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**Characterising the Linguistic Chameleon:**

**Personal and Social Correlates of Linguistic Style Accommodation**

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***Characterising the Linguistic Chameleon: Personal and Social Correlates of Linguistic Style Accommodation in Human Communication Research.***

**Abstract**

Linguistic style accommodation between conversationalists is associated with positive social outcomes. We examine social power and personality as factors driving the occurrence of linguistic style accommodation, and the social outcomes of accommodation. Social power was manipulated to create 144 face-to-face dyadic interactions between individuals of high versus low power and 64 neutral power interactions. Particular configurations of personality traits (high self-monitoring, Machiavellianism and leadership, and low self-consciousness, impression management and agreeableness), combined with a low power role, led to an increased likelihood of linguistic style accommodation. Further, greater accommodation by low power individuals positively influenced perceptions of subjective rapport and attractiveness. We propose individual differences interact with social context to influence the conditions under which non-conscious communication accommodation occurs.

**Keywords**

Linguistic style, communication accommodation theory, personality, social power, impression formation, linguistic accommodation, interpersonal communication

## Characterising the Linguistic Chameleon:

### Personal and Social Correlates of Linguistic Style Accommodation

The unconscious mimicry of our conversational partners seems to be an intrinsic part of social interaction (Chartrand, Maddux, & Lakin, 2006). Communication Accommodation Theory (CAT) is a comprehensive conceptual framework describing the ways in which people adjust their communication behaviours during social interactions, their motivations for doing so and the social consequences (Giles, Coupland, & Coupland, 1991). CAT proposes that during conversation, each speaker makes ongoing evaluations about their partner and the interaction, and such attributions form the basis of adjustments to their communication behaviours each speaker makes within this and future interactions (i.e., communication accommodation). Adjustments can take several forms: *convergence* describes when people alter their communication behaviours to be more similar to others, whilst *divergence* describes ways in which people accentuate dissimilarities in communicative behaviours.

Within CAT, accommodation is driven by speaker motivations, formed according to perceptions of their partner's communications and the wider social context of the conversation (Giles et al., 1991). Convergence is motivated by the desire (consciously or unconsciously) to gain social approval, and thus acts as an expression of internal motivations to affiliate. Divergence, on the other hand, represents the desire to emphasise or increase social distance between conversationalists. Another central concept within CAT is that people form impressions and evaluate their interaction partners based on perceptions of their communications. Perceptions of convergence in communicative behaviours has been associated with greater evaluations of similarity and liking (Giles, Taylor, & Bourhis, 1973), whereas divergence has generally been associated with evaluations of hostility or impoliteness (Giles & Gasiorek, 2014). A recent meta-analysis of CAT work concluded that

accommodative behaviour is reliably related to positive evaluations of the communication, the individual and the relationship and non-accommodation is associated with negative evaluations (Soliz & Giles, 2014).

Our study concerns a specific aspect of communication accommodation, that of an individual's *linguistic style*. Linguistic style refers to not *what* an individual says, but *how* they say it; two individuals can communicate the same information (the same message content) but convey it in very different ways (their linguistic style). An important aspect of an individual's linguistic style is their use of function words (such as pronouns and articles: *he/she, on, its*), which can be thought of as the 'glue' holding the content of a sentence together. Function words are usually short, frequently used, and processed and produced non-consciously (Chung & Pennebaker, 2007). Function words have little independent semantic meaning and their use relies on shared social knowledge; for instance, comprehending the sentence "he sat down on it" relies on conversationalists sharing an understanding of what ("it") and who ("he") is being referred to in that particular social context. By *linguistic style*, we thus refer to the way an individual uses function words, consistent with definitions adopted by related work in this area (Chung & Pennebaker, 2007; Danescu-Niculescu-Mizil, Lee Bo Pang, & Kleinberg, 2012; Ireland et al., 2011).

A range of evidence suggests a link between an individual's use of function words and social behaviours (Tausczik & Pennebaker, 2010). Pronoun use, for example, has been proposed to be indicative of social status: high status individuals use *I* words less and *you/we* words more than low status individuals (Kacewicz, Pennebaker, Davis, Jeon, & Graesser, 2013). The extent to which two conversationalists are synchronised in their linguistic style (i.e., use similar proportions of function words) has also been proposed to represent their interpersonal alignment (Ireland et al., 2011). Indeed, much of the current literature surrounding synchronisation in linguistic style has focused on its value in predicting social

outcomes. For instance, where conversationalists were synchronised in their linguistic style, this has positively predicted successful outcomes of negotiations (Taylor & Thomas, 2008) and the likelihood of initiating a romantic relationship amongst speed-daters (Ireland et al., 2011). Synchronisation in linguistic style does therefore seem to represent the degree to which dyads are engaged with each other in conversation, suggesting that the study of function word use between conversationalists taps into implicit social processes.

An underexplored question in this area concerns the factors that predict the likelihood of synchronisation in linguistic style actually occurring, within any given conversation. CAT proposes that the goals, beliefs and predispositions individuals bring to a given communication encounter (their *initial orientation*) influence how people may adjust their communications (Dragojevic, Gasiorek, & Giles, In press). Factors influencing an individual's initial orientation are described as macro-factors, and can include an individual's interpersonal history and sociocultural norms. For instance, sociocultural norms influenced the likelihood that people in Hawai'i changed the language they spoke from Pidgin English to Standard English when in a work or education environment (Marlow & Giles, 2008). In our study, we extend previous research into the examination of macro-factors in communication accommodation, to accommodation in an individual's linguistic style. Given that we cannot consciously control our use of function words, examining the factors that influence accommodation in linguistic style has the potential to highlight the conditions under which non-conscious communication accommodation can occur. Factors at both the social contextual and individual level are already predicted within CAT to influence an individual's tendency to accommodate (or not) aspects of their communicative behaviours (Giles, 2008). We briefly review the evidence relating to two such factors that we believe may be influential in accommodation of linguistic style: *social power* and *personality*.

### ***Social Power***

Dyads may converge in their communications symmetrically, or asymmetrically (Gallois & Giles, 1998). Symmetrical convergence refers to mutual convergence by both parties in the conversation (both parties alter their communicative behaviours to be more similar to the other). Asymmetrical convergence, however, occurs when convergence by one partner is not reciprocated. CAT predicts that asymmetrical convergence is particularly likely where there is a power imbalance between interlocutors. People in lower social power/status roles often converge their communications to those in higher/more dominant roles (Giles, 2008). For instance, in New York in the 1970s, African Americans were perceived as holding more power compared to Puerto Ricans, and Puerto Ricans adopted the dialect of African Americans (Wolfram, 1973).

Instances of asymmetrical convergence in association with social power have been observed across a wide range of communication behaviours and situations. These include interviewees converging their speech style towards that of their interviewers during employment interviews (Willemyns, Gallois, Callan, & Pittam, 1997), witnesses in courtrooms accommodating their language use to that of the questioning legal professional (Gnisci, 2005) and students accommodating their verbal and non-verbal behaviours to academic faculty members (E. Jones, Gallois, Callan, & Barker, 1999). CAT predicts that individuals in low power roles will be motivated to seek social approval from their higher power partner, driving their greater convergence (Giles et al., 1991). Consistent with this, asymmetrical convergence is often observed where individuals stand to profit from gaining approval from the other; salespeople have been seen to accommodate their language to customers, to a greater extent than customers have towards salespeople (Van Den Berg, 1986).

