

The influence of gestural configurations on the perception
of gender identity

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1. Table of Contents

Acknowledgements	i
1. Table of contents	iii
2. Abstract	v
3. Introduction	1
3.1 Literature review	4
3.1.1 An introduction to gestures	4
3.1.2 Gestures as semantic conduits	6
3.1.3 Social information perceived from gestures	10
3.1.4 Introduction to the concept of gender	16
3.1.5 Performing gender through nonverbal communication	19
3.1.6 Perceiving gender from nonverbal communication	22
3.1.7 Producing gender through gestures	24
3.1.8 Perceiving gender from gestures	26
3.1.9 The current study	27
4. Methodology	31
4.1 Design	31
4.2 Materials	34
4.2.1 Videos	34
4.2.2 Gestures	36
4.2.3 Online study	39
4.3 Participants	41
4.4 Procedure	41
4.5 Analysis	42
5. Results	43
6. Discussion	47

6.1. Preliminary analysis	47
6.1.1 Theoretical explanations	47
6.1.2 Potential stimulus issues	51
6.2. Inverse composite analysis	57
6.3 General discussion	62
6.3.1 Implications	64
6.3.2 Future research	66
7. Conclusion	67
8. References	69
Appendices	77

2. Abstract

Gestures are bodily communicative actions, typically involving movements of the hands and arms, which are synchronous with speech and co-expressive but not redundant (McNeill, 2007: 23).

Traditionally, gestures have been seen as a conduit for semantic information (Cassell, McNeill & McCullough, 1999). However, some work has investigated the social information conveyed by gestures, either as a result of semantic mismatches (Beattie & Sale, 2012) or in the absence of semantic information (e.g. Rule & Ambady, 2008; Bailey & Kelly, 2015). For instance, Rekers and Rudy (1978) have suggested that aspects of gender identity are also conveyed through gesticulations, though their work did not actually investigate perception of this identity expression by interlocutors. Those who have investigated perceptions of gender identity (e.g. Birdwhistell, 1970; Frieze & Ramsey 1976) looked more generally at nonverbal behaviour without controlling for the precise contribution of individual communicative modes.

With the above in mind, current study will attempt to answer the following question: how do differences in hand-shape and gestural space configurations affect social judgements about gender identity made by individuals? A social judgement task was created using 20 items from the Bem Sex Role Inventory (Bem, 1974), to which 120 participants responded on a five-point Likert scale to various adjectival descriptors. The study used a between-subjects design, so participants watched only one of four stimulus videos: a mock advertisement enacted by a male or female using masculine gestures, or a male or female using feminine gestures.

Independent t-tests based on the scores of ten items per condition found that the only significant result was that the female-feminine gesture condition was more feminine than the female-masculine condition. However, no significant differences were found between the male conditions for either the masculine or feminine scores, and no significant difference was found for the masculinity scores when comparing the female conditions.

A secondary analysis combined the scores of all 20 items, and found that the male-masculine condition and the female-masculine condition were perceived as significantly more

masculine than their same-sex feminine-gesture counterparts. The female-feminine condition and male-feminine condition were both perceived as significantly more feminine than their same-sex masculine-gesture counterparts.

The results suggest that interlocutors do indeed glean social information from structural variation in gesticulations. Thus, co-speech gestures should not simply be conceptualised as contributing semantic information to verbal output. Rather, they have a demonstrable influence in the perception of identity – specifically, gender identity

3. Introduction

Gestures are salient within the human multimodal communication system, as an abundance of studies have demonstrated that gestures are semantic conduits (e.g. Cassell, McNeill & McCullough, 1999). Furthermore, some research has found that social information can be perceived from gestures (Beattie & Sale, 2012), but this field has received far less attention, with most social perception studies focussing on nonverbal communication as a whole mode (e.g. Ambady, Hallahan, & Conner, 1999). It has been suggested that gestures can convey social information about gender identity, as sex differences have been identified in the production of gestures (Rekers & Rudy, 1978), however, few studies have directly investigated this. The aim of the present study is to investigate how gestural configurations influence social perceptions about gender identity. This study takes an ecological view of social perception, which assumes the position that participants perceive information from dynamic and physical events in the form of multimodal stimuli (McArthur & Baron, 1983: 215). The ecological perspective puts emphasis on the intrinsic connection between the performance of bodily behaviours and the perception of social information, stating that stimulus information in facial expressions, voice, and gestures communicate intentions, emotions, and other more stable qualities (McArthur & Baron, 1983). The results of this study may help to elucidate the connection between the articulation of gestures and the perception of an actor's gender identity.

This topic pertains to the wider field of nonverbal communication, which is a salient field in linguistics as nonverbal communication has been said to contribute the majority of the social information within an interaction (Baglan & Nelson, 1982: 29). This study focuses on gestures in particular, in order to pinpoint a specific material manifestation of the perceptions of individuals, which previous studies into general nonverbal communication have not contributed. Gestures have been found to be highly informative in interactions. Traditional

studies regarded gestures as semantic conduits (Beattie & Shovelton, 1999; 2005; Cassell, McNeill, & McCullough, 1999), which could be perceived and integrated to create a more robust interpretation of an utterance. Other studies have investigated the social information that gestures can convey, such as likability and trustworthiness (Beattie & Sale, 2012), but gestures have received arguably less attention in this area, because the focus has tended to rest on the social information that can be perceived from nonverbal communication as a whole mode (Ambady, Hallahan, & Conner, 1999). Evidently, more research needs to be performed to investigate the perception of social information from gestures.

This study also situates itself within the ever-growing body of research into gender; whilst there has been much research into gender, studies have primarily focused on an individual's construction of their own gender, rather than the perception of another individual's gender. A multitude of studies have identified sex differences in the production of nonverbal communication, such as the observation that men typically use more open postures and expand into wider personal spaces, whilst women employ closed postures and utilise small personal spaces (Henley, 1977; Frieze & Ramsey, 1976). By contrast, this thesis focuses on whether individuals perceive gender identity from the gestures that are enacted by an individual. Previous gender studies have typically investigated gender as a concept which is congruent with sex norms, associating only men with masculinity and only women with femininity. However, more recent perspectives dissociate biological sex and gender identity; for this reason, this thesis also gains insight into how behaviours which deviate from sex norms are perceived.

