, D), listener Gender (Male, Female), and listener Age Group, together with all possible interactions of these predictors.

Although the primary purpose of the VCS was to determine whether any simple effect of Voice existed for any of the three outcome variables, Gender and Age Group were included as predictors in order to test the strength of the effect of Voice when taking into account age- and gender-related differences between groups. The inclusion of Gender and Age Group as predictors is further justified based on the fact that Gender is a category that was not included in the 2016 study upon which this study is based (Wollum, 2016), and exploration of possible Age Group-based differences is a purpose

of the current study. The random effect structure included intercepts for Participant (i.e. individual listeners) and Narrative, by-Participants slopes for Voice and by-Narrative slopes for Voice. The random slope for Voice by Participants was included because it is possible that individual participants responded to the four different voices over the course of the experiment for reasons unrelated to the differences between each voice, and the random slope for Voice by Narrative was included because there could be features of the content in each Narrative that would cause variation unrelated to the differences between voices. The overall design of the model is therefore:

[outcome variable: Competence / Trustworthiness] ~ Voice * Gender * AgeGroup + (1 + Voice|Participant) + (1 + Voice | Narrative)

3.2a Competence

For Competence, there were no significant effects, although the simple effect of Voice approached significance at p=0.06. Based on mean Competence scores, listeners ranked the four voices from least to most competent as B (62.409) → C (64.545) → A (67.67) → D (70.054), a ranking that merits reporting as it was the same ranking reflected in assessments of overall Trustworthiness, to be explored in the subsequent section of the results. As the assessment tool for rating Competence was a continuous scale ranging from 0 (unskilled / novice) to 100 (highly skilled / expert), these means also indicate that participants overall considered all four voices to be above the midpoint of the competence scale.

3.2b Trustworthiness

For Trustworthiness, there was a significant interaction of Voice and Age Group (p=0.01), as well as significant simple effects for Voice (p=0.01) and for Age Group (p=0.01). Figure vi depicts the interaction of Voice and Age Group, showing the means for each group predicted by the mixed effects

model. The interaction arose because there were significant differences within the 60-72 age group between voices A and B (p=003), B and D (p<0.001), and voices C and D (p=0.03), but no significant differences between voices for the 18-30 age group. In addition, pairwise comparison tests showed significant differences between age groups for Voice A (p=0.02), Voice C (p=0.04), and Voice D (p=0.005), but not for Voice B. The Age Group effect emerged because the 60-72 age group rated all four voices higher for Trustworthiness compared with the 18-30 age group, with the largest difference between voices appearing for voice D. The overall rank order of voices from least to most trustworthy, based on averages from raw data, was B (56.184) → C (60.385) → A (72.097) → D (73.115). This order is the same as the non-significant pattern displayed for competence.

Figure vi. VCS - Effect of Voice and Age Group on perceptions of Trustworthiness
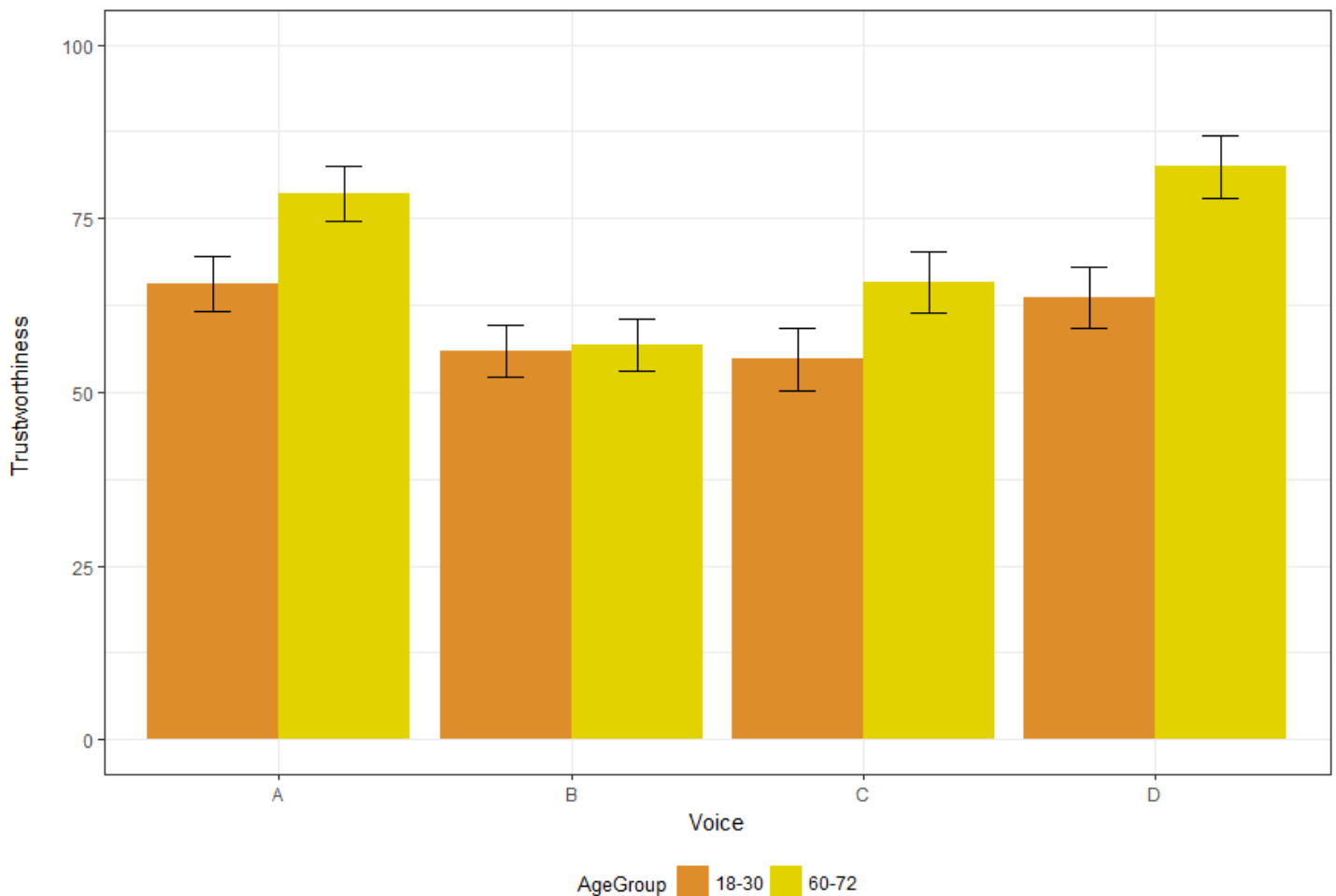
Based on these results, the two versions of the uptalk survey were designed so that voices A and B appeared in the uptalk condition in one version of the survey, and voices C and D appeared in the uptalk condition. This meant that participants did not hear the two voices assessed as least trustworthy and least competent in the absence of uptalk, or the two voices assessed as most trustworthy and most competent in the absence of uptalk, in the same condition.
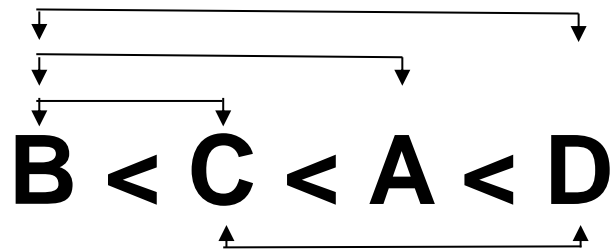
3.2c Education Level

Using *clmm* and *anova* model comparisons, the most effective model for VCS data included simple effects of Voice, Gender, and Age Group, an interaction of Gender and Age Group, and an interaction of Voice and Gender, with the random effect structure including intercepts for by-Participants slopes for Voice and a by-Narrative slope for Voice:

Education Code ~ Voice + Gender + Age Group + Gender: Age Group + Voice: Gender +

(1 + Voice|Participant) + (1|Narrative)

The output of this model showed a significant interaction between Voice and Gender (p=0.02) and a significant interaction between Gender and Age Group (p<0.01). Estimated marginal means comparisons revealed that there were no significant education level rating differences between voices for male listeners, but four significant differences between voices for female listeners, with a particularly strong influence of Voice B, which was ranked significantly lower than all three other voices by female listeners. The ranking of voices from lowest to highest education level for female listeners is shown below in Figure vii, with brackets indicating significant comparisons:

Figure vii. Education level rankings by voice (Female listeners only)

$$B < C < A < D$$

For female listeners, there were significant differences in Education Level ratings for voices A and B (p<0.01), voices B and C (p=0.04), voices B and D (p<0.01), and voices C and D (p<0.01). The frequency of education level responses per voice from female listeners, or the raw data described by the ranking in Figure vii, is shown in Figure viii below:

*Figure viii. VCS - Frequency of Education Level responses per Voice (Female)*
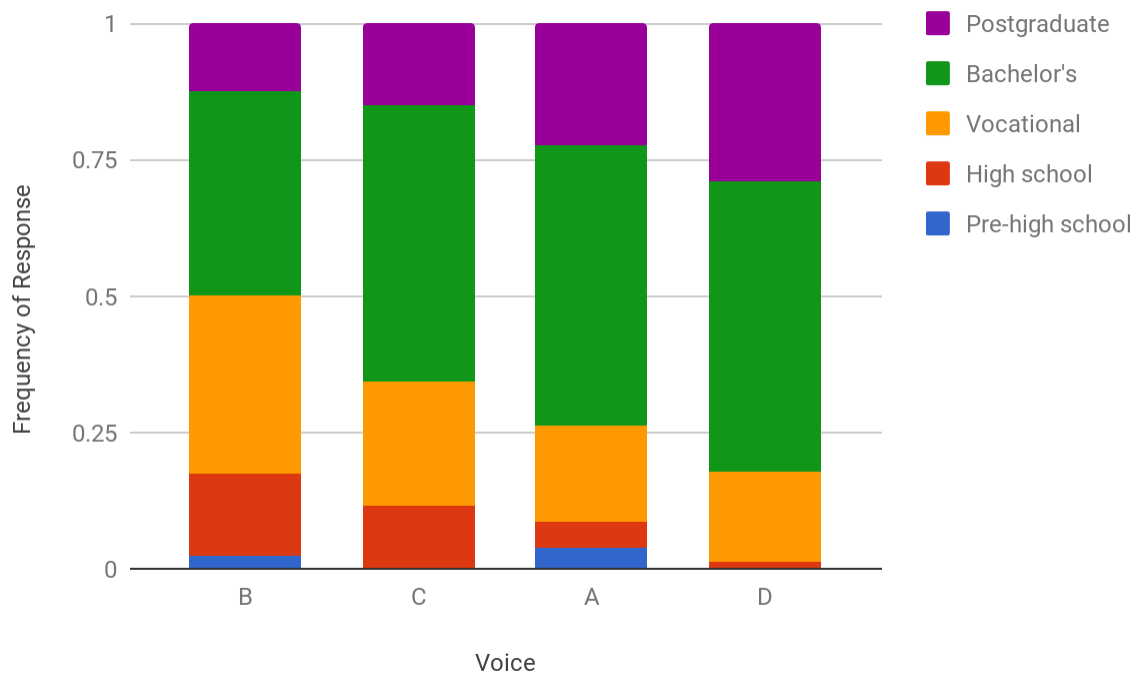
When broken down by education level rankings, Voice B received the highest proportion of Vocational degree responses, and while Voice A received a slightly higher proportion of Pre-high school

responses than Voice C, it also received a higher proportion of Postgraduate responses. Bachelor's made up the highest proportion of responses received for all four voices.