Although asymmetrical convergence associated with social power is well documented, evidence as to the effects of social power on linguistic style accommodation is

currently limited. Danescu-Niculescu-Mizil et al. (2012) examined synchronisation in function word use by admins vs. non-admins on Wikipedia pages, and judges versus lawyers in US supreme court. They found status influenced synchronisation in use of function words: use of a particular class of function words (i.e., articles) in one utterance by a high status individual increased the probability of their lower status interaction partner also using that particular class of function words in their next utterance. Along similar lines, Jones et al. (2014) found that individuals who had high levels of reputation within an online community ('leaders') were, in general, less likely to accommodate their linguistic style to those with low reputation in the community ('non-leaders'), compared to the other way around. Thus, there is initial evidence that asymmetrical convergence associated with social power does extend to linguistic style. However, previous work in this area has mostly involved asynchronous communications within online communities, with social status or power inferred from roles within those communities. The generalizability of findings so far is therefore limited. In the present study, we examine if asymmetrical linguistic style accommodation in relation to social power occurs in face-to-face interactions with clearly defined power differentials. Based on predictions from CAT and previous research, we form the following hypotheses:

***H<sub>1</sub>: Social power influences the extent of linguistic style accommodation***

H<sub>1a</sub>: Individuals in a low power role exhibit a greater frequency of conversations characterised by convergence in linguistic style than individuals in a high power role.

H<sub>1b</sub>: Individuals in a low power role exhibit a greater general tendency to accommodate their linguistic style, compared to individuals in a high power role.

***Personality***

Given that the need for social approval drives accommodation, it follows that individual differences that influence an individual's need for approval should shape the degree of accommodation exhibited by that individual. Indeed, one prediction from early

CAT work is that “*measures of social sensitivity...should provide positive relationships with convergence*” (Giles et al., 1991, p. 8). Consistent with these predictions, individuals who scored highly on a measure of ‘need for social approval’ were more likely to converge to their partners communicative behaviours compared to people with low scores (Natale, 1975). Similarly, individuals high in self-monitoring (the motivation and ability to control the image an individual portrays to others) were more likely to mimic the communication behaviours of others, compared to those low in self-monitoring (Cheng & Chartrand, 2003).

Other personality traits that influence an individual’s need for social approval should therefore show similar positive associations with convergence in communication behaviours. For instance, individuals who have high scores on measures of self-consciousness demonstrate a desire to be perceived in positive ways by others (Nezlek & Leary, 2002), and individuals high in impression management are highly motivated to control how they are perceived in a given social encounter (Leary & Kowalski, 1990). Contrarily, personality traits that predispose individuals to be less concerned with seeking social approval should be negatively related to convergence (Dragojevic et al., In press). For instance, individuals who are highly confident, dominant or outgoing (i.e., those high in ‘leadership’ type traits) could be less likely to show convergence in their communications. These personality traits may thus induce individuals to be more or less likely to accommodate their language use to that of their interlocutor, but have yet to be explored in relation to CAT.

Previous work also suggests a range of additional traits, aside from those that influence need for social approval, which may predict the likelihood of linguistic style accommodation. The well-known ‘Big Five’ personality traits of extraversion and its orthogonal trait neuroticism have been demonstrated to influence the extent of linguistic synchronisation: neuroticism was negatively correlated to linguistic synchronisation whilst extraversion was positively related to both linguistic synchronisation, and mimicry of the

non-content features of speech (Hecht, Boster, & LaMer, 1989; Ireland & Pennebaker, 2010). Further, in the behavioural mimicry literature, people were more likely to mimic the behaviours of their interaction partner when they scored highly on the ‘perspective-taking’ facet of empathy (Chartrand & Bargh, 1999) suggesting an empathetic personality may predispose individuals towards greater accommodation. Finally, individuals who have a socially exploitative interpersonal style (i.e., Machiavellian) may also be more likely to accommodate their communications, if it is in their own self-interest to do so.

There are also initial indications of an interaction between social power and personality traits. High self-monitors were more likely to mimic their interaction partner when their partner was someone in a higher position of power, compared to low self-monitors (Cheng & Chartrand, 2003). Relatedly, a previous study into synchronisation in function word use indicates that personal characteristics (such as ambition and social engagement) predisposed individuals to seek out or attain positions of high status, and were thus less likely to echo the function word use of those in lower status (Danescu-Niculescu-Mizil et al., 2012). However, personal characteristics in this study were inferred from data such as the volume of an individual’s communications, and so the effects of personality on function word synchronisation was not captured directly.

So far, personality traits have received limited attention in the CAT literature. However, taken together, previous research does indicate that an individual’s stable personality traits could straightforwardly predict the likelihood of communication accommodation occurring and/or interact with social power. We extend the literature base of CAT in relation to personality by exploring a range of personality traits with respect to linguistic style accommodation. Based on predictions from CAT and previous research, we form the following hypotheses:

**H<sub>2</sub>: *Personality traits influence the extent of linguistic style accommodation***

H<sub>2a</sub>: Personality traits associated with the need for social approval (*self-monitoring, self-consciousness, impression management*), concern for others (*empathy*), a self-serving social style (*Machiavellianism*) or sociality (*extraversion*) will show a positive relationship to the tendency to accommodate linguistic style. Personality traits associated with high self-confidence (*leadership*) or introversion (*neuroticism*) will show a negative relationship to the tendency to accommodate linguistic style.

H<sub>2b</sub>: Personality traits interact with social power to influence the extent of linguistic style accommodation: personality traits associated with the need for social approval (*self-monitoring, self-consciousness, impression management*) will show a positive relationship to the tendency to accommodate linguistic style, but only for individuals in a low power role.

### ***Social Outcomes of Accommodation***

CAT predicts that accommodation is associated with positive social outcomes (Giles et al., 1991) and research suggests this is indeed the case. Verbal mimicry, for instance, has resulted in waitresses receiving bigger tips (van Baaren, Holland, Steenaert, & van Knippenberg, 2003), higher sales, and more positive perceptions of the mimicker (Jacob, Gueguen, Martin, & Boulbry, 2011).

Accommodative communications have also been associated with favourable evaluations of the speaker by the recipient, across a range of interpersonal dimensions. Firstly, convergence in speech or non-verbal behaviours has resulted in increased perceived *similarity* between interactants (Giles, 2008). Dyadic participants who converged in pause duration perceived greater similarities in attitudes and personality (Welkowitz & Feldstein, 1969). Secondly, convergence in non-verbal behaviours (mimicking body language, facial expressions, or gaze) has been associated with feelings of *rapport* between interactants (Lakin & Chartrand, 2003). Further, verbal mimicry has been positively related to perceptions of the speaker's *attractiveness*. Mimicry of verbal expressions by participants in

a speed dating scenario was associated with higher evaluations of attractiveness of the mimicker (Guéguen, 2009). Pertinently, these effects have also applied across relationships with power differentials: interviewees who converged to interviewers on their speech rate were rated highly in social attractiveness (Putman & Street, 1984). Finally, increased speech similarity between conversationalists has resulted in enhanced perceptions of the *communicative effectiveness* of the speaker (Giles & Smith, 1979).