The literature has demonstrated that there is a clear link between gender and nonverbal communication; however, most of this research involves qualitative analyses based on the production of gender through nonverbal communication. There is far less research into individuals' perception of gender identity: some studies have investigated this topic, but have

used stimuli containing multiple areas of nonverbal communication (e.g. Birdwhistell, 1970; Johnson, Gill, Reichman, & Tassinary, 2007; Kozlowski, Brooks, & van der Zwan, 2016). Therefore, few studies have investigated the influence of a specific type of nonverbal communication on the perception of gender identity. Whilst it has been established that gestures are highly communicative in terms of semantic information and some aspects of social information, it is unknown whether structural variation in gestures will influence the perception of gender identity. For this reason, the research question of this study is: *how do differences in hand-shape and gestural space configurations affect social judgements about gender identity made by individuals?*

It is hypothesised that hand-shape and gestural space will motivate the judgement of gender identity in participants' social judgement ratings. This hypothesis will be tested empirically using a social judgement task, which participants will complete after watching a short mock advertisement in which the gestural information indexes gender identity. The term *gender* is operationalised here as *masculinity* and *femininity*. Masculine gestures and feminine gestures were derived from the abundance of literature which has identified differences in gesture use between the sexes, and from a qualitative analysis of male-oriented and female-oriented advertisements. Only the gestures differed across conditions, and the rest of the verbal and nonverbal information was controlled for to be as gender-neutral as possible. This study uses a between-subjects design, in which there will be four conditions with 30 mixed-sex participants in each. This design is used because it is unreasonable to ask participants to make separate social judgements about the same actor that they have seen twice (Beattie & Sale, 2012). There are two conditions in which sex and gender information are congruent: male-masculine (a male actor using masculine gestures), and female-feminine (a female actor using feminine gestures). The other two conditions involve gestures which display gender information which is incongruent with the actor's biological sex: male-feminine (a male actor

using feminine gestures), and female-masculine (a female actor using masculine gestures). After watching a stimulus video, participants in each condition will complete a social judgement task in which they respond to statements about the actor's personality traits. These characteristics were taken from the Bem Sex Role Inventory (Bem, 1974) as this correlates personality traits with masculinity and femininity. This method is appropriate to answer the research question, as the overall ratings given by participants will provide insight into their judgements of a person based on the differing gestural configurations.

The results of this study demonstrated that participants could perceive an individual's gender identity based on the social information conveyed by gestures, as significant differences were found between conditions when using a composite variable analysis. This suggests that gesture is a highly informative type of nonverbal communication with regard to gender identity, which has implications for future research into nonverbal communication and also has real-life applications.

3.1 Literature review

3.1.1 An introduction to gestures

Humans have evolved to have an upright posture, which allows for the use of the torso, the arms and the hands, as well as the vocal tract in communication (Levinson & Holler, 2014: 1). Gestures are bodily behaviours, prototypically involving movements of the hands and arms, which McNeill (2007: 23) defines as synchronous with speech and co-expressive but not redundant. This means that the same underlying concept is presented by a speaker in the verbal channel and the gestural channel simultaneously, but that this semantic unit is expressed in different ways (McNeill 2007: 23). There may be a lexical affiliate (Schegloff, 1984, in McNeill, 2007: 37), which is the lexical item which is most closely related to a gesture in meaning, or the gesture can correspond to a whole phrase or utterance.

Seyfeddinipur (2011: 3 - 5) defines gestures as semantic entities which can encode information about the size, shape, or motion of an object, whilst also conveying the pragmatics of an utterance and its intended interpretation. This further expands upon McNeill's (2007) definition by exemplifying the non-redundancy of the semantic information gestures carry: the gestures can in fact contribute information which is not contained in the speech to elucidate the specifics of an utterance.

The use of a multimodal communication system persists throughout life, as children's gestural use increases during their linguistic development, and adults utilise gestures alongside most clauses (McNeill, 1992, in Levinson & Holler, 2014: 6). Therefore, it has been said that gestures and speech form one unit with an unbreakable bond (McNeill, 2007: 24), and there is much evidence which supports this. For example, during delayed auditory feedback, a speaker's own speech is played back to them after a small delay, and this negatively affects speech by causing hesitancy and a reduction of speed; despite this, the gestures and speech remain synchronised (McNeill, 2007: 25). Furthermore, congenitally blind speakers have been found to gesture as frequently as sighted subjects do (Iverson & Goldin-Meadow, 1997, in McNeill, 2007: 26); the lack of ability to acquire gestures visually does not impede the production of gestures in blind people. Therefore, it appears that in the context of natural communication, gesture and language are inextricably linked.

Kendon (1972, in McNeill, 2007: 31) discussed the temporal anatomy of gestures. Gesture phases are the different parts that contribute to a gesture; Beattie and Shovelton (2005: 22) note that, of Kendon's (1972) five phases, a prototypical gesture will consist of a preparation phase, a stroke phase, and a retraction. A preparation phase is optional, and involves the arms moving into the gestural space, away from the resting position (McNeill, 2007: 31). A stroke phase is obligatory, and constitutes the semantically meaningful element of the gesture (McNeill, 2007: 32). Finally, a retraction is an optional phase and involves the

limbs moving from the gestural space back to the resting position. These phases make up a gesture phrase, which become gesture units: the overall movement between the successive rests of the limbs (Kendon, 1972, in McNeill, 2007: 31).

McNeill (2007: 41) disagreed with attempts to categorise gestures as one of four types; instead, he claimed that there are four dimensions of gestures which include the semiotic properties: iconicity, metaphoricity, deixis, and temporal highlighting. Gestures are multifaceted and a given gesture can combine any of those features, rather than only belonging to one of the categories (McNeill, 2007: 41). Iconic gestures represent concrete entities by embodying the semantic content in an imagistic manner; alternatively, metaphoric gestures convey an abstract image or concept (McNeill, 2007: 39). Apart from that, deictic gestures locate entities in space, for example by pointing (McNeill, 2007: 39). Lastly, temporal highlighting gestures are gestures which mirror the rhythm of the speech by moving the hand back and forth, or upwards and downwards (McNeill, 2007: 40).

Another feature of gestures is that they have a cultural element: both the shape and the meaning of gestures are culturally created and instantiated (Birdwhistell, 1970: 79). Goldin-Meadow (1999: 419) notes that because gestures are found cross-culturally, across age groups and across situations, this form of communication can be used as a research tool to elucidate the interlocutor's unspoken thoughts. This is due to the fact that gestures contain information that is not always the same as that carried by speech (Goldin-Meadow, 1999:419) and due to the idiosyncratic nature of gestures (Goldin-Meadow, 2000: 237). Therefore, gestures have been informative in multimodal communication research.