There was also a significant interaction between Gender and Age Group, with significant differences between both older listener groups and both male listener groups. Figure ix shows the demographics that gave the lowest through to the highest education level assessments:

Figure ix. VCS - Education Level ratings by demographic
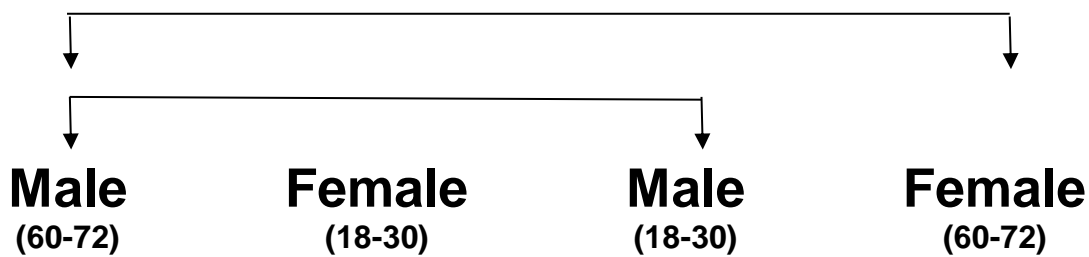
Female listeners in the 60-72 group provided significantly higher education level assessments than Male listeners in the 60-72 group (p<0.01), and Male listeners in the 18-30 group also provided significantly higher education level assessments than Male listeners in the 60-72 group (p=0.03). Figure x depicts the raw data described by Figure ix.

Figure x. VCS - Frequency of Education Level responses by Gender and Age Group listener demographic
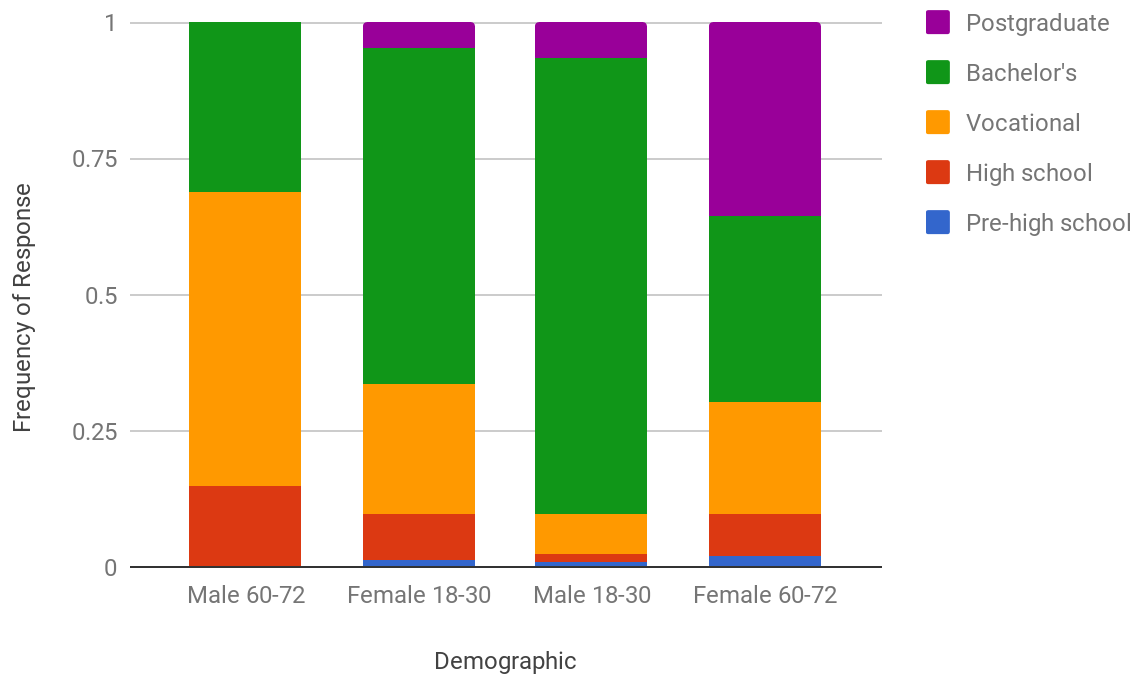
The older male listener group notably provided zero responses in the Postgraduate category, as well as being the only group in which the Vocational category made up the highest proportion of responses. In both of the younger listener groups, the Bachelor's category made up the highest proportion of responses, although younger male listeners provided a larger proportion of Bachelor's responses than younger female listeners. The older female listener group was the only group in which the highest proportion of responses received were for the Postgraduate category. This shows that the significant difference between older male listeners and older female listeners for education level came from the marked differences in the Vocational and Postgraduate response categories between the two genders.

3.2d Summary

The VCS was designed to test for any effects of the four voices used for the stimuli in the uptalk survey, for a single professional category and without including uptalk. There were no effects of Voice in the Competence category. For the Trustworthiness metric, there was a significant simple effect of

Voice as well as an interaction of Voice and Age Group with the 60-72 age group rating Voice A, C, and D as significantly more trustworthy than the 18-30 age group. For Education Level, there was a significant interaction effect between Voice and Gender, with female listeners rating Voice B significantly lower than the other three voices for education level. Also within the Education Level category, there was a significant interaction of Gender and Age Group, with Male listeners in the 60-72 group providing significantly lower education level ratings than both 18-30 Male listeners and 60-72 Female listeners. A Pearson's correlation test found a moderate positive correlation between the Competence and Trustworthiness variables (r=0.48). A Spearman's correlation test found a moderate positive correlation between Competence and Education Level (r=0.37), and a weak positive correlation between Trustworthiness and Education Level (r=0.15). Given that the VCS did not include any uptalk stimuli or any profession distinctions, this provides some interesting additional insight into age group, profession, and gender-related rating trends that emerged in the uptalk survey data, as well as common patterns between the three assessment categories in the uptalk survey, discussed in part B of the results.

The VCS was also conducted in order to yield baseline average ratings of competence and trustworthiness for each of the four voices used in the uptalk survey. For both the competence and trustworthiness assessment categories, averages from the raw data demonstrated the same pattern of ranking the four voices from least competent/trustworthy to most competent/trustworthy as B→ C→ A→ D. This motivated the decision to group voices A and B in the same condition, and voices C and D in the same condition in both versions of the uptalk survey.

3.3 Uptalk survey

The uptalk survey yielded 1280 responses, involving 64 participants answering 20 question sets, consisting of four Professions with 5 Narratives per profession. Participants heard two professions in the Uptalk condition and two professions in the Non-uptalk condition, although the set

of professions they heard in each condition depended on the survey version they received. In both versions of the survey, the Doctor and IT technician (voices A and B from the VCS) and the Lawyer and Librarian (voices C and D from the VCS) appeared in the same condition, motivated by the Competence and Trustworthiness rankings from the VCS, as well as the 2013 New Zealand Socio-economic index (Fahy, Lee, & Milne, 2017) in which doctors and lawyers are rated as having a higher socio-economic status than IT technicians and librarians. There were 320 responses for each of the four professions, covering 160 responses in the Uptalk condition and 160 responses in the Non-uptalk condition for each profession. As previously stated, incorrect profession guesses resulted in the exclusion of 2.5% of the data (32 responses).

In order to take into account the results of the VCS, which was designed to control for Voice, the average scores for Voice across all participants were subtracted from the scores in each category (Competence, Trustworthiness) for the uptalk survey. The decision was made to use average scores instead of model estimates because the same voices were used for the uptalk survey as for the VCS. As a result, all Uptalk survey responses represent a difference from the baseline for the Voice variable observed in the VCS. In the uptalk survey, Voice A represented the *Doctor*, Voice B represented the *IT Support Person*, Voice C represented the *Lawyer*, and Voice D represented the *Librarian*, with narratives for each voice that corresponded to each profession (see Appendix B). Although the VCS did reveal a significant interaction of Voice and Age Group interaction for the Trustworthiness variable (Figure iii), and significant interactions for Voice and Age Group (Figure iv) and Voice and Gender (Figure v) for the Education Level variable, these interactions were not taken into account for the Uptalk survey, in order to avoid cancelling out or obfuscating any effects of Age Group and Gender in the Uptalk survey. Table iii shows the average Competence and Trustworthiness scores for each voice from the VCS, and the professions that each voice represented in the Uptalk survey:

Table iii. VCS - Average Competence, Trustworthiness, and Education Level scores for each Voice

Voice code in VCS	Profession represented in Uptalk survey	Average Competence	Average Trustworthiness
A	Doctor	67.67	72.097
B	IT	62.409	56.184
C	Lawyer	64.545	60.385
D	Librarian	70.054	73.115

The uptalk survey also included two practice questions for listeners to become accustomed to the format of the survey. These two questions featured two of the passages from the VCS corresponding to the Bank Teller profession, delivered by a fifth voice in a mix of uptalked and non-uptalked phrases. Figure xi shows the average rankings for Competence and Trustworthiness for the four other professions in the non-uptalk condition, compared with the VCS (in which all passages were in the non-uptalk condition) and the Bank Teller practice passages in the uptalk survey (featuring some uptalked and some non-uptalk phrases).