Accommodation along a variety of communicative dimensions is therefore reliably related to positive evaluations of the speaker (Soliz & Giles, 2014). Accordingly, we would expect accommodation in linguistic style to also be favourably evaluated by the recipient. Previous research indicates linguistic style synchronisation between interactants does predict positive social outcomes, but these outcomes have been operationalised in terms of dyadic measures, such as successful outcomes of negotiations (Taylor & Thomas, 2008), as opposed to individual recipient evaluations of the speaker. Thus, we examine if linguistic style accommodation is predictive of positive recipient evaluations, as predicted by CAT and previous research.

H<sub>3</sub>: Greater linguistic style accommodation by a speaker is associated with positive perceptions of the speaker's similarity, rapport, attractiveness and communicative effectiveness by the recipient.

### ***Measures of Linguistic Style Accommodation***

In the past, quantifying verbal mimicry or linguistic accommodation involved time consuming and laborious hand-coding techniques. Computational tools have thus been developed to rapidly measure similarity in language use within a piece of text or between individuals. One such popular method is Linguistic Style Matching (LSM), which measures the degree to which two conversationalists are synchronised in their use of function words (Niederhoffer & Pennebaker, 2002). LSM is calculated by firstly analysing transcripts of

conversations with the computerised text analysis program Linguistic Inquiry and Word Count (LIWC; Pennebaker, Booth, & Francis, 2007). LIWC processes a text file word by word, comparing each word to the dictionary and providing a count of the words in the file that match each category in the dictionary. Sums of words in each category are presented as percentage of total words in the file. LSM is calculated by computing the extent to which an individual's use of nine function word categories (see Table 1, below) matches that of their conversational partner, as a proportion of total use of function words over the whole conversation (Ireland et al., 2011). LSM scores range between 0 and 1, with higher scores illustrating greater similarity in linguistic style between two speakers.

<Table 1 about here>

However, one issue with the LSM measure is that it fails to capture who is accommodating to whom, within any given interaction. LSM does not reveal if one individual in a dyad changes their usual linguistic style to a greater, or lesser, extent compared to their conversational partner. For instance, within a conversation, one member of a dyad could maintain their usual linguistic style whilst their partner converges their linguistic style to match, but the LSM measure will not detect this subtle distinction. The ability to easily identify who is accommodating to whom within a given interaction is vital for our exploration of the factors predictive of linguistic style accommodation. Thus, we utilise an alternative method for quantifying accommodation in linguistic style, known as Zelig Quotient or ZQ (S. Jones et al., 2014). ZQ uses the same set of nine LIWC function word categories as LSM (see Table 1). However, ZQ goes beyond LSM by firstly determining an individual's baseline, or usual, use of the nine function word categories (i.e., linguistic style). The extent to which an individual changes their linguistic style from their usual style to converge towards or diverge away from the linguistic style of each of their conversational partners can then be computed (*pairwise speaker to recipient ZQ scores*).

Further, by averaging the pairwise ZQ scores across all conversational partners, we can also estimate the individual's *general tendency* to accommodate their linguistic style to that of others (*overall ZQ scores*). Positive Zelig Quotients (greater than zero) represent convergence to the linguistic style of their conversational partner. Negative scores (less than zero) represent divergence away from the linguistic style of their partner. Zelig Quotients close to zero represent maintenance of the individual's own typical linguistic style, with any movement in linguistic style due to noise, rather than convergence or divergence.

### ***Study Overview***

The overarching aim of our study was to extend the existing literature surrounding CAT in relation to social power and personality, to the relatively underexplored area of accommodation in an individual's linguistic style. Specifically, we tested the importance of social power and personality in predicting the likelihood of linguistic style accommodation, both separately and as an interaction, and the social outcomes of such accommodation in terms of recipient evaluations of the speaker. To address this aim, we utilised a novel experimental manipulation of social power, to ensure differences in power between conversationalists were clearly defined. Participants in low and high power roles had a series of five-minute face-to-face conversations, which were audio-recorded and transcribed. We applied the ZQ metric to yield a measure of linguistic style accommodation for each participant, for each conversation and as an overall tendency within his or her social role.

## **Method**

### ***Participants and Design***

Forty participants (twenty-eight females and twelve males), aged between 19 and 22 years old ( $M = 21.03$  yrs.,  $S.D. = 1.92$ ) took part in the study, which was advertised as a 'speed networking session'. Within each speed networking session, as explained below, twelve participants were in the high power group (Judges) and twelve participants in the low

power group (Workers). Sixteen participants were in the neutral power control group (Collaborators). Participants were unknown to each other prior to the study, and were paid a small monetary reward in exchange for their participation.

### ***Procedure and Measures***

*Personality Questionnaires* Prior to attending the speed networking session, participants completed personality questionnaires administered using Qualtrics online survey software ([www.qualtrics.com](http://www.qualtrics.com)). Participants completed the following self-report personality measures between one and five days prior to the speed networking session: Self Consciousness Scale (Scheier & Carver, 1985; 23 items,  $\alpha = .78$ ,  $M = 37.32$ ,  $S.D = 9.11$ ); Impression Management (D. L. Paulhus, 1991; 20 items,  $\alpha = .83$ ,  $M = 65.11$ ,  $S.D = 10.32$ ); Self-Monitoring (Snyder, 1974; 9 items,  $\alpha = .81$ ,  $M = 25.89$ ,  $S.D = 6.20$ ); Machiavellianism (Jackson, 1994; 6 items,  $\alpha = .75$ ,  $M = 18.98$ ,  $S.D = 3.82$ ); the NEO-PI-R (Costa & McCrae, 1992) measuring Openness to Experience (20 items,  $\alpha = .87$ ,  $M = 73.43$ ,  $S.D = 11.52$ ), Conscientiousness (20 items,  $\alpha = .89$ ,  $M = 68.93$ ,  $S.D = 11.42$ ), Extraversion (20 items,  $\alpha = .91$ ,  $M = 74.16$ ,  $S.D = 10.81$ ), Agreeableness (20 items,  $\alpha = .88$ ,  $M = 75.51$ ,  $S.D = 10.97$ ), and Neuroticism (20 items,  $\alpha = .91$ ,  $M = 59.09$ ,  $S.D = 13.37$ ); Leadership (Goldberg, 1999; 10 items,  $\alpha = .86$ ,  $M = 35.37$ ,  $S.D = 5.81$ ); Empathy Quotient (Baron-Cohen & Wheelwright, 2004; 40 items,  $\alpha = .72$ ,  $M = 24.66$ ,  $S.D = 6.14$ ).