3.1.2 Gestures as semantic conduits

Traditionally, gestures have been studied in regard to the semantic information that they convey, and their co-expressive contribution to the semantics of the verbal channel. Previous

to Beattie and Shovelton's (1999) empirical study, much of the literature on the simultaneous contribution of gesture and speech to semantics had been purely theoretical and based on assertions of the analyst. Beattie and Shovelton (1999: 11) asked 14 participants to retell a cartoon; the narrations including iconic gestures were then presented to two new groups of 30 participants: one condition only had access to the audio channel, whilst the other condition received audiovisual stimuli. The participants then had to answer 68 forced-choice, yes/no questions which were based on the semantic features that were iconically acted out in the gestures: for example, the shape or size of an object (Beattie & Shovelton, 1999: 14 - 16). The results revealed that the participants who were able to see the gestures obtained significantly more information from the stimulus, as they answered more questions correctly (Beattie & Shovelton, 1999: 16). This suggested that iconic gestures do contribute to the overall semantic meaning of an utterance.

Further evidence demonstrating that gestures contribute to a more robust understanding of a semantic message was obtained in Beattie and Shovelton (2005), using the context of advertisements. Participants were exposed to one of three conditions (n = 50 per condition): a written newspaper advert, an audio-only condition which which mimicked a radio advertisement, or an audio-visual condition which replicated typical television advertisements and contained six iconic gestures per video (Beattie & Shovelton, 2005: 24). Subsequently, participants answered multiple-choice questions which related to the manner, size, or speed of the advertised product; the answers to 12 questions were contained in either gesture or speech, and six answers were found in both gesture and speech (Beattie & Shovelton, 2005: 24). The results demonstrated that participants in the television condition answered significantly more questions correctly than in the radio or text conditions, suggesting that gestures contributed to the participants' comprehension of the semantics of the advertisement (Beattie & Shovelton, 2005: 24). They also quantified the effectiveness of the

gestures, finding that participants received 10% more semantic information in the audiovisual condition than in the audio-only condition, and 9.2% more information than in the text-only condition (Beattie & Shovelton, 2005: 24). From these two studies, it is clear that the semantic information conveyed by gestures is perceived and integrated by participants, which informs a more robust interpretation of an utterance or message.

Whilst Beattie and Shovelton (1999) investigated the complementary nature of gestures, the communicative contribution of gestures has also been investigated in terms of whether gestural information which conflicts with the semantics of the verbal channel is perceived and integrated by participants. For instance, Cassell, McNeill, and McCullough (1999: 8) investigated whether the information carried by co-speech gestures was attended to by participants, by testing the nature of comprehension in the context of a cross-modal semantic mismatch. The authors (1999: 9 - 11) created gestures which had the following relationships to the verbal channel: anaphor (referent) mismatch, origo (perspective) mismatch, or additional manner information (non-redundant information about the performance of an action). One participant group (n = 8) watched the researchers' retelling of a cartoon, which either contained semantically matching gestures or semantically mismatching gestures (Cassell et al., 1999: 12). The participants were then instructed to retell the story to another group (n = 8), and blind coders judged their accuracy and estimated whether any inaccuracies originated from the match or mismatch condition. Cassell et al.'s (1999: 18) results showed that 40% of the speech-gesture mismatches (anaphor and origo) caused retelling inaccuracies, demonstrating that semantic mismatches are attended to, and gestural information is combined with that of the verbal channel. Furthermore, 54% of the manner gestures provoked inaccuracies, which confirmed that information from gestures which does not contradict that of the verbal channel is also integrated (Cassell et al., 1999: 20). This research is important as

it elucidates that when mental representations are constructed by listeners, the relationship between gesture and speech is taken into account (Cassell et al., 1999: 28). Whilst the methodology of this study is very thorough through the use of blind coders to reduce bias, there is one issue with the authors' conclusions from the results. The authors concluded that the study demonstrated the participants' real-time perception of co-expressive gestures, however, in reality, the results only showed that inaccuracies were present in the retellings, which could have been due to numerous factors. It was assumed that the inaccuracies were caused by the perception and integration of mismatching gestural information, but a theoretical gap between the results and the conclusion does exist.

However, much of the research into the integration of gestural information focused on iconic gestures, which is only one subset of McNeill's (2007) gesture dimensions. Beattie and Sale (2012: 79), alternatively, argued that metaphoric gestures may not be combined with the verbal channel to the same extent, as the abstract nature of the concept conveyed by the gestures would be more difficult to interpret than in iconic gestures. Similar to Cassell et al.'s (1999) study, Beattie and Sale (2012) used a mismatch paradigm to investigate whether participants integrated the semantics from metaphoric gestures with the information in the co-expressive speech. For the semantic communication task, the researchers created scripts related to relationships, student debt, and work, containing choreographed metaphoric gestures (Beattie & Sale, 2012: 85). One group of participants ($n = 33$) were shown videos in which the speech and gestures matched, and the other group ($n = 24$) participated in a mismatch condition (Beattie & Sale, 2012: 87). The participants then performed a semantic judgement task in which they rated the messages on a five-point Likert scale (Beattie & Sale, 2012: 86). Beattie and Sale's (2012: 88) results showed that half of the messages gave statistically significant results which demonstrated that metaphoric gesture-speech mismatches affected the interpretation of the utterance, even when the semantic information

in the two channels conflicted. One issue with this study is that the results for the relationships script were either not significant, or were significant in the opposite direction to the authors' expectations, which could decrease the reliability of the conclusion that even semantic mismatches were integrated. Beattie and Sale (2012: 90) reasoned that the actor's delivery of the message could have influenced the results, but they concluded that the chosen metaphoric gestures were not actually appropriate for that particular message due to the possibility of different semantic interpretations. Despite this, the authors conclude that obtaining six significant results which support their hypothesis was highly significant ($p < 0.001$), demonstrating that semantic information is integrated into the semantic interpretation of a message, even in the presence of a cross-channel semantic mismatch (Beattie & Sale, 2012: 89).

Therefore, it is clear that gestures are incredibly salient within communication, and can contribute to the semantic meaning of a message regardless of whether they are co-expressive or conflicting with the speech. Whilst the discussed studies are highly informative about the perception and integration of the semantic information conveyed by gestures, the results are limited to this topic and neglect to consider other types of information that may be attended to when viewing gestures.