Figure xi. Average Competence and Trustworthiness ratings for professions in the non-uptalk condition - comparing the VCS with the uptalk survey
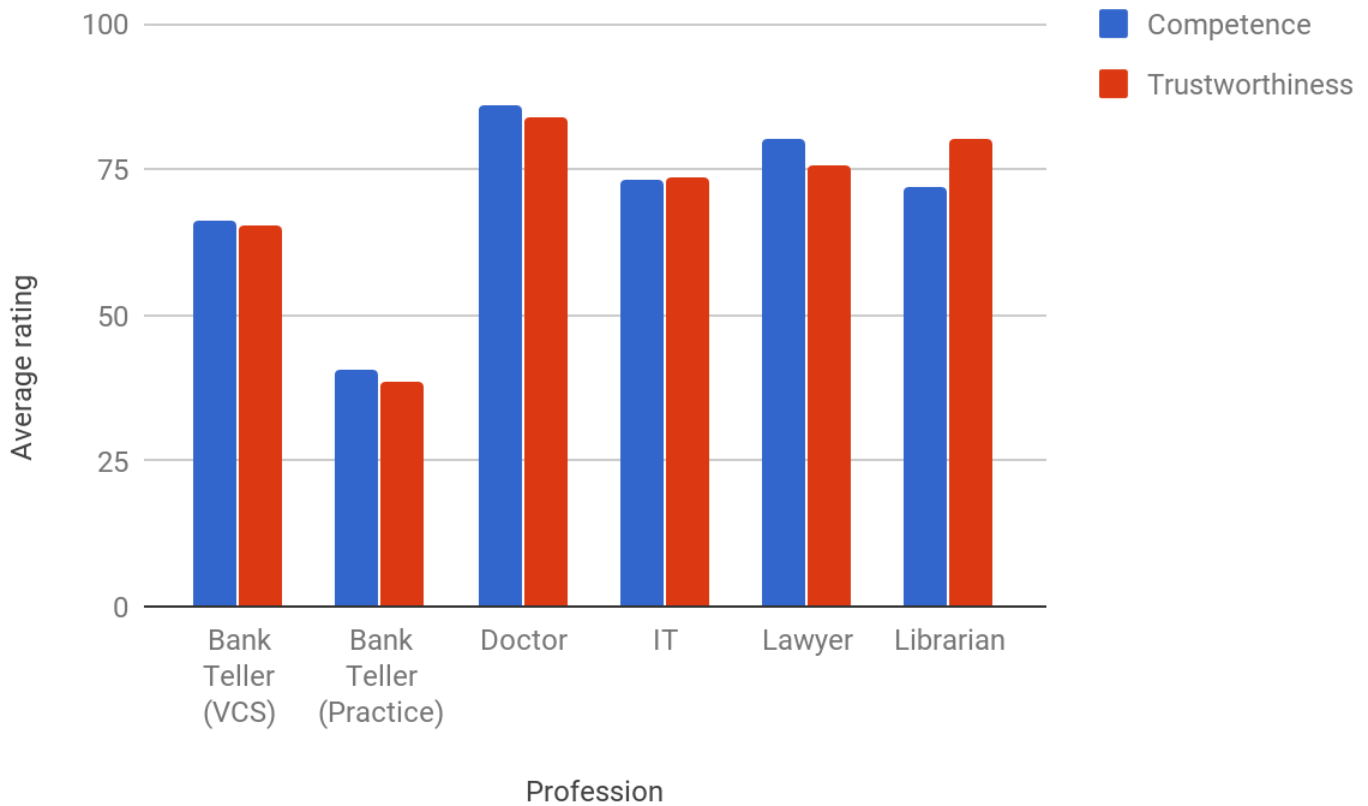

Figure xi shows that all professions featured in the uptalk survey, when in the the non-uptalk condition, were given higher average Competence and Trustworthiness ratings than the Bank Teller in the VCS, also in the non-uptalk condition. The reason for higher Competence and Trustworthiness ratings overall for the four professions featured in the uptalk survey may be due to the fact that all four speakers in the uptalk survey had previous experience in the four professions they represented, unlike in the VCS. In addition, listener participants in the uptalk survey never heard the same passage more than once, as opposed to the VCS, in which participants heard the same narrative passage spoken by all four voices. The substantially lower Competence and Trustworthiness averages for the Bank Teller (Practice) questions reflect the influence of uptalk, which had a significant effect on ratings of both Competence and Trustworthiness for particular age groups and professions, to be

discussed later in these results. Table iv shows the most frequent education level code for each profession:

Table iv. Most frequent education level codes for each profession

Profession	*Condition*	*Most frequent education level*	*Percent of responses for most frequent education level*
Bank Teller (VCS)	non-uptalk	Sub-postgraduate	87.39
Bank Teller (Practice)	some uptalk	Sub-postgraduate	97.5
Doctor	non-uptalk	Postgraduate	91.19
IT	non-uptalk	Sub-postgraduate	90.59
Lawyer	non-uptalk	Postgraduate	60.9
Librarian	non-uptalk	Sub-postgraduate	84.21

For the Doctor and Lawyer professions, more listener participants assessed the speakers as having a Postgraduate qualification than any other education level, when these professions were in the non-uptalk condition. However, for the Lawyer, Postgraduate qualification responses made up 60.9% of all responses, as opposed to the Doctor, where the Postgraduate qualification had much more of a majority with 91.19% of responses.

For the analysis of Competence and Trustworthiness (the numerical variables), the difference of the Competence and Trustworthiness scores from the VCS baseline were set as the outcome variables in mixed effects linear regression models. The predictors were the fixed effects of Profession (Doctor, IT, Lawyer, Librarian), listener Gender (Female, Male), listener Age Group (18-30, 60-72)

and Condition (Non-uptalk, Uptalk), together with all possible interactions of these predictors. The random effect structure included intercepts for Participant (listener) and Narrative, as well as by-Participant slopes for Profession and by-Narrative slopes for Profession. This is the same design as for the analysis of the VCS data, the exceptions being that the Voice predictor from the VCS models is represented in the uptalk model by Profession (each Profession corresponding to a different Voice, as explained above), and that the uptalk model adds the predictor variable of Condition. The overall design of the model is therefore:

[outcome variable: Competence / Trustworthiness] ~ Profession * Gender * AgeGroup * Condition +

(1 + Profession |Participant) + (1 + Profession |Narrative)

3.3a Competence

The inclusion of the uptalk condition and the use of different narrative texts for each voice, with the content corresponding to the different professions, resulted in a number of significant effects for Competence in the uptalk survey, unlike in the VCS, where no significant effects emerged. For Competence, significant simple effects were observed in the uptalk survey for Profession ($p < .001$), AgeGroup ($p<.001$), Condition ($p<.001$), the interaction of Gender and Age Group ($p = .007$), the interaction of Profession and Condition ($p<0.001$), the interaction of AgeGroup and Condition ($p<.001$), and the interaction of Profession, Age Group, and Condition ($p<.001$). Figure vii shows the most complex effect involving Profession, that of the interaction between Profession, Age Group, and Condition. The data in Figure xii are based on model predictions:

Figure xii. Uptalk survey - Effect of Profession, Age Group, and Condition on
Perceptions of Competence
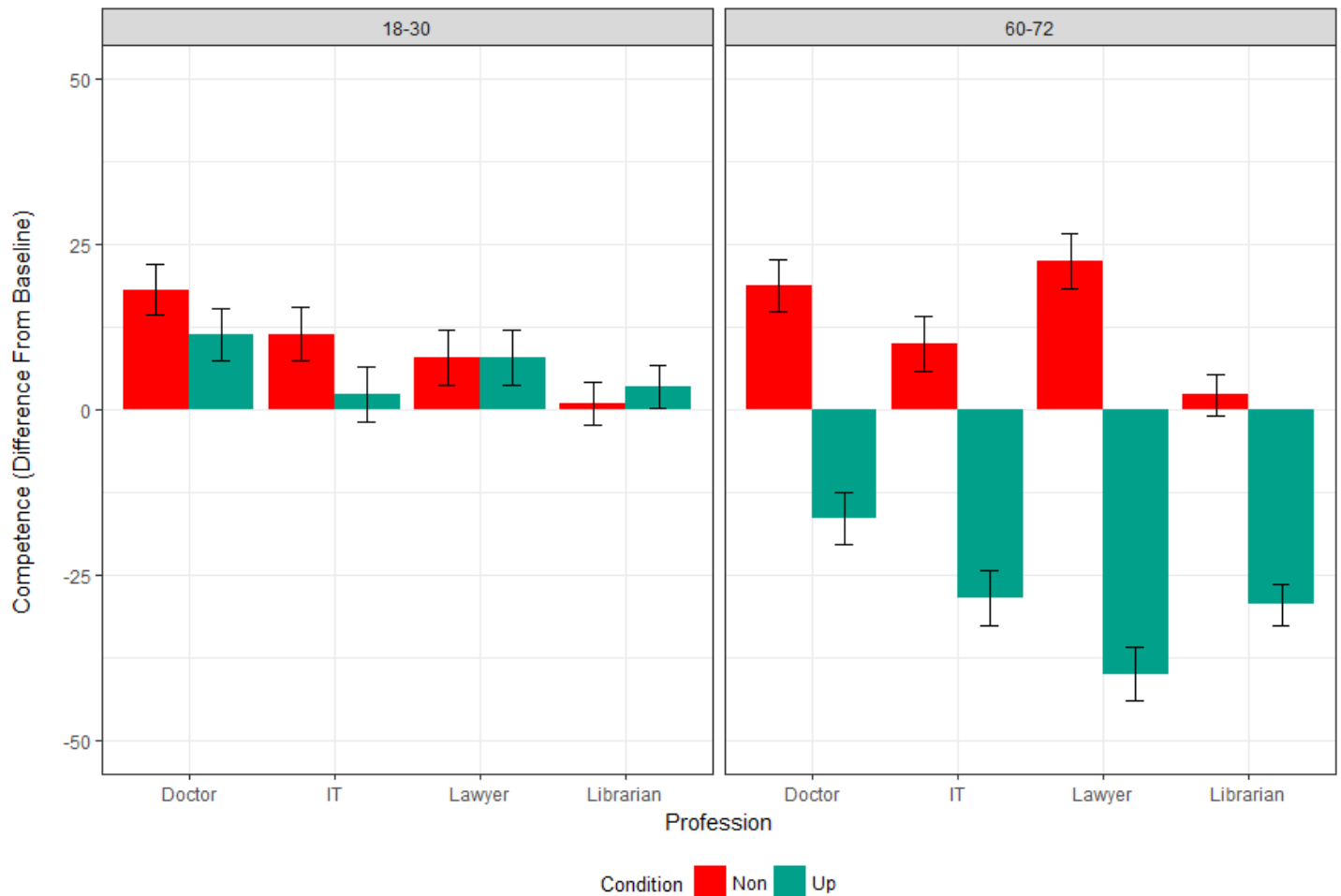
This significant interaction emerged primarily because of older listeners' tendency to rate all professions considerably lower for Competence in the Uptalk condition, with a particularly strong effect of this trend for the Lawyer profession. A pairwise comparison test showed that in the 18-30 age group there were no significant differences between professions based on Condition, whereas significant differences existed for all four professions (p<.01) between uptalk and non-uptalk conditions in the 60-72 age group. Competence ratings in the non-uptalk condition were higher than the baseline in the VCS for all four professions, within both age groups. In the 18-30 age group, Competence ratings were also higher than the baseline in the VCS for all four professions in both the Non and Uptalk conditions.

Figure xii demonstrates that for all four professions included in the current research, the presence of uptalk has a much stronger negative effect on perceptions of competence for older listeners. For younger listeners, two of the professions (Lawyer and Librarian) received higher ratings for Competence in the Uptalk condition compared with the Non condition, and the differences between Non and Up condition ratings were less than 10 points for each profession. This is in contrast with the older listener groups, in which the differences between Non and Up condition ratings exceeded 30 points for each profession.