*Speed Networking: Judges vs. Workers* Upon arrival, participants were randomly allocated to either the ‘judge’ ( $N = 12$ ) or ‘worker’ role ( $N = 12$ ). Workers were given a number of hypothetical business ideas to pitch to judges. Judges were responsible for evaluating ideas and could augment each workers’ base rate of pay, whereas judges were paid a set amount (which was a higher amount than workers). Workers were thus outcome dependent on judges, creating a power imbalance. Judges remained seated in private booths, whilst workers moved between booths, having a five-minute conversation with each judge,

which was audio-recorded. Each participant thus had twelve conversations: each of the twelve workers had a conversation with each of the twelve judges, generating a total of 144 five-minute dyadic interactions between high and low power individuals.

*Speed Networking: Collaborators* Upon arrival, participants were randomly allocated to one of two groups (Group A and Group B). Group B collaborators ( $N = 8$ ) were given hypothetical business ideas to discuss with Group A collaborators ( $N = 8$ ). It was the joint responsibility of collaborators to evaluate ideas, and they were paid an equal amount at the end of the study. Group A collaborators remained seated in private booths, whilst participants in Group B moved between booths, having a five-minute conversation which was audio-recorded. Each participant thus had eight conversations: each of the eight participants in Group A had a conversation with each of the eight participants in Group B, generating a total of 64 five-minute dyadic interactions between individuals of neutral power.

*Measures of Interaction Quality and Impression Formation* At the end of each five-minute conversation, workers and Group B collaborators rotated around to the next booth. All participants then completed measures of interaction quality and impression formation relating to their previous conversational partner. Participants moved to the next booth before completing these measures in order to avoid feelings of awkwardness associated with completing ratings about the person sitting opposite them (c.f. Finkel, Eastwick, & Matthews, 2007). Participants completed the following after each conversation: (1) a measure of similarity to their partner (Ireland et al., 2011; 2 items,  $\alpha = .93$ ,  $M = 11.33$ ,  $S.D = 3.68$ ); (2) a measure of subjective ‘clicking’ or rapport felt during the interaction (Niederhoffer & Pennebaker, 2002; 3 items,  $\alpha = .73$ ,  $M = 14.32$ ,  $S.D = 3.69$ ); (3) a measure of their partner’s overall conversational effectiveness (Spitzberg, 1995; 5 items,  $\alpha = .92$ ,  $M = 28.67$ ,  $S.D = 5.71$ ); and (4) measures of their partner’s social (4 items,  $\alpha = .84$ ,  $M = 14.31$ ,  $S.D = 2.98$ ), physical (4 items,  $\alpha = .77$ ,  $M = 12.68$ ,  $S.D = 2.46$ ) and task attractiveness (4 items,  $\alpha = .85$ ,  $M$

= 15.39,  $S.D = 2.66$ ; McCroskey & McCain, 1974). Judges had additional measures to complete after each conversation - evaluating the worker's idea and awarding any extra money.

At the end of the speed networking session, participants completed a manipulation check, rating the extent to which they had power during the conversations, on a scale from 1 (not at all) to 5 (very much). Participants were then debriefed and paid an equal amount.

### *Calculating ZQ as a measure of Linguistic Style Accommodation<sup>1</sup>*

The audio recordings were firstly passed to an external professional transcribing service for verbatim transcription. The first author then checked each transcript against the original audio recording to correct any errors, and ensure all spoken words by participants were captured in the transcription. The transcripts were then processed using the Linguistic Inquiry and Word Count program (Pennebaker et al., 2007) to yield the percentages of function words uttered by each participant in each turn, in each conversation. These percentages were used to calculate ZQ scores for each participant, following the procedure described in Jones et al. (2014)<sup>2</sup>.

## **Results**

### *Manipulation check*

A one-way ANOVA confirmed a significant difference in perceived personal power between the groups of judges, workers and collaborators ( $F(3, 37) = 6.41, p = .004, \eta^2 = .52$ ). Judges perceived they had a greater level of personal power ( $M = 3.72, S.D. = 1.11$ ) compared to Workers ( $M = 2.84, S.D. = 1.12$ ). There was no such difference in the two groups of collaborators, who gave similar ratings of personal power (Group A  $M = 1.83, S.D. = 1.10$ , Group B  $M = 2.02, S.D. = 1.11$ ). Thus, the experimental manipulation of social power was successful in inducing the perception of a power difference between participants.

### *The Effects of Social Power and Personality upon Linguistic Style Accommodation*

Our first hypothesis predicted that individuals in the low power role would exhibit a greater frequency of conversations characterised by convergence in linguistic style than individuals in a high power role ( $H_{1a}$ ). Figures 1 and 2 present the pairwise speaker-to-recipient ZQs for judges vs. workers (high vs. low power) and the two groups of collaborators (neutral power), as a percentage of the total number of conversations. These scores demonstrate the extent to which each individual accommodated their linguistic style within each conversation. Social role was a significant predictor of the frequency to which individuals exhibited divergence or convergence ( $\chi^2(3) = 8.85, p = .03$ ). Judges exhibited a greater percentage of negative ZQs (indicating linguistic style divergence) compared to workers (60% of conversations compared to 45%). Supporting  $H_{1a}$ , the opposite is true for convergence: workers showed a greater percentage of positive ZQs (indicating linguistic style convergence) compared to judges (39% of conversations compared to 24%). Collaborators show similar levels of divergence (Group A 63%, Group B 58%) and convergence (Group A 23%, Group B 25%). Thus, low social power induced lower levels of linguistic style divergence and higher levels of convergence towards higher power partners, within individual conversations.

*<Figures 1 and 2 about here>*

$H_{1b}$  predicted that individuals in a low power role would exhibit a greater general tendency to accommodate their linguistic style, compared to individuals in a high power role. Examining overall ZQ scores (representing an individual's general tendency to accommodate within their social role) firstly revealed that divergence in typical linguistic style was common; on average, all groups exhibited negative overall ZQ scores. A one-way ANOVA revealed social power was a significant influence upon overall ZQ ( $F(3, 37) = 3.11, p = .04, \eta^2 = .22$ ). Supporting  $H_{1b}$ , the overall ZQ of workers ( $M = -.11, S.D. = .12$ ) was greater than those of judges ( $M = -.26, S.D. = .11; t(22) = -2.93, p = .007, d = 1.31$ ) demonstrating that

workers exhibited significantly less divergence in their typical linguistic style compared to judges. There were no significant differences in overall ZQ between collaborators (Group A  $M = -.26$ ,  $S.D. = .18$ , Group B  $M = -.24$ ,  $S.D. = .15$ ;  $t(15) = 1.34$ , n.s.,  $d = .12$ ).

Turning to the effects of personality, we predicted that personality traits would be positively or negatively related to the general tendency to accommodate linguistic style within a social role (H<sub>2a</sub>) and/or would interact with social power to influence the extent of linguistic style accommodation (H<sub>2b</sub>). We conducted a series of moderation analyses using model 1 of the PROCESS macro for SPSS, which enables statistical testing of single and multiple moderator models, including estimating interactions and simple slopes for probing interactions (Hayes, 2013). For each personality trait, we tested if the relationship between social power ( $x$ , coded as 0 = low power, 1 = neutral power, 2 = high power) and overall ZQ scores ( $y$ ) was moderated by the personality trait ( $m$ ). Where an interaction between social power and a personality trait was statistically significant (indicated by a significant  $R^2$  change value for the interaction term) we probed the interaction further by predicting overall ZQ scores for each social power group along the 10<sup>th</sup>, 25<sup>th</sup>, 50<sup>th</sup>, 75<sup>th</sup> and 90<sup>th</sup> percentiles of the personality variable. Each analysis tested for simple main effects of the personality trait and social power upon overall ZQ and interactions between the two variables, whilst controlling for all other effects and interactions in the model.