3.1.3 Social information perceived from gestures

More recently, some studies have shown that participants can not only perceive the semantic information conveyed by gestures, but this semantic information can also affect the social judgements of the interlocutors. Baglan and Nelson (1982: 29) posited that nonverbal communication can convey the majority of the social meaning of an utterance. This is evidenced by Birdwhistell (1970), and the finding that the nonverbal channel more accurately expresses emotions (Davitz, 1967, in Baglan & Nelson, 1982: 29). Nonverbal behaviours

have been found to indicate characteristics such as dominance, or emotional warmth, which have independently been linked to men and women respectively (Frieze & Ramsey, 1976). Frieze and Ramsey (1976: 133) claim that these features can be indexed by the position of the body, the location of the body in space, facial expressions, and vocal tones.

Beattie and Sale (2012: 91) had established that gesture-speech mismatches affected the perception of the underlying message but believed that there was a possibility that the presence of such cross-modal semantic mismatches would affect the social perception of the speaker. For example, gesture-speech semantic mismatches have been found to signal cognitive instability (Goldin-Meadow, 1999: 424), but there was little empirical evidence into what social information individuals could glean from gestures. Beattie and Sale's (2012: 91) stimuli consisted of videos of a female actor speaking about relationships: in one condition, the five metaphoric gestures matched the semantics of the speech; in the second condition the gestures mismatched the speech. After watching the video, the 20 participants in each condition completed a 7-point Likert scale questionnaire in which they rated how much they liked the actor, and how confident they were in the actor's message (Beattie & Sale, 2012: 93). The results showed that when the semantics of the gestural and verbal channels mismatched, the speaker was rated as significantly less likeable ($p < 0.002$) and participants were significantly less confident in the speaker's message ($p < 0.005$) (Beattie & Sale, 2012: 94). The researchers (2012: 96) noted that the stimuli may not have wholly mirrored naturalistic conversation, as the videos were formulated so that all of the gestures in one condition either matched or mismatched. Whilst it is true that this study focused on the semantic information conveyed by gestures, it clearly demonstrates that the co-articulation of gestures and the semantic mismatch of the verbal and gestural modes motivated the social judgements that the participants made, as only the gestures differed across conditions. However, it is possible that social information can be perceived from gestures without the

presence of a semantic mismatch between the verbal and nonverbal channels. Thus, this thesis study removes the semantic variable, and specifically manipulates the articulation of the gestures themselves to see if the effect on participants' social judgements is still observed.

Within the same field, researchers have directly investigated the social perceptions originating from nonverbal behaviour as a whole embodied mode. Ambady, Hallahan and Conner (1999) explored participants' accuracy at judging actors' sexual orientations based on the nonverbal behaviour present in still images, one-second videos, and ten-second videos. Only the social information conveyed by nonverbal behaviour was investigated in this study: as Ambady et al. (1999) used silent video clips, there could be no semantic match or mismatch of the nonverbal behaviour and the verbal channel. The stimulus videos were created by separately recording 25 graduate students - heterosexual and homosexual males and females - as they responded to a prompt sentence (Ambady et al., 1999: 541). Then, the videos were edited to the two desired lengths, and eight still photographs were created using frozen frames from the recordings (Ambady et al., 1999: 541). A group of 96 students of mixed sex and sexual orientation were split into three balanced groups, and judged the stimuli of either one of the video conditions or the image condition, rating the targets as either homosexual or heterosexual along a 7-point Likert scale (Ambady et al., 1999: 541). The results showed that the visual components of nonverbal behaviour affected the participants' judgements of sexual orientation, as in each condition, gay men and lesbian targets were perceived to be more homosexual than the heterosexual targets (Ambady et al., 1999: 541). Furthermore, accuracy was significantly greater in the ten-second clip, suggesting that the amount of nonverbal behaviour and movement that the participants saw affected their accuracy (Ambady et al., 1999: 541). For this reason, this thesis study used video stimuli of approximately 30 seconds in length in order to allow for a greater accuracy of the

participants' judgements; this was especially appropriate considering that the participants had more questions to answer than in Ambady et al.'s (1999) study.

Furthermore, Bailey and Kelly (2015) investigated how the perception of status (referred to as "V") is influenced by body pose, involving elements of the whole body, and the sex of the actor. Participants were primed with either a male or female target performing either a dominant or submissive pose and then had to classify target words as dominant (high V) or submissive (low V) (Bailey & Kelly, 2015: 317). This study found that pose was highly informative for correct word identification with female targets for both high V and low V words. However, it appeared that pose did not have the same strong influence for male targets in the context of submissive posing. Whilst it was found that the targets who were female and enacted low-V posing facilitated the expected classification of submissive, low-power target words, the same did not hold when classifying words after exposure to male submissive posing (Bailey & Kelly, 2015). Even when males performed submissive body postures, there were more errors when classifying low V words, which the authors conclude means that participants were less inclined to associate men with lower status (Bailey & Kelly, 2015: 330). Alternatively, females performing dominant or submissive poses facilitated the classification of high V and low V words respectively, suggesting that participants were able to associate women with both high and low status, based on their body pose (Bailey & Kelly, 2015: 329). Overall, the authors concluded that pose was more important than the actor's sex when perceiving status, as both types of pose affected word classification in females, and high V posing in males facilitated the classification of high V words (Bailey & Kelly, 2015: 332). This study clearly demonstrates the importance of nonverbal communication in perception, as body pose affected status, but it also suggests that there is interplay between sex and status.

Other research has taken a less general approach to nonverbal communication, and has looked at the social perceptions that originate from specific elements of nonverbal behaviour.

Rule and Ambady (2008: 1) investigated whether social perceptions of male sexuality were influenced by static facial cues. The study used a between-subjects design as 90 participants were assigned to six conditions based on how long they would be exposed to a photograph; the exposure times were: 33ms, 50ms, 100ms, 6500ms, 10,000ms, or a self-paced judgement task (Rule & Ambady, 2008: 2). Participants had to indicate the target's sexuality as either heterosexual or homosexual by pressing a key (Rule & Ambady, 2008: 2). The results revealed that male sexual orientation could be perceived with an accuracy significantly greater than chance in all conditions apart from the 33ms condition (Rule & Ambady, 2008: 2). The authors concluded that male sexual orientation could be accurately perceived from facial cues with as little exposure as 50ms (Rule & Ambady, 2008: 5).