Furthermore, some professions are more strongly affected than others by the presence of uptalk, although the order of professions most strongly affected by uptalk differed for each age group. For each age group, the order of professions from least to most competent changed based on the condition. In the Non condition, the younger listener group ranked the professions from least to most competent as Librarian → Lawyer → IT → Doctor , whereas in the Uptalk condition, the ranking of the professions for Competence increased from IT → Librarian → Lawyer → Doctor . Within the younger age group, the absolute size of the difference between Competence ratings for the Non and Uptalk conditions increased from Lawyer (.081) → Librarian (2.51) → Doctor (6.811) → IT (9.089). In the Non condition, the older listener age group ranked the professions from least to most competent as Librarian → IT → Doctor → Lawyer , whereas in the Uptalk condition, the ranking of the professions for competence increased from Lawyer → Librarian → IT → Doctor . Notably, in the older age group, the Lawyer was rated as being the most competent in the Non condition, but the least competent in the Uptalk condition. Within the older listener group, the absolute size of the difference between Competence ratings for the Non and Uptalk conditions increased from Librarian (31.709) → Doctor (35.159) → IT (38.356) → Lawyer (62.370). The most complex effect involving Gender, that of the interaction between Gender and Age Group, is shown in Figure xiii below.

Figure xiii. Uptalk survey - Effect of Gender and Age Group on Perceptions of Competence
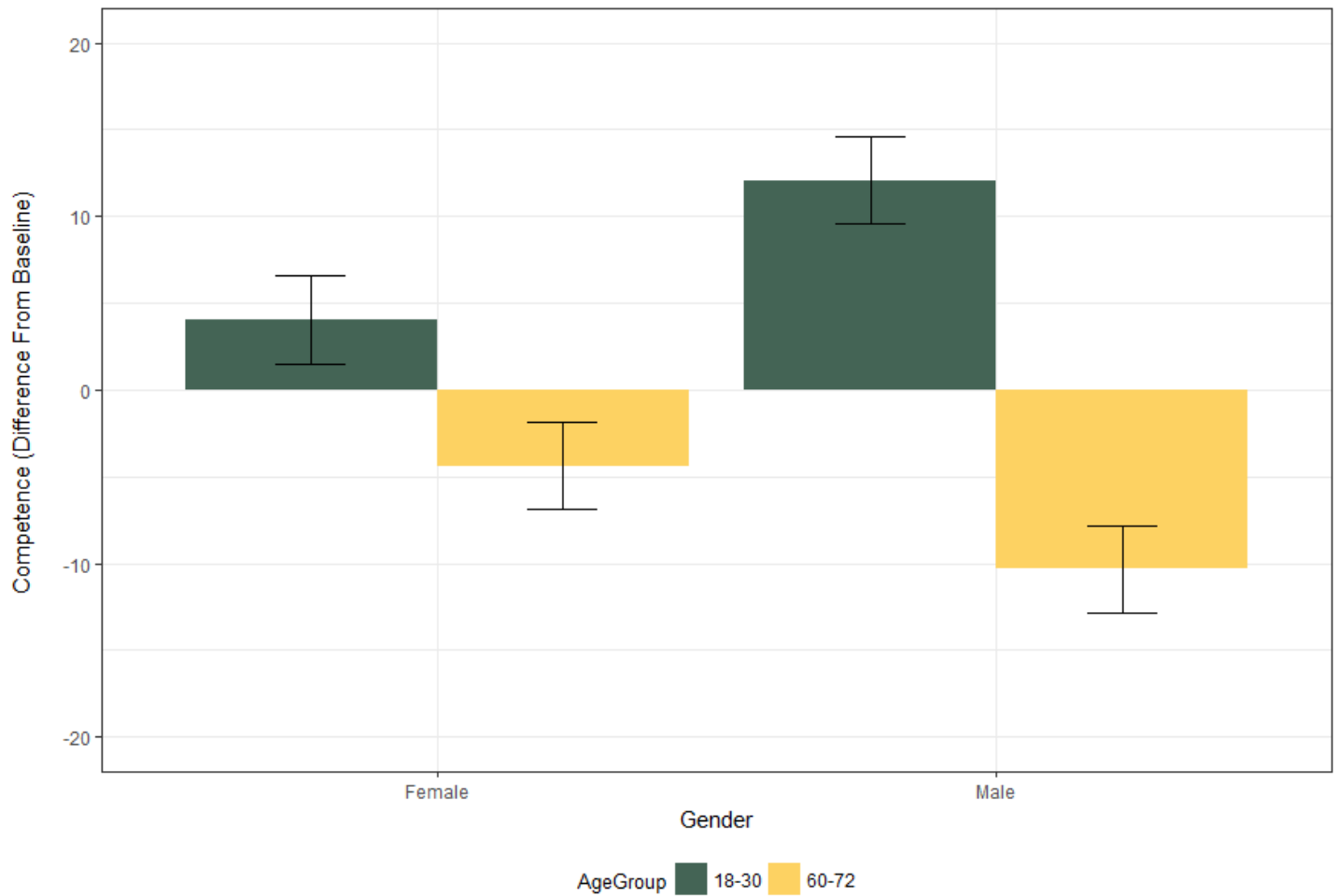
The effect of gender and age group emerged as a result of older listeners providing lower Competence rankings than younger listeners within both genders, and as a result of a particularly large gap between Competence ratings from Male listeners aged 18-30 and Male listeners aged 60-72. Both older listener groups provided Competence rankings that were below the VCS baseline, and both younger groups provided Competence rankings that were above the VCS baseline. A pairwise comparison test between the younger and older age groups indicated significant differences between age groups for both Female (p=0.02) and Male (p<0.001) listeners. A pairwise comparison test between Male and Female groups indicated a significant difference for the 18-30 age group (p=0.03) but no significant difference for the 60-72 age group, with 18-30 male listeners providing Competence

ratings that were significantly higher above the baseline compared with female listeners.The most variation occurred within the Male group, with male listeners aged 18-30 providing Competence rankings that were the highest above the baseline, and male listeners aged 60-72 providing Competence rankings that were the lowest below the baseline. The absolute size of the difference between younger and older age groups for Male listeners (22.484) was nearly three times the absolute size of the difference between the two age groups for Female listeners (8.524), which is notable given that all voices in the survey were female.

3.3b Trustworthiness

For Trustworthiness, significant effects were observed for Profession ($p<0.001$), Age Group ($p<0.001$), Condition ($p<0.001$), the interaction between Gender and Age Group ($p=0.01$), the interaction between Profession and Condition ($p=0.04$), the interaction between Age Group and Condition ($p<0.001$), and the interaction between Profession, Age Group, and Condition ($p<0.001$). These are the same significant effects observed for the Competence variable, although for Trustworthiness, the interaction between Gender and Age Group as well as the interaction between Profession and Condition emerge as less significant than for Competence. The most complex effect involving Profession, that of the Profession: Age Group: Condition interaction, is shown in Figure xiv:

Figure xiv. Uptalk survey - Effect of Profession, Age Group, and Condition on Perceptions of Trustworthiness
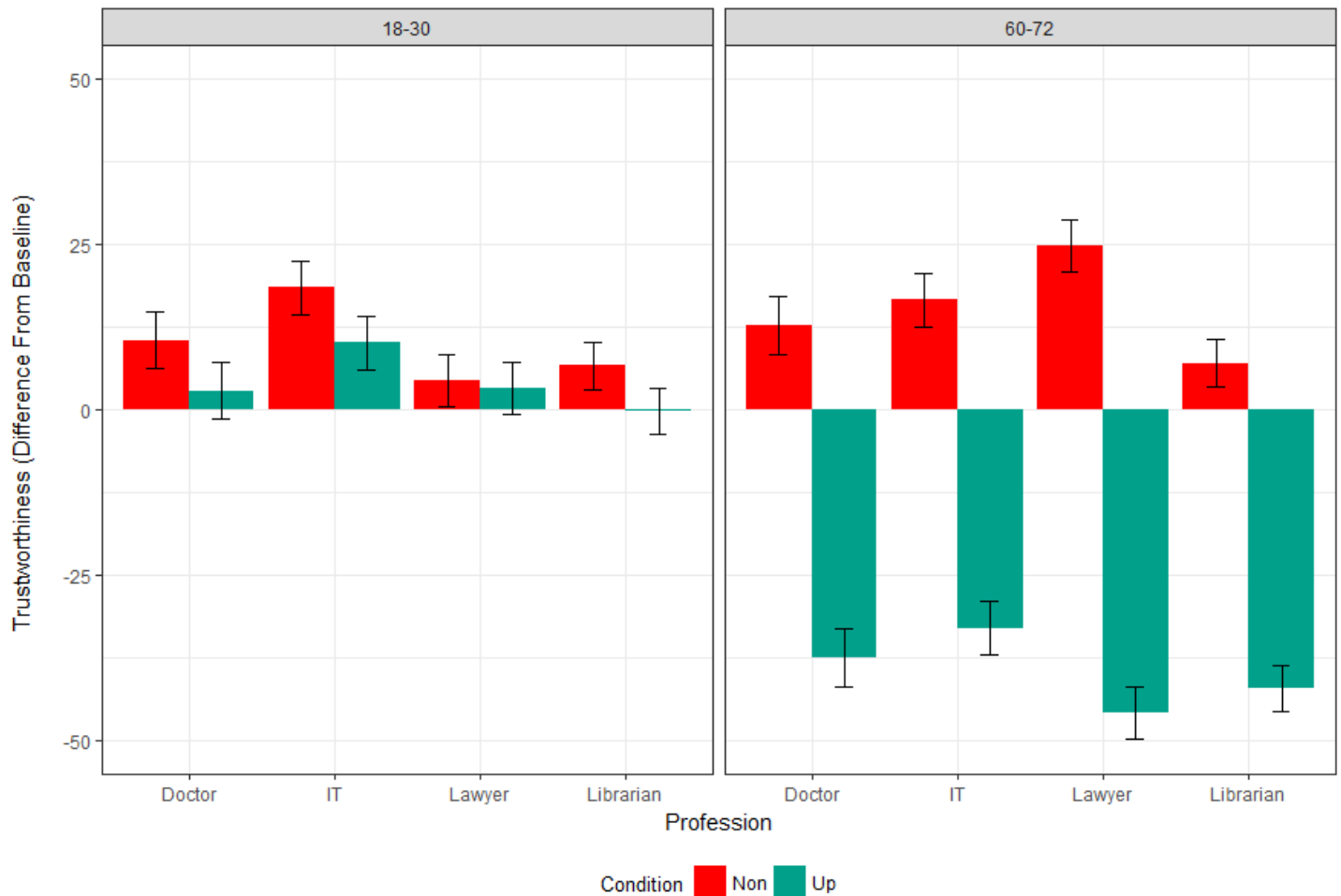
Similar patterns emerge for the Trustworthiness variable as for the Competence variable, with the 60-72 age group displaying a stronger negative perception of Trustworthiness in the Uptalk condition, with a particularly strong effect of this trend for the Lawyer. As with the Competence variable, Trustworthiness ratings in the Non-uptalk condition were higher than the baseline in the VCS for all four professions, within both age groups. However, the negative trend for the 60-72 age group is more extreme for the Trustworthiness variable in comparison with the Competence variable, with the absolute size of the differences between ratings increasing for all four professions. Although the 18-30 age group also rated all four professions with lower Trustworthiness scores in the Uptalk condition, a pairwise comparison showed no significant differences emerging between professions based on the Non vs Up conditions. The same pairwise comparison based on Non vs Up conditions

showed that significant differences existed between all four professions (p<0.001) for the 60-72 age group.