Results of the moderation analyses are presented in Table 2. H<sub>2a</sub> is supported, in that several personality traits straightforwardly predicted overall ZQ. With increasing agreeableness, impression management and self-consciousness, overall ZQ decreased, whereas with increasing Machiavellianism, leadership and self-monitoring, overall ZQ increased. Further, these personality traits were also significant moderators of the relationship between social power and overall ZQ, supporting H<sub>2b</sub>.

<Table 2 about here>

Decomposition of the moderation results are plotted in Figures 3 and 4 (below). For participants with lower levels of agreeableness, impression management or self-consciousness, being in the worker role (low social power) was associated with increased likelihood of linguistic style accommodation compared to participants with low levels of these traits in the judge role (high social power). However, for participants with higher levels of these traits social power did not affect the likelihood of linguistic style accommodation (Figure 3). The opposite pattern is observed for the traits of Machiavellianism, leadership and self-monitoring (Figure 4). Social power did not influence the likelihood of linguistic style accommodation for participants with lower levels of these traits, whereas participants with higher levels responded to being placed in the worker role (low social power) with an increased likelihood of linguistic style accommodation, compared to participants with high levels of these traits who were placed in the judge role (high social power).

<Figures 3 and 4 about here>

### ***Social outcomes and antecedents of linguistic style accommodation***

Our final hypothesis predicted that greater linguistic style accommodation by a speaker would be associated with positive perceptions of the speaker's similarity, rapport, attractiveness and communicative effectiveness by the recipient (H<sub>3</sub>). In this analysis, we predicted Person B's ratings of A from the extent of Person A's linguistic style accommodation. We utilised the linear mixed effects model procedure (MIXED) in SPSS, which allows analysis of data as with traditional linear multiple regression techniques, whilst controlling for the clustering in our dataset resulting from repeated measurements nested within individuals (Heck, Thomas, & Tabata, 2014, pp. 4 - 11). Firstly, with increases in workers ZQ, there was a corresponding increase in judges ratings of 'clicking' ( $b = 2.52, t(47) = 8.01, p < .001$ ), and social attractiveness ( $b = 1.02, t(50) = 2.21, p = .03$ ). These relationships were not replicated for judges or collaborators. Secondly, increasing ZQ was

associated with being perceived as a competent communicator, regardless of social power: with increases in ZQ, ratings of conversational ability also increased ( $b = 1.53$ ,  $t(30) = 2.91$ ,  $p = .005$ ). Consistent with H<sub>3</sub>, linguistic style accommodation by an individual in a low power position had a positive influence on the impression formed of them by their higher power interlocutor.

CAT predicts that one motivation for accommodation is affective; that individuals accommodate as an expression of liking or internal motivations to affiliate with their interlocutor (Giles et al., 1991). Thus, we also conducted an exploratory analysis in which we examined if linguistic style accommodation by Person A (the speaker) positively predicted their perception of interaction quality and/or the impression formed of Person B (their partner). ZQ of workers negatively predicted the ratings of similarity ( $b = -3.12$ ,  $t(81) = -3.43$ ,  $p = .001$ ), and clicking ( $b = -1.91$ ,  $t(92) = -1.92$ ,  $p = .05$ ) they gave their conversational partner. These patterns were specific to participants in the worker role. Thus, the greater the linguistic style accommodation by individuals in a low power role, the poorer their perception of the quality of the interaction.

## **Discussion**

In our study, we investigated one intergroup (social power) and one interpersonal (personality) factor in relation to linguistic style accommodation. In general, linguistic divergence was common in our participants. Importantly, workers diverged their linguistic style to a lesser extent compared to judges, and on a conversation-by-conversation level, a greater percentage of workers converged to judges than vice versa. Thus, low power increased the likelihood of linguistic style accommodation towards a higher power partner. Moreover, certain personality traits predisposed individuals towards accommodating their linguistic style, but only when placed in a low power role. Finally, linguistic style accommodation by individuals in a low power position positively influenced perceptions of

conversational quality and the impression formed by their higher power partner.

### *Linguistic Style Divergence and Social Power*

The linguistic divergence exhibited by judges and workers is consistent with previous research into the use of personal pronouns (a class of function words) and status. People in high power/status roles tend to use more first person plural pronouns (*we, us, our*) and fewer first person singular pronouns (*I*), compared to lower status. This is hypothesised to reflect a greater focus on the other when in a high power role, compared to greater focus on the self in a low power role (Kacewicz et al., 2013). Thus, differing use of personal pronouns by individuals in high versus low power roles would manifest as objectively measured divergence in linguistic style, but actually is in line with their social power roles.

Relatedly, the concept of *speech complementarity* could account for the observed divergence in linguistic style in judges and workers (Dragojevic et al., In press). This refers to instances where divergence is consistent with social roles. For instance, males and females have been observed to diverge from each other in their speech behaviours (such as tone), in order to remain consistent with traditional sex role stereotypes (Giles et al., 1991). Speech complementarity is particularly common where there is a power differential between conversationalists, as in our study. In doctor-patient interactions, doctors (in the more dominant position) have been found to produce more questions and talk for longer, whereas patients were more submissive, in line with their help-seeking role (Street, 1991). Speech complementarity thus reflects and reinforces social differences; if both parties expect and prefer communicative differences, speech divergence will be positively received.

The asymmetrical divergence exhibited by workers and judges is in line with predictions from CAT, suggesting low social power triggered motivations in workers to gain the approval of the higher power partner, leading to relatively greater accommodation in linguistic style. Interestingly, increasing linguistic style accommodation by low power

participants also negatively predicted their ratings of interaction quality. Hypothetically, linguistic style accommodation by low power participants could represent an attempt to repair or improve a perceived lack of rapport with their higher power interlocutor. This would be consistent with research indicating behavioural mimicry is sometimes used as a strategy to repair a failed attempt at affiliation (Lakin & Chartrand, 2003). An alternative account is that workers were exhibiting *reluctant accommodation* (Soliz & Giles, 2014). Workers were dependent on positive evaluations from judges for a good outcome, in terms of being awarded extra pay. Thus, workers *reluctantly* accommodated due to cultural norms and outside pressures, instead of internal motivations to affiliate. Reluctant accommodation is usually negatively associated with evaluations of the relationship and recipient (Soliz & Giles, 2014), which is consistent with our findings.

Our finding that linguistic style accommodation was associated with positive impression formation is in line with predictions from CAT and previous research (i.e., Putman & Street, 1984). Further, the positive relationship between linguistic style accommodation and perceived communicative effectiveness (regardless of social power) echoes suggestions that relative similarity in speech rates, language use and accent are perceived as signs of a competent communicator (Giles & Smith, 1979). A proposed by-product of linguistic convergence is the increased intelligibility of the sender's communications (Dragojevic et al., In press) and our results are consistent with this view.