Rule, Ambady, Adams, and Macrae (2008: 1019) similarly investigated how facial cues influenced judgements of male sexual orientation. In the first study, 23 participants judged 81 static images of homosexual and heterosexual males' faces along a four-point scale from "very gay" to "very straight" (Rule et al., 2008: 1020). The facial cues provided enough information for participants to make significantly accurate judgements about the targets' sexuality (Rule et al., 2008: 1021). To further specify which facial features contributed to the social judgements, Rule et al. (2008: 1021) performed a second experiment in which the images were manipulated in four ways, so the participants viewed: the unaltered image, the image with the hair removed, the image with the mouth hidden, and the image with the eyes and eyebrows removed. The 29 participants made their judgements along the same rating scale as in the first study. The results showed that, even with the removal of one facial feature, the participants' judgements were still significantly accurate than chance ($p < 0.05$); therefore, multiple features simultaneously contributed to the social evaluations (Rule et al., 2008:

1022). To clarify the salience of each feature, in a third experiment, the stimuli only involved one of the above facial features, and participants had to rate the photos on a seven-point scale from “very gay” to “very straight” (Rule et al., 2008: 1022). Accuracy was significantly better than chance ($p < 0.05$) in the hair-only, mouth-only, and eyes-only conditions, but accuracy was not significantly better than chance when all three features were removed (Rule et al., 2008: 1022). This suggests that judgements about male sexuality can be made from minimal information involving only one facial feature, but all facial cues significantly contributed to these judgements (Rule et al., 2008: 1022). Therefore, social judgements can be informed by information in the nonverbal channel.

The Likert scale questions in this thesis methodology differ from those in the studies investigating sexual orientation (Ambady et al., 1999; Rule & Ambady, 2008; Rule et al., 2008), as participants were not directly asked to give their judgement about whether the actor is masculine or feminine. Instead, the participants answer questions about personality traits which have been previously linked to either males or females, to hide the study’s aims and reduce the risk of biasing the results.

The discussed studies clearly demonstrate that social perceptions can be motivated by nonverbal communication as a whole, or more specific elements of behaviour. These evaluations can be affected by the coherence of the semantics of the verbal mode and gestures (Beattie & Sale, 2012), or can be made as a direct evaluation of the bodily behaviour (Ambady et al., 1999; Rule & Ambady, 2008; Rule et al., 2008). However, none of the studies in this section investigated whether the actual articulation of gestures could convey social information. This thesis study aims to specifically investigate one element of the nonverbal mode by exploring how gestures which differ in hand-shape and gestural space can affect individuals’ perceptions of one element of social identity: gender.

3.1.4 Introduction to the concept of gender

One feature of social identity which has received considerable attention is gender. Under the recent perspective, gender identity must be defined separately from sex. Butler (1998: 528) describes sex as a discrete category which is derived from primary sexual characteristics; Bailey and Kelly (2015: 318) expand upon this by saying that it is the “chromosomal, hormonal and phenotypical differences” which biologically determine sex. Gender, contrastively, has been defined as something which is not necessarily stable, it is tenuous and constituted in context and time (Butler, 1998: 519), and thus gender is socially constructed (Bailey and Kelly, 2015: 318). Hall and La France (2012) say that gender exists as a category on societal and historical levels, and Velding (2017: 511) states that people acquire gender traits influenced by psychological, social, and cultural factors.

Gender identity is a “socio-psychological concept” (Mandal & Jakubowski, 2015: 6) which involves an individual’s affiliation with culturally influenced concepts of masculinity and femininity. Definitions of masculinity and femininity vary. Mehta and Dementieva (2017: 604) describe masculinity and femininity as variable states which are context-dependent. Hegemonic masculinity is thought to be the most reinforced masculinity in society (Connell, 1995, in Hall & La France, 2012: 38): this definition of masculinity deems implies homophobia, derogatory attitudes towards women, and heteronormativity (Connell, 1995, in Schippers 2007: 87). This is said to be the most prevalent form of masculinity, though it has been suggested that there are multiple versions of masculinity (Hall & La France 2012: 38). As gender does not have a one-to-one mapping with biological sex, both sexes can participate in masculine practices, with varying cultural and societal effects (Connell, 1995, in Schippers 2007: 86). On the other side of the gender spectrum is hegemonic femininity, which is less strictly defined: Schippers (2007: 94) simply describes it as womanly characteristics that are in a complementary relationship to those features of hegemonic masculinity. The

consequences of hegemonic femininity are the continued subordination of women (Schippers, 2007: 94), as femininity implies a lack of control, powerlessness, and passivity (Bordo, 1993, in Velding, 2017: 510).

Whilst gender is traditionally defined as an aspect of the conception of the self, the cognitive perspective argues that it is a framework which individuals can utilise to engage in their social environment, and to understand or find coherence in the behaviours or thoughts of others (Cross & Markus, 1993: 56 - 77). The gender schema provides expectations for how another individual might behave, based on, for example, sex differences (Cross & Markus, 1993: 69). Gender is one of the earliest social categories to be acquired by children (Kohlberg, 1966, in Cross & Markus, 1993: 58), and sex-based expectations are also instantiated early in life; Kagan (1964, in Parish & Powell, 1980: 457) states that children of preschool age are proficient at recognising differences between sexes.

Subsequently, by creating and highlighting differences and distinctions between men and women, gender inequalities are produced (Velding, 2017: 511). Due to the amplification of sex differences over time within a culture (Cross & Markus, 1993: 56), these behavioural expectations may become gender stereotypes, where certain features are ascribed to each sex by a society (Broverman, Vogel, Broverman, Clarkson, & Rosenkrantz, 1972: 75). These gender stereotypes become highly prescriptive: not only are the qualities ascribed to men and women, but they are actually required to fulfil this characteristic (Prentice & Carranza, 2002: 269). Prentice and Carranza (2002: 269) give the example of the stereotypical belief that women are caring, which creates a prescription in society that women should be so. Prentice and Carranza (2002: 271) note, however, that there are also proscriptions: traits ascribed to a sex that are low in social desirability. Hall and La France (2012: 37) describe the process of self-categorisation, in which individuals conform to these gender prescriptions and avoid the proscriptions to abide by normative social behaviour. It is clear that gender stereotypes

regulate an individual's own behaviour as they quickly learn which behaviours are deemed appropriate for them, and also expected of them.