The Trustworthiness variable differs from the Competence variable in the way that the professions were ranked by each age group in each condition. In the Non condition, the 18-30 group ranked the professions from least to most trustworthy as Lawyer → Librarian → Doctor → IT, and in the Up condition, the ranking of the professions for trustworthiness changed to Librarian → Doctor → Lawyer → IT. The 60-72 group ranked the professions from least to most trustworthy in the Non condition as Librarian → Doctor → IT → Lawyer, but this ranking changed to Lawyer → Librarian → Doctor → IT in the Up condition. These rankings also differ from the rankings for Competence, demonstrating that uptalk carries a number of meanings and does not affect all perceptual variables in the same way. However, the absolute size of the difference between Trustworthiness ratings for the Non vs Uptalk conditions within the 18-30 group increased from Lawyer (1.142) → Librarian (6.821) → Doctor (7.677) → IT (8.334), the same ranking order as for the Competence variable. The absolute size of the difference between Trustworthiness ratings for the Non vs Uptalk conditions within the 60-72 group increased from Librarian → (49.149) → IT (49.548) → Doctor → (50.130) → Lawyer (70.653). As with Competence, the Librarian experienced the smallest effect in terms of size of difference, and the Lawyer experienced the largest effect in terms of size of difference, within the 60-72 age group. In addition, the differences between Non and Up ratings for the 60-72 group increased for Trustworthiness for all four professions, as shown in Table v:

Table v. Absolute size of rating differences between Non and Up conditions for

Competence and Trustworthiness within the 60-72 listener age group

Profession	Competence	Trustworthiness
Doctor	35.159	50.130
IT	38.356	49.548
Lawyer	62.370	70.653
Librarian	31.709	49.149

This shows that uptalk makes a bigger difference to perceptions of Trustworthiness than to

perceptions of Competence for older listeners, for the four skilled professions included in the current

research.

The Gender: Age Group interaction for Trustworthiness also featured similar patterns to the

Competence variable, as shown in Figure xv:

Figure xv. Uptalk survey - Effect of Gender and Age Group on Perceptions of Trustworthiness
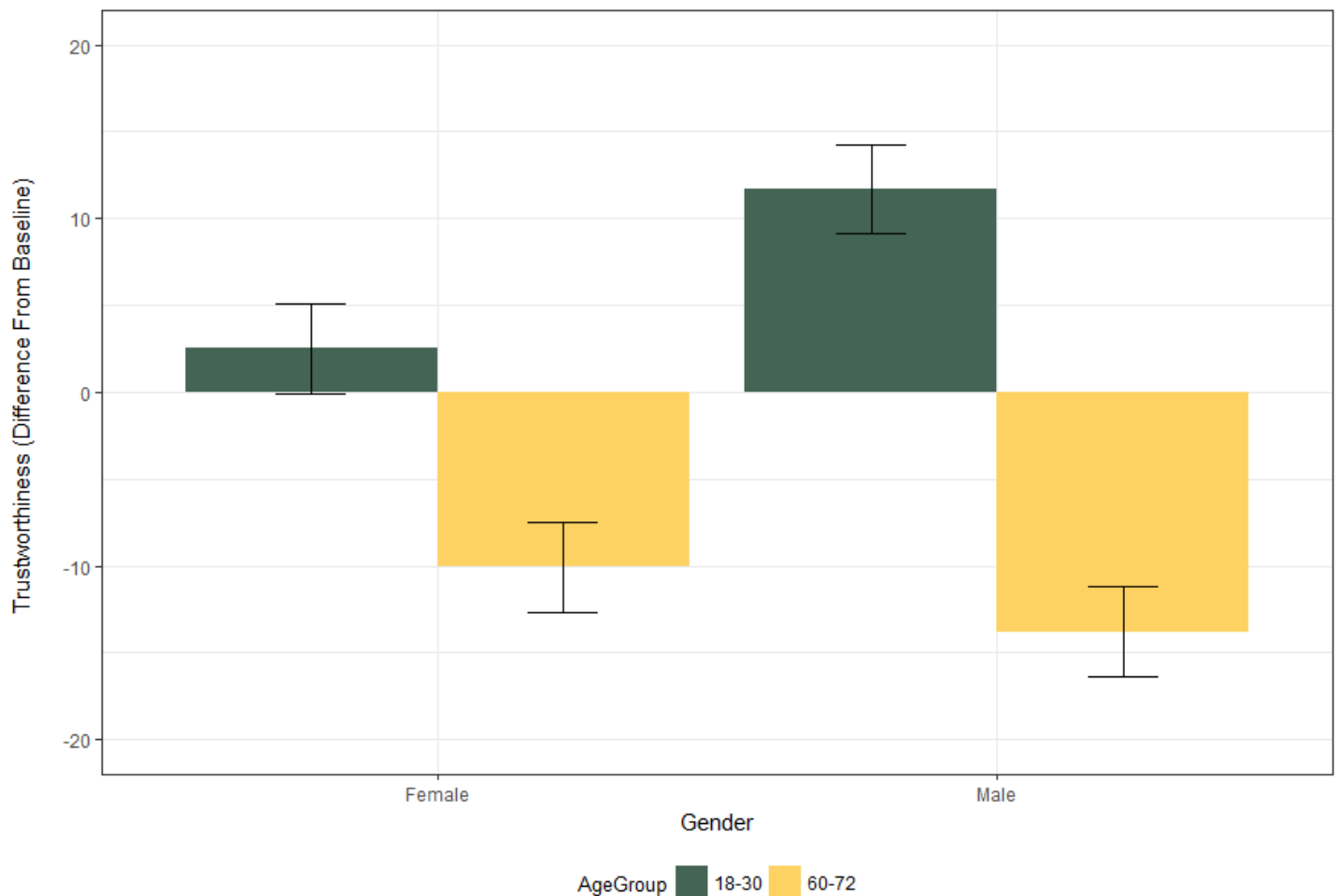
Both the Female and Male listeners in the 60-72 group provided lower Trustworthiness ratings than both genders in the 18-30 group, with both groups of older listeners providing ratings that were below the baseline, and both groups of younger listeners providing ratings that were above the baseline. A pairwise comparison between genders revealed a significant difference between 18-30 and 60-72 females ($p<0.001$) as well as males ($p<0.001$), and a pairwise comparison test between age groups revealed a significant difference between females and males aged 18-30 ($p=0.01$) but no significant difference between females and males aged 60-72. As with the Competence variable, the Male group displays a much larger variation of responses than the Female group, with an absolute size difference of 25.55 compared with the absolute size difference of 12.718 for the Female group. For both the Competence and Trustworthiness variables, Male listeners demonstrated the more

exaggerated version of the pattern within their age group, with 18-30 male listeners providing the highest ratings and 60-72 male listeners providing the lowest ratings for both Competence and Trustworthiness.

3.3c Education Level

Within the uptalk survey, Other responses accounted for 2.9% of the data in which the profession had been guessed correctly (37 responses), and out of these responses, 14 responses (1.1% of the data in which profession was guessed correctly) were excluded because they provided no further information on educational level, such as the participant comment 'It sounds like she isn't very sure of herself' (participant comments, some of which directly related to uptalk or to stereotypes surrounding uptalk, will be discussed in the Participant Comments section).

Using *clmm* and *anova* model comparisons, the most effective model for education level data from the uptalk survey included the following simple effects, two-way interactions, and three-way interactions, as well as random effects:

Education Code ~ Profession + Gender + AgeGroup + Condition + Profession:Gender +
    Profession:AgeGroup + Gender:AgeGroup + Profession:Condition + Gender:Condition +
    AgeGroup:Condition + Profession:Gender:Condition + Profession:AgeGroup:Condition +
    (1 + Profession | Participant) + (1 | Narrative))

The output of this model showed a significant simple effect of Profession ($p<0.001$) and a significant interaction between Gender and Age Group ($p<0.001$). Intriguingly, Condition had no significant simple effect, and was not involved in any significant interactions related to education level. Unlike in the VCS, where the effect of Voice emerged as significant only for Female listeners, the effect of Profession emerged as significant for all listeners. In addition, estimated marginal means comparisons showed that there were significant differences of $p<0.001$ between all four professions.

The ranking of professions from the lowest to highest education level code corresponded to IT < Librarian < Lawyer < Doctor. The raw data for this ranking is depicted in Figure xvi below.

*Figure xvi. Frequency of Education Level responses by Profession*
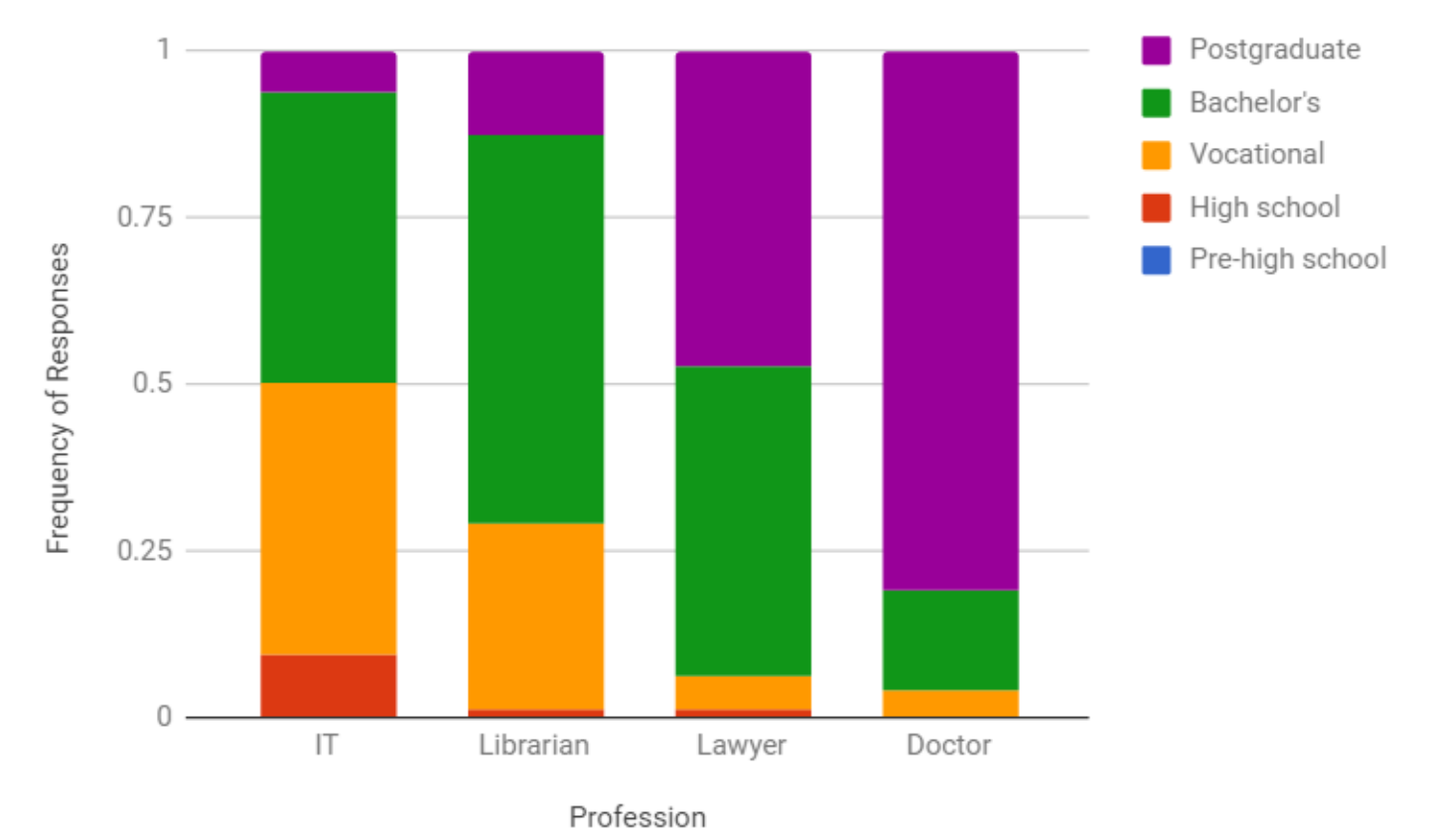
Similar to the VCS, the results of the uptalk survey showed a significant interaction of the effect between Age Group and Gender, with the rankings of education level by Age Group and Gender depicted in Figure xvii below.

