



Body movements of male and female speakers and their influence on perceptions of personality

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ABSTRACT

Men and women score differently on some personality traits and people's behavior reflects who they are. Therefore, males and females could be expected to express themselves differently on a behavioral level. To test this idea we turned the public performances of speakers (20 female and 20 male) into stick figure movies. Students of the University of Vienna ($n = 150$) rated these movies on scales measuring the Big Five personality traits. The participants experienced difficulties in ascribing the correct sex to the stick figures. Nevertheless, stick figures representing male speakers received higher ratings for extraversion and emotional stability than stick figure animations of female speakers. In addition, gender stereotypes seemed to influence the participants' ratings. Agreeableness, for instance, was preferably classified as female trait. In conclusion, our results suggest that body motion conveys social information, that men and women present themselves differently, and that people's judgments are influenced by gender stereotypes.

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1. Introduction

Several cross-cultural and meta-analytic investigations have been able to pin down gender differences in personality. It was found that men score more highly in traits related to assertiveness, risk-taking and openness to ideas. Women, on the other hand, had higher scores in extraversion, anxiety, trust, and tender-mindedness (Byrnes, Miller, & Schafer, 1999; Feingold, 1994). Moreover, gender differences in some personality traits were observed in early childhood, but also in samples of older adults (Chapman, Duberstein, Sörensen, & Lyness, 2007; Else-Quest, Hyde, Goldsmith, & Van Hulle, 2006). Studies based on the five factor model of personality led to similar conclusions by showing that across a great number of cultures women had higher scores in domains such as neuroticism, agreeableness, warmth and openness to feelings, whereas men had higher scores for some domains of extraversion (i.e. assertiveness and excitement seeking) and openness to ideas (Costa, Terracciano, & McCrae, 2001; McCrae et al., 2005). Using samples from 55 nations another study replicated these results but also found women to be more conscientious than men (Schmitt, Realo, Voracek, & Allik, 2008).

Evolutionary psychologists have proposed that such gender differences in personality are the result of natural and sexual selec-

tion. Males and females have faced different adaptive problems throughout the course of human evolution, which favored individuals who were able to adopt strategies leading to higher fitness gains (Buss, 1995; Michalski & Shackelford, 2010). Consequently, sex differences are expected to arise in those domains of behavior and cognition for which certain predispositions were advantageous. According to Trivers' (1972) theory of parental investment women invest more in their offspring than men and for this reason they should be cautious and nurturing. Meanwhile, men devote more resources to mating behaviors making them more prone to taking risks and striving for social dominance. Other theoretical conceptions come to the conclusion that the presence of individual differences matches the requirements of a human adaptive landscape. Broad categories of personality traits such as the Big Five may represent answers to the most important social dilemmas that humans had to solve. Further, individuals that drew inferences from other people's behavior and acted accordingly reproduced more successfully. Thus, variability with regard to certain character traits but also communicating and recognizing this variability might have been adaptive (Buss & Greiling, 1999; MacDonald, 1995).

In contrast to that, the social role model proposes that gender differences in ways of thinking, feeling and behaving are formed by socialization and cultural background (Eagly, 1987). Indeed, although the above mentioned cross cultural studies found similar patterns of gender differences across most nations, cultural variations were too pronounced to be neglected. Therefore, it seems that differences in male and female personality develop as a result of

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both biological mechanisms and their answers to the challenges imposed by living in a society. To explain how these processes interact several theoretical models have been proposed (for a review see Buss & Greiling, 1999; Wood & Eagly, 2002).

Regardless of how they arise, personality differences affect how individuals express themselves. Some researchers have provided evidence that people create and select their physical and social environments to match their dispositions, preferences, attitudes and self-views (Gosling, Jin Ko, Mannarelli, & Morris, 2002). Thus, to a certain degree, we provide the world around us with information that reflects who we are. This is in line with research showing that independent observers reach relatively high rates of consensus and accuracy in personality judgments, which are based on brief displays (i.e. ‘thin slices’) of a stranger’s behavior (Ambady, Bernieri, & Richeson, 2000; Borkenau, Mauer, Riemann, Spinath, & Angleitner, 2004). In other words, people are able to judge other people’s personalities by their appearance and their nonverbal behavior.