This sense of gender-appropriate behaviour relates to gender typing, which occurs through the identification of other people as “masculine” or “feminine” through both the verbal channel and the behavioural channel (Waters & Ellis, 1996). Individuals are said to use subjective scaling (Biernat, Manis, & Nelson, 1991, in Cross & Markus, 1993: 64), in which men's and women's behaviours are evaluated by different scales with different expectations, so an equivalent behaviour across sexes may be perceived differently. This can result in attributes which are positively correlated with one sex being interpreted as abnormal or inappropriate when identified in the other sex (Waters & Ellis, 1996). Bartol and Butterfield (1976, in Remland, Jacobson, & Jones, 1983: 24) found that if men or women performed leadership behaviours which were deemed inappropriate or unexpected for their sex, then they would be rated more poorly by colleagues. The performance of dominant behaviours by women, or submissive behaviours by men are examples of sex-role violations (Remland, Jacobson & Jones, 1983: 25). Heilman, Wallen, Fuchs, and Tamkins (2004: 426) state that women can face discrimination when performing masculine behaviours, as a result of societal gender typing. In an empirical study, Baglan and Nelson (1982) investigated how people perceive certain behaviours as inappropriate for a certain sex, arguing that these perceptions could affect an individual's judgement of the social actor. In their (1982) study, a mixed group of 298 students read the descriptions of nonverbal behaviours in the context of interactions between participants of mixed-sex and mixed status, and rated the appropriateness of the behaviour on a seven-point Likert scale. Significant sex differences were found in the behavioural domains of gestures, personal space, laughter, and posture (Baglan and Nelson, 1982: 36). For example, males leaning back in a chair with their feet on the desk was seen as

significantly more acceptable than it was for women, whilst it was seen as significantly more appropriate for women to make a beckoning gesture than it was for men (Baglan & Nelson, 1982: 35). Gender norms are acquired early in life, which develops the capacity to sex type. Not only do children recognise sex differences, but they may even criticise sex-inappropriate behaviour in others (Bem, 1989, in Cross & Markus, 1993: 58), demonstrating the pervasiveness of stereotypes and expectations in society.

As the works discussed above show, gender is clearly a salient concept within society. Research has demonstrated that gender has obvious links to nonverbal communication and behaviour: there are gender stereotypes which dictate which behaviours each sex should undertake, and people may face criticism if they deviate from this.

3.1.5 Performing gender through nonverbal communication

Research has demonstrated that various elements of nonverbal behaviour are indicative of gender stereotypes. It has been claimed that gender identity is constantly constructed and reconstructed by a repeated stylisation of the body through gestures and other movements (Butler, 1988: 519). Moreover, Birdwhistell (1970: 40) states that human gender behaviours are not qualitatively different from those in the animal kingdom, where patterns of behaviour in context are seen to construct and display gender. The behaviours are tertiary sexual characteristics, which are unrelated to physiology, but are instead learned and situationally instantiated by social actors (Birdwhistell, 1970: 40).

Differences between the sexes in the production of nonverbal communication have been well established in anthropological and theoretical literature, and whilst the observations in these papers are salient, they lack empirical studies to fortify the theories. Henley (1997) argues that nonverbal communication has majorly influenced the definition of femininity, and thus women's demeanour, territory, and personal space must be spatially restricted. It has

been observed that women condense themselves through their bodily movements to take up minimal space (Pierce, 1973: 438, in Henley 1977: 38). Henley (1977: 142) argues that much of women's interaction is conditioned by "kinesic prescriptions" such as keeping their arms folded and legs crossed, so it is important to dedicate attention to the gestures and postures employed in their nonverbal communication. It has been argued that women's utilisation of smaller zones of personal space reflects and reifies their lower status in society (Liebman, 1970, in Frieze & Ramsey, 1976: 135), which can be abstracted as a feature of femininity.

Conversely, it has been observed that postures involving spreading the legs and occupying more space were typically used by males and expressed dominance, which can then be characterised as an attribute of masculinity (Hewed, 1957, in Frieze & Ramsey 1976: 136). This finding has been replicated by other studies of humans by researchers such as Pierce (1973: 438, in Henley 1977: 38). There is also evidence of such behaviours in the animal kingdom, such as peacocks fanning their tail feathers, or chimpanzees expanding their chests to demonstrate dominance (Darwin, 1872, in Carney, Cuddy, and Yap, 2015: 1363). There is also concrete evidence from neuro-endocrinology which demonstrates the relationship between open postures and dominance. The typical hormone profile of a power holder or leader involves high testosterone and low cortisol levels (Carney et al., 2015: 1364); in the animal kingdom, this organism would be described as the "alpha male". Testosterone is an androgen which develops and maintains masculine features in organisms (Mazur & Booth, 1998: 354), and is therefore highly linked with males and masculinity. A rise in testosterone causes an increase in behaviours which signify dominance (Carney et al., 2015: 1363), and as testosterone is typically higher in males (Mazur & Booth, 1998), there appears to be a biological reason behind the higher frequency of open postures in males. Furthermore, the performance of dominant body poses such as expansiveness and openness has been proven to further elevate the level of testosterone (Carney et al., 2015) which would cause a continual

reinforcement of males' stereotypical dominance. Conversely, Carney et al. (2015) demonstrated that closed, non-expansive poses such as those undertaken by women lower the level of testosterone and raise the level of cortisol, reinforcing the submissive stereotype ascribed to women. Therefore, not only are nonverbal behaviours indicative of sex differences and gender stereotypes, but they serve to further reinforce the sex differences and stereotypes too.

One wide-scale study into the differences in nonverbal behaviour across sexes by Frances (1979) empirically investigated 54 nonverbal behaviours in videotaped interactions of 88 dyads. Frances (1979: 521 - 523) classified the variables under investigation into eight channels: turn-taking behaviours, backchannel behaviours, filled pauses, laughing and smiling, gaze, postural shifts, hand movement, and foot movement. The results showed that only the sex of the subject had a significant effect on the behavioural variables, whilst the sex of the conversational partner did not. This study showed that men and women significantly differ in their employment of certain nonverbal behaviours, and demonstrated that these behaviours correlate with the sex of the speaker and not other factors; thus, sex differences are indexed through the nonverbal channel. Furthermore, Frances (1979: 521) correlated participants' self-descriptive ratings with nonverbal measures, and found that the patterns could be linked to differences in masculinity and femininity, though no concrete conclusion was obtained.

The discussed literature demonstrates that there are observable differences in the production of nonverbal behaviour between males and females. However, this research has investigated sex differences in the production of nonverbal behaviour rather than gender differences; the participants under study were either male or female, with no consideration of differing levels of masculinity or femininity. To avoid this problem, this thesis study includes conditions in which the behaviours are either congruent or non-congruent, to truly assess

gender in the light of the new perspective. Furthermore, these studies neglect to consider how these actions are perceived by other individuals: whether they are viewed as overtly masculine or feminine, or if this is a covert feature. This will also be taken into account in the present work.