Figure xvii. Education Level rankings by Age Group and Gender

There was a significant difference between the two age groups for male listeners groups (p=0.001), and a significant difference between the two genders for the younger listeners (p=0.01). Figure xviii below shows the raw data that yielded these results:

Figure xviii. Frequency of Education Level responses by Gender and Age Group listener demographic
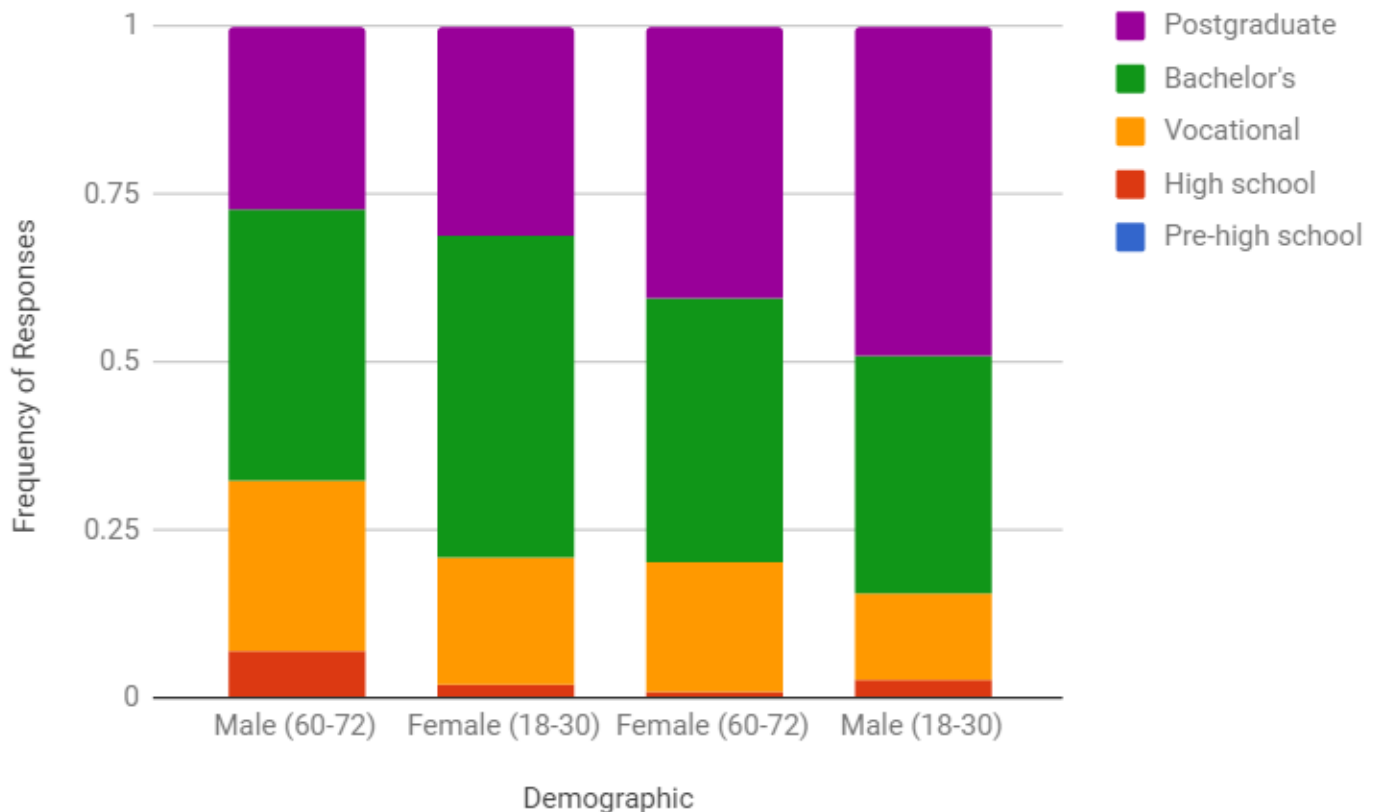
As with the VCS, the Male 60-72 listener group provided the lowest education level ratings, influenced by a higher proportion of High school responses and a lower proportion of Postgraduate responses than all other demographic groups. The significant difference between genders for the two younger age groups can be attributed to the larger proportion of Postgraduate responses for the Male 18-30 listeners and the larger proportion of Bachelor's responses for Female 18-30 listeners. The significant difference between age groups for male listeners can be attributed to the larger proportion of

Postgraduate responses from the Male 18-30 listeners, and the larger proportion of Vocational responses from the Male 60-72 listeners.

3.3d Participant Comments

Out of the 1280 responses received in the uptalk survey, 32 (2.5% of all responses) included further comments by participants as part of the 'Other' option included in the Education Level question. All 32 comments came from the 60-72 age group, and half of these related to the Lawyer in the Uptalk condition, which, as shown in Figures && and &&, was the profession most strongly affected by the presence of uptalk for both the Competence and Trustworthiness variables. Furthermore, 59% of comments (13 comments) came from Male listeners in the 60-72 age group, the listener group that consistently ranked uptalk users lower for Competence, Trustworthiness, and Education level. One participant commented specifically on the presence of uptalk, remarking that they found it 'very grating when the voice goes up at the end of the sentence', and that the 'voice going up at the end' made them believe the person was in some sort of career training rather than practicing any of the four profession options specified. Another participant commented that 'it sounds like she isn't very sure of herself' relating to the Doctor in the Uptalk condition, with lack of certainty being a listener perception that has previously been ascribed to the use of uptalk. 14 of the 16 comments for the Lawyer in the Uptalk condition stated that the Lawyer sounded like a 'secretary', 'paralegal', 'legal executive', or 'student', which would require a lower education level than being a practicing lawyer, and 7 of the 9 comments for the Doctor in the Uptalk condition stated that the speaker sounded like a 'nurse', 'support worker', or 'carer', which suggests a lower level of education as well as a possible connection for some listeners between uptalk, a predominantly female speech practice in New Zealand, and professions that are female-typed. Although they make up a very small proportion of the data, these comments are worth noting as they support the quantitative data showing that older listeners are much more likely to both observe and more likely to negatively perceive the presence of uptalk.

3.3e Summary

In the uptalk survey, some recurring interactions emerged for Competence, Trustworthiness and Education Level. The Gender * Age Group interaction emerged as significant for all three variables, and the Profession * Age Group * Condition interaction emerged as significant for the Competence and Trustworthiness variables. Table v below shows these recurring interactions.

Table v. Recurring interactional effects

Outcome Variable	Significance of Profession * Age Group * Condition interaction	Significance of Gender * Age Group interaction
Competence	p<0.001	p=0.007
Trustworthiness	p<0.001	p=0.01
Education Level	Not significant	p<0.001

For both the Competence and Trustworthiness variables, the significance of the interaction between Profession, Age Group, and Condition emerged as a result of the 60-72 listener age group rating all four professions lower than the 18-30 listener age group, with the Lawyer profession most significantly affected. For the older listener group, the Lawyer was rated as both the most competent and the most trustworthy profession in the Non-uptalk condition, and the least competent and least trustworthy in the Uptalk condition. The comments provided by participants, all of which were from the 60-72 listener age group and half of which related to the Lawyer in the Uptalk condition, support the data showing that the Lawyer was most significantly affected by the use of uptalk, specifically for the 60-72 listener age group. For the 18-30 listener age group, there were no significant differences between professions for either competence or trustworthiness when comparing Uptalk and Non-

uptalk conditions. The age-based differences revealed in the current study indicate that the results of the study conducted in 2016 were indicative of a larger trend regarding how older listeners perceive uptalk differently to younger listeners. According to these results, older listeners are more likely to take note of uptalk and to perceive uptalk as more negative in general, and to perceive the use of uptalk as particularly detrimental when used by a lawyer.

The Gender and Age Group effect emerged for the Competence and Trustworthiness variables as a result of the two older listener age groups providing significantly lower ratings than the two younger age groups, and the 18-30 Male listener group in particular providing significantly higher ratings than all other listener demographic groups. For the Education Level variable, the Gender and Age Group effect emerged as a result of 18-30 Male listeners providing significantly higher ratings than both 18-30 Female listeners and 60-72 Male listeners. In the 2016 study, which involved only female listeners, this gender effect was not explored. Given that the speakers used in the uptalk survey were all females from the 18-30 age group, the consistently higher ratings from 18-30 Male listeners reveal an interesting combination of in-group and out-group effects, which will be explored further in the discussion section in part D of this paper.

Given the similar patterns that emerged for Competence and Trustworthiness, a Pearson's correlation test was conducted for these two assessment categories. The Pearson's method revealed a very strong positive correlation (r=0.85) between the two categories, a much stronger correlation than the moderate positive correlation from the VCS (r=0.48). This stronger correlation indicates that the addition of the uptalk condition and of professional category distinctions in the uptalk survey also strengthened the associations listeners had between competence and trustworthiness.

4. Discussion

The results of the current research will be discussed in the context of the four questions outlined in the literature review as the purpose of the current research. The results provide the following answers:

4.1. Do the age-based differences revealed in the previous study (Wollum, 2016), in which older listeners rated uptalkers as both significantly less competent and significantly less trustworthy than non-uptalkers, hold for a wider range of highly-skilled professions?