The control group also exhibited divergence in linguistic style, similar to previous research on communications in online community forums (Huffaker, Jorgensen, Iacobelli, Tepper, & Cassell, 2006; S. Jones et al., 2014) suggesting divergent communications are perhaps quite prevalent. Within CAT, divergence is usually a result of the desire to “*emphasise distinctiveness from one's interlocutor*” (Soliz & Giles, 2014, p. 5). This implies that our participants wished to emphasise their unique identity and contribution to the

discussion, leading to mutual and symmetrical divergence in linguistic style. Alternatively, people are proposed to have optimal tolerance levels of convergence and divergence, which are influenced by sociocultural norms (Dragojevic et al., In press). In this particular social context, convergence on several communicative dimensions (i.e., linguistic style, speech rate and content) by a stranger with no detectable motives to accommodate could have been perceived as over-accommodative or ‘over-familiar’ (Giles & Smith, 1979). Moreover, convergence and divergence are not necessarily mutually exclusive (Dragojevic et al., In press). Thus, divergence in function word use could conceivably have been balanced by convergence on other aspects of communication that we did not capture.

#### *Linguistic style accommodation and personality*

Individuals with a particular configuration of personality traits were especially likely to deviate from the common pattern of divergence, by decreasing divergence or increasing convergence in response to low social power. These personality traits were those associated with high self-confidence (leadership), ability to monitor their own behaviour in response to social cues (self-monitoring), high self-interest and an exploitative interpersonal style (Machiavellianism), combined with low concern with being liked (agreeableness), and low self-awareness or concern for social approval (self-consciousness, impression management). This cluster of traits could be considered similar to those described as the ‘Dark Triad’ of personality (psychopathy, narcissism, and Machiavellianism; D. L Paulhus & Williams, 2002). Our results are consistent with the idea that dark triad traits facilitate a social style aimed at exploiting or influencing others: for instance, dark triad traits have been associated with manipulating individuals or situations for self-interest in the work environment (Jonason, Slomski, & Partyka, 2012). In our study, individuals with such ‘dark triad’ type traits, who were placed in the low power position, were less likely to diverge in their communications in order to remain consistent with their social role (i.e., speech

complementarity). Rather, these individuals were more likely to change their linguistic style (alongside, possibly, other aspects of their communications) to be more like that of their conversational partner, in order to exert social influence for personal gain.

Given the somewhat anti-social nature of these personality traits, the association between linguistic style accommodation in workers and positive impression formation appears somewhat counter-intuitive. Hypothetically, this suggests that linguistic accommodation is a powerful and unconscious cue into impression formation; a cue that could potentially be more influential than other, more outwardly detectable aspects of the individual's behaviour. For instance, behavioural mimicry does not have to be explicitly detected in order to have a positive effect on perceptions of the mimicker (Bailenson & Yee, 2005). In line with this, our results suggest that even if an individual has some outwardly anti-social personality traits (i.e., low agreeableness), the effects of accommodating one's linguistic style could be powerful enough to overcome these, and positively influence the recipient's perceptions.

### *Limitations and future directions*

Divergence and convergence can be unimodal (only a single dimension of communication) or multimodal (several aspects of communication simultaneously). Our study focussed on an individual's use of function words (linguistic style). We thus detected unimodal, asymmetrical divergence associated with social power. However, convergence and/or divergence in other aspects of communication could have occurred, implying the effects of social power are multimodal. Such aspects could include speech rates, or other linguistic features such as content, but these were not captured in our study. Along similar lines, it is possible that the results we have observed were attributable to movement in a single linguistic feature, such as pronouns. Thus, it could be informative to examine accommodation of specific linguistic features as an extension to our work on composite

linguistic style. It should be possible to amend the Zelig metric to use greater, fewer or different linguistic features in future research, in order to explore these possibilities.

We acknowledge that a relatively small sample size means our interpretations are necessarily limited. Relatedly, our participants talked for only a short amount of time (five minutes per conversation). It is plausible that the linguistic divergence we observed was as a result of individuals establishing their own identities through talk at the outset of the conversation, and longer discussions could have allowed patterns of maintenance or convergence to emerge. We further acknowledge that participants completing measures of interaction quality and impression formation immediately following each conversation is not ideal, as it could prime participants as to what to expect/look for during the conversations. However, this approach has been used in research into the role of language style matching in predicting relationship initiation in speed dating (Ireland et al., 2011). We also believe that an alternative approach, such as participants batch completing measures after all conversations had taken place, might compromise the accuracy of reporting due to the increased likelihood of retrospective memory errors.

There are many additional future directions to be explored in this research area. Firstly, we plan to extend our research from face-to-face interactions to computer-mediated communications. By doing so we can explore the relative importance of verbal vs. non-verbal communications in impression formation. Further, individuals from cultures which value social relationships (i.e., collectivist cultures such as China) have been shown to be more likely to accommodate their behaviour compared to individualist cultures which value task efficiency, such as the USA (Bi, Fussell, & Birnholtz, 2014). It would be interesting to examine if the same effects of social power upon linguistic accommodation occur with participants of a more collectivist culture, which could potentially shed some light on the importance of the wider social context upon the likelihood to accommodate.

One question remaining within CAT concerns the circumstances in which accommodation and non-accommodation is conscious versus non-consciously invoked (Giles, 2008, p. 170). We take steps towards addressing this question by identifying some of the social and personal factors that drive an individual to accommodate their linguistic style. We demonstrate that accommodation in linguistic style results from the interaction between an individual's stable personality traits and the social context. Linguistic style accommodation is an instance of non-conscious accommodation. Thus, further examination of the factors which increase, decrease and moderate its occurrence have the potential to highlight a range of implicit social processes influencing interpersonal relationships.

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<sup>1</sup> We also calculated LSM for each conversation, and repeated all of our analyses using LSM in place of ZQ. The presence of LSM was established by conducting a single sample t-test against the null hypothesis that LSM in the sample is equal to zero (c.f. Niederhoffer & Pennebaker, 2002). This revealed that linguistic style matching did occur: participants matched the level to which they used function words ( $t(215) = 88.5, p < .001, d = 6.05$ ). However, the use of LSM failed to detect any differences in linguistic style accommodation due to social power or personality, and was not predictive of any of our measures of interaction quality or impression formation. For clarity, we do not discuss these results further.

<sup>2</sup> An example of how ZQ is calculated is as follows. To characterise the extent to which a particular worker accommodated (or not) their linguistic style, we first estimated their baseline linguistic style by averaging the percentages of function words they uttered across their twelve conversations with judges in the study. We then calculated the extent to which, for each individual conversation, variation in the worker's linguistic style from their baseline was due to noise, or due to convergence towards (or divergence away from) the judge's linguistic style. This yields a pairwise speaker-to-recipient ZQ score for each conversation. Each of the twelve pairwise ZQ scores (i.e., a score for each conversation) was then averaged to yield an overall ZQ score for that individual, representing general tendency to accommodate their linguistic style within the worker role.