3.1.6 Perceiving gender from nonverbal communication

Apart from their importance for the creation of displays of gender, nonverbal behaviours such as position, movement, and expression are crucial for the recognition of gender (Birdwhistell, 1970: 42). This is because, as people express their own gender in interaction through various activities and behaviours, they are able to perceive interlocutor's behaviour in a similar light (West & Zimmerman, 1987: 127).

In his work in kinesics, Birdwhistell (1970: 43) found that native informants from seven different societies could distinguish between male movement and female movement, but also could identify "feminine" males and "masculine" females, albeit without specific reference to an element of nonverbal communication. However, he also deemed empirical evidence for gender differences in nonverbal communication to be insufficient, which is especially pertinent given that the distinguishing behaviours noted by the informants did not consistently coincide with scientifically abstractable gender cues (Birdwhistell, 1970: 43).

Furthermore, more specific areas of nonverbal communication have been investigated with regard to social perceptions of gender, but some studies have conflated this other types of social information, such as sexual orientation. Johnson, Gill, Reichman, and Tassinary (2007: 322) investigated how two sexually dimorphic elements - body shape and body motion - affected individuals' evaluations of a target in terms of their gender and sexual orientation. The body's shape was operationalised through the waist-to-hip ratio, as it has been found that hourglass figures with a waist-to-hip ratio (WHR) of 0.5 to 0.6 are typically perceived to be

women, whilst tubular figures with a waist-to-hip ratio of 0.8 to 0.9 are perceived to be men (Johnson & Tassinari, 2005). The body's motion was operationalised through shoulder or hip sway: walkers with swaying hips are inferred to be women, whilst those with swaying shoulders are inferred to be men (Johnson & Tassinari, 2005). Johnson et al. (2007: 323) first created 25 computer-generated animations with either gender-typical or gender-atypical body shape and motion. Then, 95 participants watched the animations and rated them in terms of their sex, sexual orientation, and gender - masculinity or femininity (Johnson et al., 2007: 323). As expected, the results for sex and gender showed that WHRs closer to 0.9 with shoulder sway were judged to be male in sex, and also to be masculine; it was found that walk motion had a greater effect than body shape on the judgements of gender (Johnson et al., 2007: 324). Therefore, it is clear that nonverbal communication in the form of body shape and body motion motivated social judgements made by participants about sex and gender. Atypical combinations of WHR and body motion motivated participants' judgements about sexual orientation: walkers with smaller WHRs and swaying shoulders, and those with larger WHRs and swaying hips were more likely to be judged as homosexual (Johnson et al., 2007: 324). However, the authors (2007: 325) note that judgements of sexual orientation were not equally motivated by the variables: evaluations for walkers perceived to be women relied on both body shape and body motion, but evaluations of sexual orientation about walkers perceived to be men only relied on body motion but not the WHR. This study clearly demonstrates how two elements of nonverbal communication can affect perceptions of sex and gender, and how atypical combinations can motivate judgements about sexual orientation.

A similar study specifically investigated participants' social judgements of a figure in terms of sex and gender when minimal information was provided (Kozlowski, Brooks, & van der Zwan, 2016: 285). A point light walker (PLW) is a visual representation of a human body, defined by a small amount of dots, which mimics human gait. These PLW displays can be

manipulated to convey sex and gender cues, using different body shapes such as broader shoulders for men, and more swaying hips for women. Kozlowski et al (2016: 288) created a continuum upon which the walker with a value of “+5” represented “male”, the walker valued “0” was equally male and female, and the walker at “-5” was “female”. They defined the points in between female and neutral, and neutral and male, as feminine and masculine respectively. Using a forced choice design, Kozlowski et al. (2016) asked 44 mixed-sex participants to observe the PLW displays and rate them as feminine, masculine, male, or female. The results showed that participants could indeed judge sex and gender from the minimal cues provided. Importantly, the study gave insight into the dissociability of sex and gender: whilst the participants responses of “female” and “feminine” did not differ significantly, the “male” and “masculine” responses did; the walkers were rated as male in many cases, and yet not as masculine (Kozlowski et al., 2016: 291).

The studies in this section investigated nonverbal communication as a whole (Birdwhistell, 1970) or conflated two aspects of the body to either masculinity or femininity respectively (Johnson et al., 2007; Kozlowski et al., 2016). Furthermore, the studies directly asked participants to rate the stimulus actors as male, female, masculine, or feminine. In this thesis study, the social judgement questionnaire was created in such a way to obscure the study’s aim, as it was thought that an overt statement of the study’s investigative target may have influenced the participants’ results.

Overall, the previously discussed literature is highly informative as it demonstrates that nonverbal behaviours appear to carry particular significations about gender, whether it is for the enactment of one’s own gender, or the perception of another’s gender.

3.1.7 Producing gender through gestures

Previous research has established the social significance of nonverbal communication, but it typically neglects to acknowledge which specific aspects of nonverbal communication contribute to gender production. For example, the observations about sex differences in Frieze and Ramsey (1976), and Henley (1997) comment on behaviours that involve the entire body, such as posture and the use of personal space when performing behaviours. Furthermore, whilst Frances (1979: 521) attempted to give a comprehensive insight into sex differences in different categories of nonverbal behaviour, over 50 nonverbal behaviours were analysed in total, and this centred around either the frequency or duration of a behaviour, rather than looking at the features of an element which may index gender identity.

Some studies which have investigated sex differences in the production of gestures in particular have also made observations about frequency. Peterson (1975: 5) investigated the use of gestures in 12 mixed-sex participants, who were observed and recorded whilst engaging in dyadic conversations. Peterson (1975: 8) found that male participants performed more gestures than females did, regardless of the conversational partner. However, the articulation of the gestures used is perhaps more salient to investigate than gestural frequency, as research has found that manipulating the form and motion of bodily movements can affect perceptions of masculinity or femininity. Therefore, it is important to look at the type of gestures that males and females use in order to establish sex differences. Peterson (1975: 9) found that certain gestures occurred more in men, for example: lifting one or both hands, sweeping gestures, and pointing; others occurred more in women, for example: fixing one's hair, rotating one hand, or tapping hands. From these observations, some gestures were found to be "strictly male": stretching hands, and pointing, whilst some were found to be "strictly female": hands in lap, or tapping hands (Peterson, 1975: 9). Peterson (1975: 13) concluded that gestures do constitute gender displays due to the differences between males' and females' gesture use.