The results of the current research prove that the age-based perception differences revealed in the previous study (Wollum, 2016) are significant across a wider range of highly-skilled professions, representing a trend of older listeners perceiving highly-skilled professionals to be significantly less competent and significantly less trustworthy when using uptalk, and younger listeners perceiving no significant competency or trustworthiness differences in uptalkers versus non-uptalkers. Given that all of the speakers used in the study were from the same age range as the younger listener group (aged 18-28), the age group-related findings from both this study and my previous work (Wollum, 2016) are in concordance with the 'out-group' vs 'in-group' (Warren, 2016, p.49) effect. This effect, as outlined by House (2006) and Warren (2016), is a dichotomy that occurs when two participants in a discourse perceive the same intonational contour to have different meanings based on differences in their intonational inventories, for example uptalk as a negative cue signalling uncertainty or a positive cue signalling inclusivity. House (2006) uses age-based perception differences of uptalk as an example of how the same intonational contour can be interpreted differently depending on whether the listener is oriented towards the grammatical content or the discourse content of the message. She details how orientation to the linguistic content of uptalk is more likely to result in a negative interpretation of insecurity or uncertainty, whereas orientation to the discourse function of uptalk is more likely to result in a positive interpretation of openness or establishment of common ground with the listener (House, 2006: 1554). Both House (2006) and Warren (2016: 49) explain that, given their

intonational inventories, older listeners in the out-group are more likely to be oriented towards the linguistic content of uptalk rather than its discourse function, resulting in confusion over the actual intention of the speaker. The effect of age group in the current study is in keeping with these age-based out-group effects, showing that uptalk does signify different meanings to different age groups. For the younger listener group, the presence of uptalk appears to have no salience as an indicator of either competence or trustworthiness, due to the lack of significant differences between the uptalk and non-uptalk conditions within this listener demographic. This is a similar finding to my previous work (Wollum, 2016), and invites further research into whether the presence of uptalk is a significant indicator for younger listeners of other speaker attributes that were not explored in this study, for example the friendliness of the speaker. By contrast, uptalk use is clearly a significant indicator of a lack of competence and trustworthiness (or in the case of the current study, incompetence and untrustworthiness) for older listeners. It is intriguing that uptalk still appears to be perceived by older listeners as a marker of youth speech contrastive to their own, given that uptalk is not a recent phenomenon in NZE. Uptalk became a recognised and prevalent feature of NZE by 1980 (Bauer, 1994), so the older listener group in this study would have had over 40 years of experience hearing uptalk regularly. It is unusual that uptalk has remained cemented as a marker of youth speech despite generational change, and suggests that uptalk may continue to be perceived as a marker of youth well into the future.

4.2. Does the presence of uptalk affect listener perceptions of a speaker's education level?

This research indicates that the presence of uptalk does not significantly affect listener perceptions of a speaker's education level. This corresponds with Steele's (1995) findings that the presence or absence of uptalk makes no significant difference to the level of education deemed by listeners to be appropriate for a speaker. Instead, it was speaker profession, as well as the interaction between listener gender and age group, which had an effect on the perceived education level of the speaker. The ranking of the professions from lowest to highest education level score, that is from IT <

Librarian < Lawyer < Doctor, reflects Careers NZ (2018) advice that it is possible to become an IT professional or a librarian without a postgraduate qualification, but impossible to become a lawyer or doctor without one. The effect of profession is particularly evident when comparing the results for the VCS (Figure v) and the uptalk survey (Figure xii), which show a dramatic increase in the number of postgraduate qualification responses for both the doctor and lawyer when professions are included.

4.3. Does the gender of the listener influence or interact with the effects of uptalk on the perceived trustworthiness, competence, and education level of a speaker?

For all three metrics, the gender of the listener did not interact with the effects of uptalk, and there were also no simple effects of listener gender for any of the three metrics. However, for all three metrics in the uptalk survey, as well as for education level in the VCS, a significant interaction between the listener's gender and age group emerged. An in-group and out-group effect was present in regards to age group, with the two younger listener groups providing significantly higher ratings for competency and trustworthiness than their corresponding older listener group. If the gender and age group interaction had patterned neatly along in-group and out-group lines, it would be predicted that the younger female listeners would provide the highest ratings as they were the closest to the age and gender peer group of the speakers, and that older male listeners would provide the lowest ratings as they were the furthest removed from the age and gender peer group of the speakers. However, this was not the case, as influenced by the unexpected pattern of younger male listeners providing the highest ratings. In the uptalk survey, younger male listeners provided significantly higher ratings for both competence and trustworthiness than all other demographic groups, and provided significantly higher rankings for education level compared with the younger female and older male listener groups. Furthermore, the older male listener group provided significantly lower ratings for competence than all other demographic groups, and provided significantly lower ratings than the younger male listener group for all measured variables. Given that the gender and age group effect existed independently of any influence of uptalk, the results suggest that some other quality of the speakers' voices may have influenced ratings. Previous studies have shown that female voice pitch influences perceptions of

qualities such as dominance, suitability for leadership positions, and trustworthiness (Jones et al, 2010; Klofstead et al, 2012; O'Connor & Barclay, 2017). All three of these studies show a marked preference for lower-pitched female voices for positions of power or authority. Jones et al (2010) found that while male listeners found higher-pitched female voices more attractive, lower-pitched female voices were deemed to be more dominant, while Klofstead et al (2012) found that both male and female listeners were likely to rate lower-pitched female voices as more suitable for an elected leadership position, and O'Connor & Barclay (2017) found that lower-pitched female voices are perceived as more trustworthy in general. Childers & Wu (1991) state that 220Hz is the average pitch for the female voice, and pitch tracking data from Praat showed that all four speakers in the uptalk survey had speaking voices that remained predominantly below this 220Hz average pitch. In previous studies of voice pitch and its relationships to various qualities, participants have primarily been from younger age groups, although the results of the current research suggest that more investigation is warranted into how voice pitch influences different age groups' perceptions of particular qualities of the speaker. Moreover, the results of this study indicate that the previously-established general perception of lower-pitched women's voices as possessing of qualities such as trustworthiness and leadership competence among younger listeners, could be particularly influenced by the perceptions of young male listeners.

4.4. Does the profession of the speaker influence or interact with the effects of uptalk regarding how listeners perceive their competence, trustworthiness, and education level? That is, might some professionals be perceived as more competent, more trustworthy, and more highly educated when using uptalk, and some perceived as less competent, less trustworthy, and less highly educated?

The interaction between Profession and Condition emerged as significant for both competence ($p<0.001$) and trustworthiness ($p=0.04$), but not for education level, and more specifically, the interaction between Profession, Age Group, and Condition emerged as significant for ratings of competence and trustworthiness. This is due to ratings from the older listener group in the uptalk

condition, particularly for the lawyer. All professions, especially the lawyer, were given significantly lower ratings by the older group in the uptalk condition than in the non-uptalk condition, and significantly lower ratings compared with younger listeners in the uptalk condition.

Considering that all participants had no experience in any of the four professions included in the uptalk survey, the in group / out group dichotomy is not a relevant framework to consider for the aspect of profession, as all participants would be considered members of the out group. Instead, it is useful to examine gender-based stereotypes regarding the four professions included in the uptalk survey, and how they interact with stereotypes about young women. Young women are the demographic that all five speakers in the study belonged to, the demographic that most commonly uses uptalk in NZE (Bell, 2000; Warren & Britain, 2000), and the demographic that tends to be most policed for uptalk use in the media (Cameron, 2015 , p. 16; Grose, 2015, p. 4; Warren, 2016, p.148). Although uptalk certainly does occur in male speech in New Zealand (Britain, 1992), it is not perceived primarily as a male communication characteristic. In the current research, the strongest negative effects of uptalk for older listeners occurred in professions that have been historically male-typed, and where stereotypically masculine behaviour results in an increased recognition of professionalism in contrast with stereotypically feminine behaviour.

In reference to medical professions, both Trotter (2017) and Huppatz (2009) use the term "double-edged sword" to describe women practicing communication styles associated with their gender. Historically, becoming a doctor has been considered a more fitting medical occupation for men, while nursing and other forms of care work have been female-dominated, to the extent that nursing has previously been considered as an unacceptable occupation for men (Huppatz, 2009, p.53). This means that using female-coded speech elements, such as uptalk, could result in women being considered less suitable for a historically male-coded profession, like being a doctor. This pattern was true of both competence and trustworthiness ratings for older listeners, who rated the doctor significantly lower in the uptalk condition than in the non-uptalk condition. In addition, all but one of the participant comments provided for the doctor passages came from older listeners in the

uptalk condition, with the majority of comments suggesting that the speaker was a nurse, carer, or health support worker.

Real-world data shows that female lawyers now outnumber male lawyers in NZ (Dolor, 2018) and that the number of female lawyers is increasing more rapidly than the number of male lawyers (Bolton & Muzio, 2007, p.48). However, despite evidence that women are already in the majority in this profession, Bolton & Muzio note that key figures in the establishment and maintenance of the legal profession continue to forge professional practice around a 'masculine code' (2007, p.53), with women symbolically judged as lacking the aggressive qualities required for profitable legal practice' (2007, p.53). The Law Council of Australia's National Attrition and Re-Engagement Study concluded that women lawyers face a 'very high level of discrimination and harassment at work' (Law Council of Australia, 2014, p.6), with a number of participants in the study indicating that clients particularly requested not to work with young female lawyers due to lack of confidence in their services. In a speech delivered to the Victoria University Law Students' Society in 2010 on gender inequality in New Zealand's legal profession, Justice Susan Glazebrook stated that acting in a 'feminine' manner as a lawyer is 'associated with incompetence, while masculine traits are associated with competence' (Glazebrook, 2010, p.8), and Sommerland & Sanderson similarly observe that 'token women who take on the male characteristics…succeed in reaching the top' (Sommerlad & Sanderson, 1997, p.60). Furthermore, the New Zealand legal profession has recently been under scrutiny for providing an unsafe environment for young women, with leading lawyers calling for a specialised sexual harassment officer to be employed by the New Zealand Law Association (Roy, 2018). If listeners hold these stereotypes about the legal profession, then the presence of uptalk, a communication style associated with young women that has previously been attributed meanings of subordination, deference, and uncertainty (Warren, 2016, p.51), would certainly exaggerate negative perceptions of competence and trustworthiness. Older listeners rated lawyers as the both the most competent and the most trustworthy of the four professions in the non-uptalk condition, and the least competent and least trustworthy of the four professions in the uptalk condition, suggesting that these stereotypes

about the legal profession as a male-coded workplace are more relevant to 60- to 72-year-old listeners than to 18- to 30-year-old listeners.

By contrast to the lawyer, the librarian was the least affected by the presence of uptalk for older listeners, although the librarian was assessed as significantly less competent than both the lawyer and the doctor in the non-uptalk condition, and significantly less trustworthy than the lawyer in the non-uptalk condition. Also in contrast to the lawyer, librarianship has historically been female-typed, to the point where it has been dismissed as one of the 'feminised semiprofessions' (Simpson & Simpson, 1969, p.4). Librarianship has been dominated by women since the 1930s (Beveridge, Weber, & Beveridge, 2011), and has been experiencing a decline in the number of men involved in the profession since 1975 (Williams, 1992). A survey of male librarians and male library students conducted by Morrissey & Case (1988) indicated that male librarians believed the public's image of themselves to be more 'submissive, meek, nervous, effeminate, reserved, following, subdued' (Morrissey & Case, 1988, p.453), many of which are qualities that have previously been ascribed to uptalk. The presence of uptalk, which as previously discussed, is considered to be more indicative of female than male speech, may be more accepted and less confronting to older listeners in a profession that is viewed as feminised. Carmichael (1992) observes that, despite the majority of librarians holding postgraduate qualifications, the 'feminine image has been blamed repeatedly for the low occupational prestige of librarianship' (p.415), which could explain why the librarian was rated as significantly less competent and significantly less trustworthy than the male-typed professions in the non-uptalk condition. The results of this study suggest that librarians are the least affected by stereotypical feminine speech characteristics because librarianship is a stereotypically feminine profession, although they are still affected by stereotypes of feminine professions as being lower in prestige.