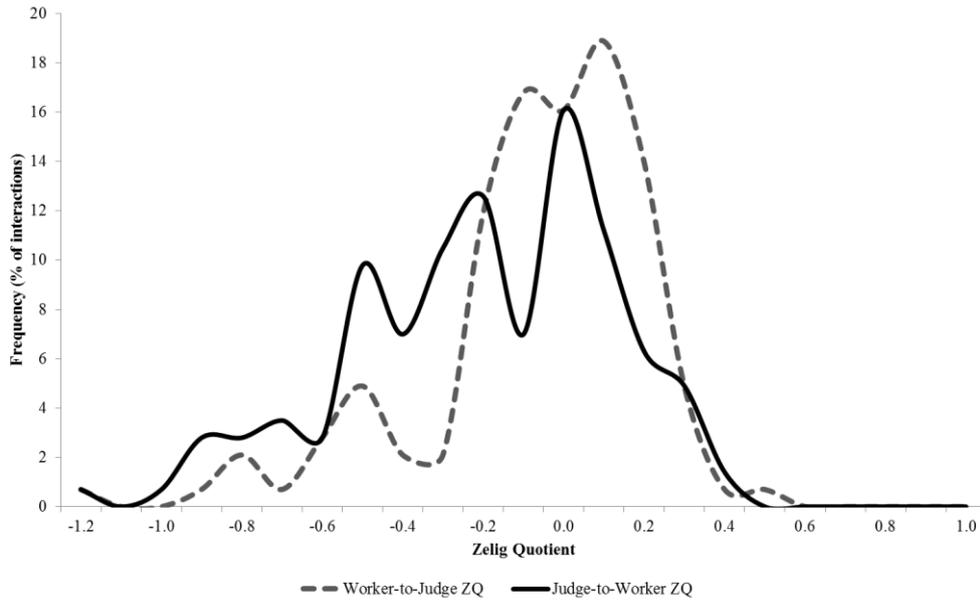
**Table 1.** Word categories used for calculating Linguistic Style

<b>Category</b>	<b>Examples</b>
Personal pronouns	I, his, their
Impersonal pronouns	It, that, anything
Articles	A, an, the
Conjunctions	And, but, because
Prepositions	In, under, about
Auxiliary verbs	Shall, be, was
High frequency adverbs	Very, rather, just
Negations	No, not, never
Quantifiers	Much, few, lots

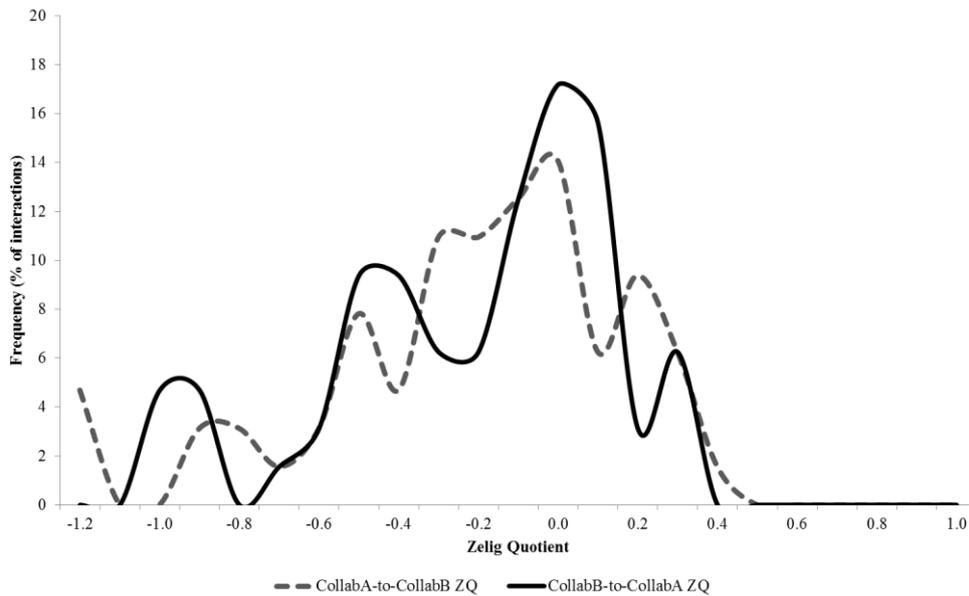
**Table 2.** Moderation analysis of social power and personality on overall tendency to accommodate linguistic style within a social role.

Predictor	<i>B</i>	95% CI	<i>t</i>	<i>R</i> <sup>2</sup> change for interaction term
Social role	-.252	-.367, -.138	-4.33**	
Agreeableness	-.007	-.009, -.005	-7.89**	.023, <i>F</i> (1, 428) = 13.23**
Self-consciousness	-.006	-.009, -.004	-6.25**	.031, <i>F</i> (1, 428) = 15.01**
Impression Management	-.006	-.008, -.004	-4.95**	.032, <i>F</i> (1, 428) = 16.22**
Machiavellianism	.011	.006, .015	4.38**	.024, <i>F</i> (1, 428) = 7.73*
Leadership	.011	.007, .014	5.88**	.021, <i>F</i> (1, 428) = 12.32**
Self-Monitoring	.011	.006, .014	5.06**	.044, <i>F</i> (1, 428) = 17.32**
Empathy	-.004	-.062, .102	.48	.003, <i>F</i> (1, 428) = 1.52
Extraversion	.001	-.001, .003	1.25	.001, <i>F</i> (1, 428) = .10
Openness	.004	-.001, .005	1.68	.002, <i>F</i> (1, 428) = .93
Conscientiousness	.004	-.001, .005	1.03	.002, <i>F</i> (1, 428) = 1.04
Neuroticism	.001	-.001, .003	1.74	.001, <i>F</i> (1, 428) = .10