It has been reported that women are nonverbally more involved in interactions than men; they show more facial expressions and more expressive body movements. Men, on the other hand, show higher levels of activity, more expansive movements and more relaxation cues (Hall, 1984; Hall & Schmid Mast, 2008). Further, even simple animations of a body moving can betray someone’s sex. Researchers following the ‘point light’ approach, for instance, attached point lights and reflective markers to people’s major joints in order to trace their gait. This procedure created movies which presented someone’s movements as patterns of animated dots. Surprisingly, observers could ascribe the correct sex to these dot animations quite reliably. Detailed analysis and manipulations of such impoverished cues reveal that the rate of correct identifications depends on structural (e.g. hip–shoulder ratio) and kinematic features such as the frequency of certain movements (Barclay, Cutting, & Kozlowski, 1978; Kozlowski & Cutting, 1977; Pollick, Kay, Heim, & Stringer, 2005; Troje, 2002). Moreover, it has been shown that male and female dancers can be classified by their body motion and that gender-specific dancing behaviors are rated differently on scales measuring attractiveness (Grammer et al., 2003). In conclusion, all these findings suggest that men and women display different behaviors on the level of body motion.

Other studies in this field found different dancing patterns to covary with self-ratings on the personality dimensions of the five factor model (Bechinie & Grammer, 2003; Luck, Saarikallio, Burger, Thompson, & Toiviainen, 2010) and the motion behavior of politicians presenting themselves and their views to be connected to judgments of personality and health. The latter can even be used to predict voting behavior (Koppensteiner & Grammer, 2010; Kramer, Arend, & Ward, 2010). Consequently, nonverbal behavior encompasses more than facial expression. Motion behavior and its kinematic features also convey a great deal of social information.

The current study was grounded in both research on gender differences in personality and research analyzing the communicative value of body movements. Its aim was to show that observers are able to detect and ascribe meaning to the differences in male and female motion behavior. The stimuli we used were public performances of politicians, which we translated into animated stick figures. Similar to the ‘point light’ approach, which our method of behavior encoding is based on, this procedure diminished the influence of confounding variables such as the appearance of a person and made it impossible to recognize the speakers’ sex by their outward features. Building on the aforementioned studies on personality and body motion we arrived at three hypotheses. First, taking into account the evidence that men and women differ in their body movements, observers could be expected to identify

the actual ‘sex’ of our motion stimuli. Second, men and women attain different scores for some character traits and nonverbal behavior reflects who we are. Consequently, gender-specific motion behavior could be expected to convey gender differences in personality. Third, social judgments are influenced by gender stereotypes.

2. Method

2.1. Participants

For our rating experiment we recruited 150 people (75 female with a mean age of 22.3, $SD = 3.4$; and 75 male with a mean age of 23.7, $SD = 5.7$). The participants were students and senior students from different departments of the University of Vienna. They were approached at the ‘open’ areas of the University (where the students gather, wait or prepare work for their next course) and asked if they want to take part in a short rating experiment.

2.2. Stimulus preparation

The stimuli for this rating experiment were based on public speeches made in the German Houses of Parliament. Forty speeches (from 20 female and 20 male speakers) from a parliamentary session were prepared in chronological order for behavior encoding, and from these we randomly selected sequences with a length of 16 s. To capture the speakers’ body movements I developed a computer program (i.e. Speech Analyzer) that enables the user to run through a movie stepwise. Starting from the first picture (i.e. frame) of the randomly selected sequences, landmarks were positioned on different spots of a speaker’s body using the computer mouse. Dots were placed on the forehead, the hollow of the throat between the collar bones, the ears, the shoulders, the elbows, the hands, the corners of the lectern, and onto a spot in the middle of the body near the navel (i.e. the center of gravity). By rearranging the landmarks according to the amount the upper half of the body shifted between individual frames, the behavior of the speakers was recorded and stored in a time series of two-dimensional coordinates. In order to reduce the workload, every third frame only was encoded and the missing frames were filled in using linear interpolation (159 frames per clip). Using our software, we created stick figure movies which served as an abstract model of the politicians’ motion behavior (see Fig. 1). Stick figure animations were preferred to simple dot animations, because experiments done by Troje and Westhoff (2006) indicate that in simple point-light displays, missing information about the subject’s legs impairs the perception of a human body.

For our rating experiment, we developed a computer program which presents a randomly selected subset of the available stick figure movies. The questionnaire consisted of 20 items and was a brief German version of the NEO-FFI (Borkenau & Ostendorf, 1991). The underlying psychological constructs of this scale are extraversion, represented by, for instance, the item pair of reserved and outgoing (i.e. translation into English), agreeableness (e.g. hostile versus cooperative), conscientiousness (e.g. careless versus meticulous), neuroticism or emotional stability (e.g. nervous versus balanced) and openness (e.g. unimaginative versus imaginative). The items, which were based on a seven point Likert scale, were displayed to the right of the window in which the movie was shown. Slider controls were inserted between the pairs of adjectives, which enabled the participants to complete their ratings by dragging a bar to the right or to the left with a computer mouse. The position of the bar corresponded to the different levels of the Likert scale. In addition, we asked the participants to rate the sex of the stick figures.

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