4.5 Future research directions

The similar patterning of the competence and trustworthiness results, and the strong correlation between the two (r=0.85), indicates that these two categories are strongly connected for listeners in terms of assessment of uptalk. This is evidence either of a larger pattern of negative perceptions of uptalk for older listeners across a variety of personal qualities, or evidence that the competence and trustworthiness categories are essentially providing the same information. In either case, future research could explore other perception metrics for uptalk, such as friendliness, politeness, deference, or inclusivity. The decision was made in the current research to explore competence, trustworthiness, and education level because it was predicted that all three would trend in the same direction for older listeners and have little effect for younger listeners, a hypothesis that was proven correct for competence and trustworthiness. In addition, all five professions involved in the current study will benefit from perceptions of increased competence, increased trustworthiness, and different education level. However, including an assessment metric for a quality like friendliness, inclusivity, or openness would test claims that these are the qualities of uptalk that are most readily interpreted by younger listeners (House, 2006: 1554). Testing for friendliness, inclusivity, or openness might also result in different significant effects for each profession, as a quality like friendliness is arguably more important for a librarian than it is for a lawyer.

The four professions included in the uptalk survey were included because they are all high-status professions requiring specialised education and training, as well as providing advice to members of the public on a regular basis. These high-status professions were included specifically because the use of uptalk has previously been attributed to lower-status professions, and one aim of the current research was to investigate whether listeners rated higher-status professional speakers more negatively when they used a lower-status speech style. In future research, it would be prudent to include lower-status professions as well as higher-status professions, not to mention historically male-typed and historically female-typed professions.

The design of the current study sought one, static rating from listeners, after they listened to each item once. However, previous research by Watson & Clark (2015) has demonstrated that it is possible to explore real-time reactions to linguistic variation; although their research was on reactions to five different accent varieties, the same methodology could be applied to research on an intonational variable such as uptalk. In future research, it would be worthwhile to determine whether the occurrence of uptalk coincided with the timing of listeners' decisions on the competence, trustworthiness, and education level of speakers, and in what ways the timing of their decisions related to other demographic factors proven by the current research to influence listener perception of uptalk. Given that multiple instances of uptalk occurred in each passage, this sort of real-time reaction information would also show whether decisions about the competence, trustworthiness, and education level of speakers were made at the first occurrence of uptalk or after hearing later occurrences, and whether listeners adjusted their opinions over time. Data like these would provide further clues as to how uptalk is processed and perceived by individual speakers.

Furthermore, while the current research shows that perceptions of uptalk are clearly different for people in the 18-30 age group and people in the 60-72 age group, it would be worthwhile to explore the perceptions of other age groups in order to determine whether a change in perception is definitively occurring. As discussed in the literature review, uptalk has been observed in New Zealand English since the mid-20th century, and therefore hearing uptalk would not be a particularly new phenomenon for those currently in the 60-72 age group in New Zealand. Surveying listeners in the 30-60 age group would yield further data about how abruptly or gradually an individual's perception of uptalk might change over time.

5. Conclusions

The current study shows that the presence of uptalk negatively affected older listeners' perceptions of the competence and trustworthiness of speakers in highly skilled professions, and that the degree to which uptalk affected negative perceptions among older listeners was dependent on the profession the listener believed the speaker to be in. Specifically, the speaker portraying the lawyer experienced the most extreme decrease in competence and trustworthiness ratings among older listeners when using uptalk. The presence of uptalk did not significantly affect younger listeners' perceptions of competence and trustworthiness across any of the professions, and the presence of uptalk did not affect perceptions of the speakers' education level among either older or younger listeners. Listeners' perceptions of the education level of speakers were dependent on what profession they believed the speaker to be in, with the speaker portraying the doctor perceived as having the highest education level, followed by the lawyer, the librarian, and the IT professional. The gender of the listener did not influence how they perceived uptalk, however the gender and age group of the listener did influence their perceptions of speakers across both the non-uptalk and uptalk conditions, with younger male listeners providing significantly higher ratings of competence, trustworthiness, and education level in comparison with the other demographic groups. The age group- and profession-based differences in listeners' perception of uptalk, as well as the age group and gender-based differences in listeners' perception of the speakers regardless of the presence of uptalk, merit further exploration in research exploring professions outside of the four featured in this study, characteristics of uptalk outside of trustworthiness and competence, and the perception of female voices across different genders and age groups.

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Appendix A: Passages used in the Voice Comparison Survey

Bank Teller / Test

1. I would consider cancelling your direct **debit**. The locked in policy applies to your **savings**, so have a look at your APs and future withdrawals before setting up any **more**. If you need to make a transfer there will be a break **fee**, so you should consider your liabilities **carefully**.

2. We can help design a better retirement plan with a more in-depth investor **profile**. If you've got a long time horizon and you're comfortable with knowing returns can **vary**, there's the high volatility offered by a growth **fund**. You could also get more diversification from an active **fund**, which may be the most **practical**.

3. We should be able to take the cancelled check as proof of **payment**. We just need to check with the drawee bank to see that it's been **processed**, before you use it to pay off your HP with the lump **sum**. That's a good way to get out of **debt**, sometimes getting out of those credit contracts can be **difficult**.

4. Your return shows there are some employer contribution **issues**. Make sure that they've got the right **figures**, before you claim your MTC for the **year**. It's important to let your KiwiSaver provider know your PIR so you receive the correct tax **rate**, although switching back to the default fund is **optional**.

5. We can look into a bridging loan provided you aren't in arrears on your other loan **payments**. The OCR is so low at the **moment**, I would recommend signing up to a fixed interest **rate**. We'll need a promise date from you as well as your credit **score**, it's our **policy**.

Appendix B: Passages used in the uptalk survey

Doctor

1. You appear to have a ganglion cyst based on your **symptoms**. I'd recommend an aspiration **treatment**, after I inject a steroid compound I'll splint the **wrist**. Your prognosis is **good** and you shouldn't require an MRI or **surgery**.

2. I see that you've been using holistic medication and the NSAIDs in lower **doses**. There is some evidence of erosions on your **x-rays**, so your rheumatologist recommends that you keep taking the **pills**. The risk of carpal tunnel syndrome is **slight**, but if it comes up we can refer you to another **specialist**.

3. Pertussis could result in complications like bronchitis or an increased risk of **seizures**. I'll prescribe you an expectorant to help with the **mucus**, but I highly recommend that you get the Tdap vaccine **soon**. Once you enter the convalescent **stage**, the paroxysmal symptoms will probably affect you less **painfully**.

4. The blepharitis should clear up if you continue avoiding scented lotions and **makeup**. Hot compresses are a good home treatment **option**, and can help you avoid the complications of chalazions or **styes**. Ocular rosacea or permanent eyesight damage is **rare**, but do let me know if you have cataracts or optic neuritis in your family **history**.

5. In the winter cross-reactivity from allergic rhinitis is very **common**. If the antihistamine isn't **helping**, we can consider immunotherapy if you'd **like**. We can also schedule a RAST blood test or an intradermal **test**, to find out if you're sensitive to any other **substances**.

IT Support

1. First check to see if you can bypass any faulty network **hardware**. You should run a system file check and then **defrag**, which usually helps determine the source of the **lag**. Then try rebooting as the last **step**, if there are still issues with network **latency**.

2. I recommend pulling the utilization statistics from your exchange **servers**. Try replacing your current executable with the patch from the link I sent you in the **email**, or launch it directly from the PowerShell **prompt**. Our development team recently made some UI **tweaks**, which should make it **easier**.

3. I suggest upgrading your touch recalibration driver to the 64-bit **version**. I'll need to know a bit more about your most recent OS **updates**, usually the manufacturer provides some firmware to upgrade it for **free**. The latest release has raised a lot of questions about the confidence **flag**, so you may need to rollback to a version we released less **recently**.

4. A second-level domain site is supported best by the nameserver **license**. You'll get more load balancing solutions with that **option**, as well as more **space**. I'll send you a list of easy mapping **tools**, because you'll need to recreate the DNS records at your new **registrar**.

5. Overclocking is probably what caused the **damage**. You may want to consider a hyperthreading processor for your next CPU **purchase**, and that will work like a virtual **core**. You can buy an additional cooler if you **want**, but most of the ones on the market now don't need an extra heatsink to work **properly**.

Lawyer

1. Let's make sure we're clear on the dispute provisions from the original **contract**. Because of the pressure put on you by the defaulting **party**, our changes of arguing undue influence in arbitration are **good**. If it's acceptable for **you**, we could try for a specific performance order from the **ombudsman**.

2. It appears that your redundancy breached both good faith and fair **process**. Before mediation goes any **further**, I'll need evidence that you signed the collective **agreement**. If the period of preference was included in the **terms**, we won't have to go all the way to the ERA **hopefully**.

3. You should clarify whether the sale and purchase refers to a cross-lease or a freehold **title**. This document also doesn't seem to include **chattels**, not to mention an LIM or a possession **date**. It was a good idea to come to **me**, these unconditional agreement loopholes can be **serious**.

4. You could be eligible for depreciation on your capital expenditure using the pooling **method**. It may not be an allowable deduction for your **business**, but potentially from your personal income **tax**. Remember that in order to avoid the withholding tax limitation or other penalty **rates**, you need to have tax **residence**.

5. You could be at risk of engaging in unilateral **conduct**. Once you apply for cartel leniency and get your **marker**, come back to my office and we can talk through the next **steps**. There should be no evidence for bid rigging **fraud**, and certainly no restriction of outputs or anti-competitive agreements between the **companies**.

Librarian

6. I should be able to find the book you're looking for in the **OPAC**. Even if we've deaccessioned our **copy**, there should be another one available for interlibrary **loan**. Have a look at the call numbers adjacent to the reference and you should find some similar **books**, if not I'll request it through the consortium **catalogue**.

7. Bound periodicals like this are usually accessible in the **holdings**. If it's not there or in our circulating **items**, the special collections or course reserves are a good place to **check**. If you've got the ISSN written **down**, I'll help you locate it using the **catalogue**.

8. More specific approach terms will give you better luck with class **entry**. You'll want to be searching for the host book by the original **author**, not an associated **book**. I'll have a look for the primary **source**, it used to be stored with the rest of our **microfiche**.

9. The unabridged version is located in our off-site **archives**. We have some anthologies by the same **author**, or the expurgated edition could be useful for your **search**. There's also a festschrift if you need a secondary **source**, that could be of some **benefit**.

10. All of our serials have a unique DOI listed on the **workslip**. That would change if it's a monograph or a conference **paper**, or an unpublished **text**. I'll try to find some related volumes for **you**, using the value vocabulary in our **database**.