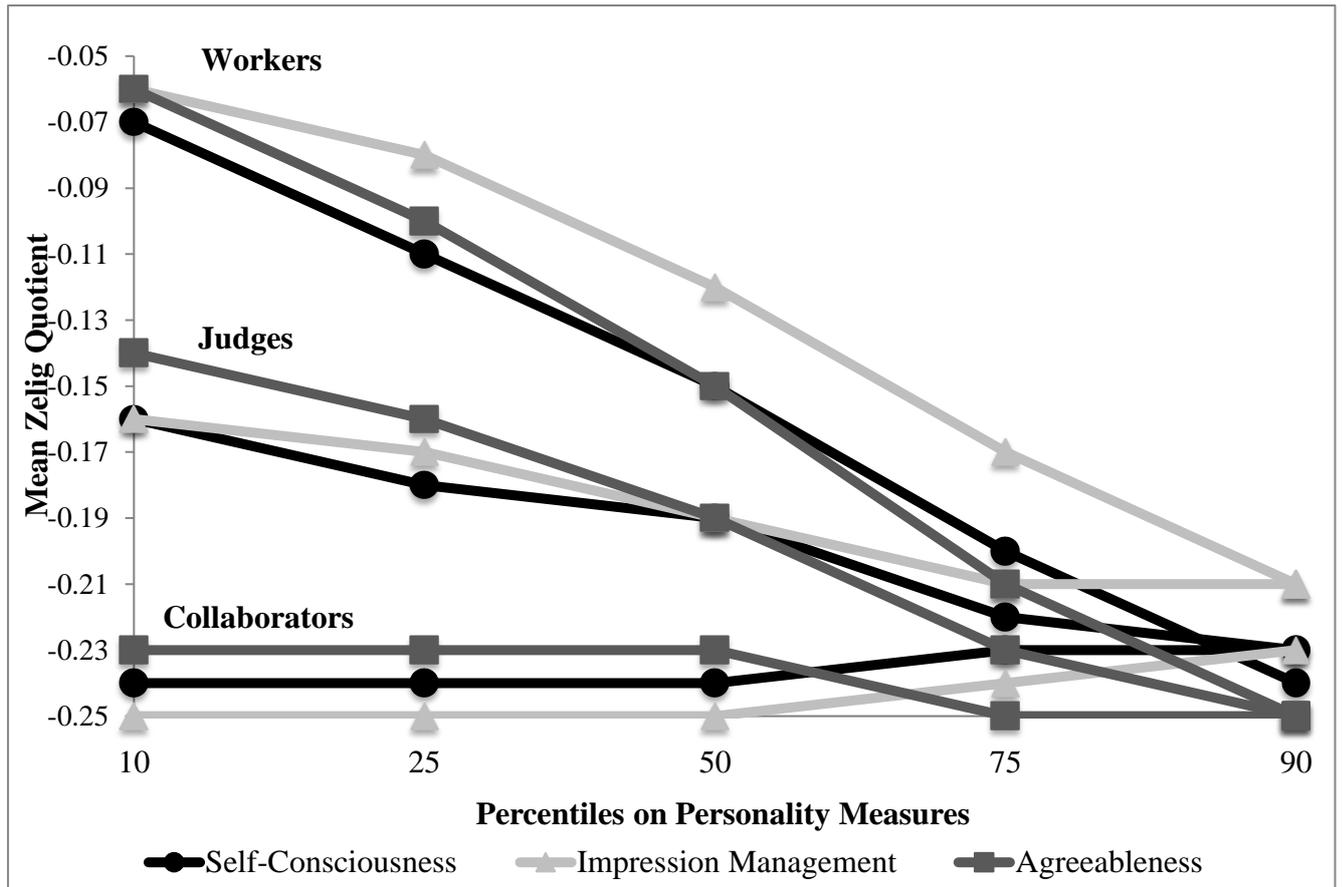
\**p*<.01, \*\**p*<.001. *b* refers to the coefficient for the main effect. *R*<sup>2</sup>change refers to the improvement in model fit with the inclusion of the personality trait x social role interaction term compared to simple effects alone.



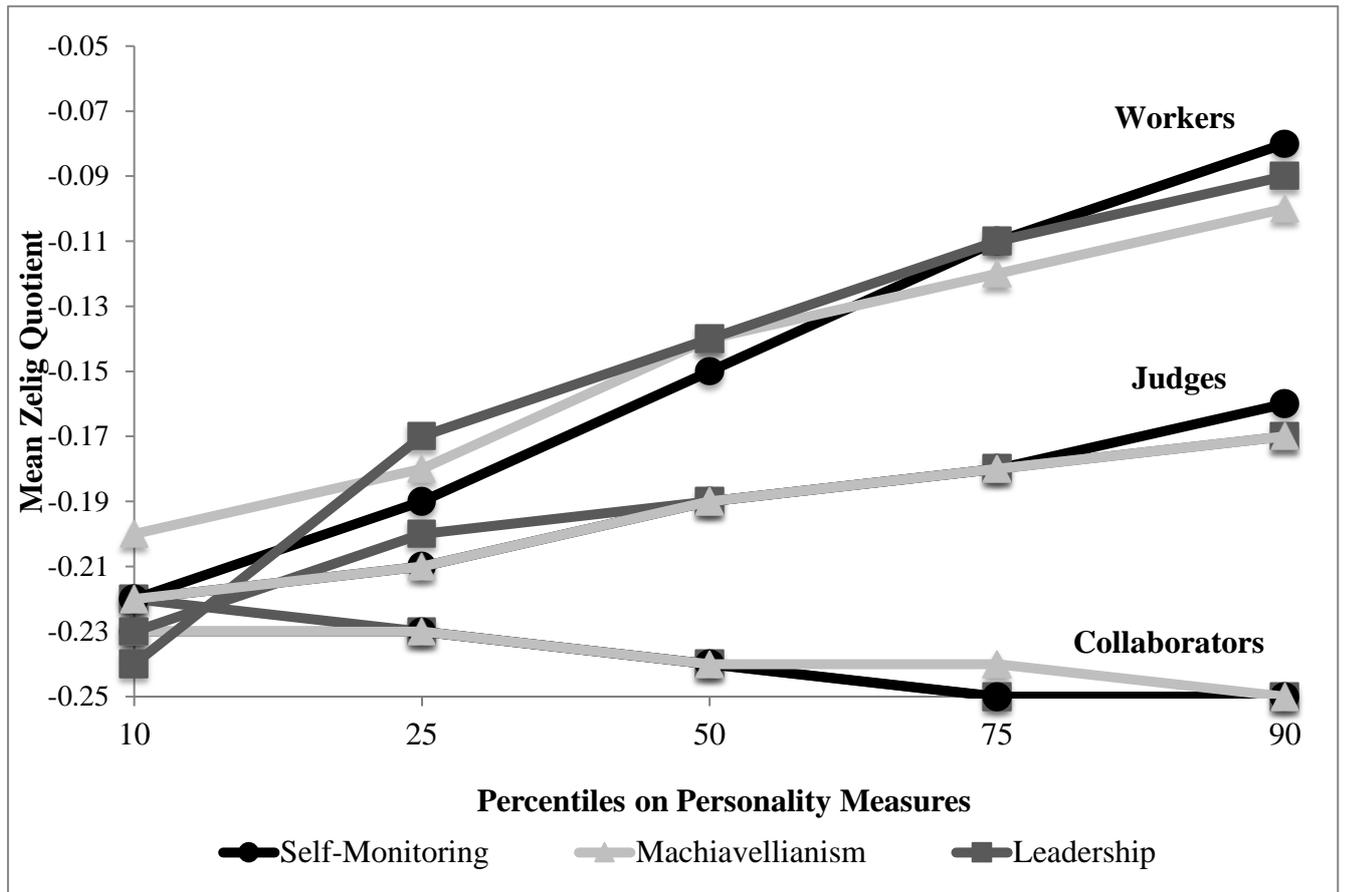
**Figure 1.** Pairwise speaker-to-recipient Zelig Quotient distributions for conversations between workers (low power) and judges (high power).



**Figure 2.** Pairwise speaker-to-recipient Zelig Quotient distributions for conversations between Group A and B Collaborators (neutral power).



**Figure 3.** Overall Zelig Quotients for Workers, Judges and Collaborators at percentiles of the self-consciousness, impression management, and agreeableness scales.



**Figure 4.** Overall Zelig Quotients for Workers, Judges and Collaborators at percentiles of the self-monitoring, Machiavellianism and leadership scales.