Other studies have also empirically investigated the qualitative nature of the gestures that are employed by males and females. Rekers and Rudy (1978:840) explain that gestures can denote social status and sex role. In an experimental setting with 180 male and 180 female participants individually playing a standardised game with an experimenter, nine expressive body gestures were recorded. Based on previous literature, Rekers and Rudy (1978: 840) classified the observed gestures as theoretically feminine, due to the gestural space and the configuration of the hand-shape. It was found that the gestures were significantly different between the males and females overall. Of the nine gestures, five were significantly more frequent in females than males: limp wrist, arm flutters, flexed elbow, hand clasp, and palming. This demonstrates that even from a young age - the participants in the Rekers and Rudy (1978: 840) study ranged in age from four to eleven years old - masculinity and femininity manifest in gesture.

However, these studies provide results that are a mere observation of the occurrence of typically feminine or typically masculine gestures within the behaviour of the respective sexes; there is no information on the interpretation of the gender identity by other interlocutors. This thesis study aims to elucidate how gestures are perceived.

3.1.8 Perceiving gender from gestures

In an attempt to investigate whether gender could be detected from gestures, Won, Yu, Janssen, and Bailenson (2012) used a machine learning tool. The 24 mixed-sex participants were instructed to perform 12 different gestures for ten seconds at a time and were recorded using a Kinect camera (Won et al., 2012, section 2). There were six gestures which involved only the arm, such as pointing, or waving the arms (Won et al., 2012, section 2.3). From this data, a machine was created which aimed to automatically detect the gender of the participant (Won et al., 2012, section 2.4). The results revealed that the machine could recognise the

actor's gender at a rate significantly higher than chance from the information provided by the gestures, and also postures (Won et al., 2012, section 3). As all of the gestures were the same across participants, there must be social information conveyed by the differential articulation by men and women, which arguably, other humans should also be able to perceive.

However, these results must be closely scrutinised. The definitions of the terminology are too broad: gender is operationalised as biological sex, rather than with respect to varying levels of masculinity and femininity. Therefore, the machine operated on a binary classification of genders with masculine males and feminine females, rather than accounting for potential non-congruent gendered behaviours in either sex. Furthermore, whilst the results do suggest that gender can be perceived from nonverbal behaviours, some of which were prototypical gesture articulations, the results are obtained from a computer which was trained to detect gender using the exact stimuli it was tested with. This study at best gives us a tenuous insight into humans' ability to perceive gender, and does not inform us about how gendered gestures can motivate the social judgements that people make.

3.1.9 The current study

From this literature review, it is clear that there is a salient gap in research surrounding gender and gestures, which will now be summarised and discussed with regard to the current study. The examined literature has revealed that many studies have investigated the production of nonverbal behaviours between sexes, ranging from observational literature (Henley, 1977; Frieze & Ramsey, 1976) to empirical research (Frances, 1979). However, only a small amount of studies have focused on the production of gestures specifically in this domain (Peterson, 1975; Rekers & Rudy, 1978). Moreover, whilst there have been several papers which have investigated how social information can be perceived from specific bodily cues (Beattie &

Sale, 2012; Ambady et al., 1999; Rule & Ambady, 2008; Rule et al., 2008), none have explicitly examined gestures and gender together.

The studies which have gathered interlocutors' perceptions about gender have failed to control for other communicative phenomena such as voice, posture, and physicality. For example, in terms of perception, Birdwhistell (1970) found that the participants made their judgements about gender from nonverbal behaviour as a whole, as no specific element was identified to have been the biggest contributor. Even in studies in which the stimuli were highly choreographed and controlled, such as Johnson et al. (2007) and Kozlowski et al. (2016), the researchers conflated two elements of the nonverbal mode: body shape and body motion. Therefore, it is clear that few studies have specifically investigated which individual elements of nonverbal communication contribute to gender identity in the way that, for example, Rule and Ambady (2008) or Rule et al. (2008) investigated the influence of facial cues alone on sexual orientation judgements. The one study which aims to investigate gesture as a means of perceiving gender (Won et al., 2012) is problematic, and the results may not be generalisable to human perception and cognition. Therefore, this thesis study manipulates only the gestural mode whilst controlling for other nonverbal behaviours, and a social judgement task is used to gather insight into how individuals perceive gender from gestures, and how this affects their evaluation of an individual.

Furthermore, the discussed studies have tended to use a one-to-one mapping of sex and gender, which restricts masculinity to males and femininity to females. For example, Won et al. (2012) defined gender as biological sex, with no consideration for the participants' different levels of masculinity or femininity. Later perspectives on gender postulate that the sex term "male" is semantically dissociable from the gender term "masculine", and similarly, the sex term "female" is semantically dissociable from the gender term "feminine" (Kozlowski et al., 2016: 285). This ideological distinction between terms has been reflected in

behaviour, as with the increased knowledge of sex roles, feminists are actively distancing themselves from typically feminine and submissive postures, giving preference to stereotypically masculine features instead (Brown, 1974, in Henley 1977: 139). Furthermore, it has been demonstrated that individuals can perceive such sex-gender deviance from others' nonverbal behaviours as a whole, as Birdwhistell (1970) found that participants could identify feminine males and masculine females, but without pinpointing specific characteristics which influenced their evaluation. More specific empirical research needs to be conducted about nonverbal communication in the case of gender identity deviating from biological sex, as this has been observed in production but has not been investigated in terms of perception. Furthermore, there needs to be more specificity regarding the type of nonverbal communication leading to such constructions and subsequent interpretations. This study aims to achieve this by empirically investigating how social judgements differ when there is congruence or incongruence between sex and gender, by manipulating hand-shape and gestural space to imitate typically masculine and feminine behaviours. Congruence will be demonstrated through males using masculine gestures, and females using feminine gestures, whilst incongruence will be shown through males using feminine gestures and females using masculine gestures. By investigating social judgements using conditions in which actors use non-typical gestures for their biological sex, this study fits in with the later perspectives of gender, rather than utilising a one-to-one sex-gender mapping.

This thesis study aims to further previous research by specifically investigating one element of bodily behaviour - gesture - and its influence on participants' evaluations of an individual's gender. In order to fill the gap left by previous literature, the research question for this thesis asks: *how do differences in hand-shape and gestural space configurations affect social judgements about gender identity made by individuals?* The hypothesis is: hand-shape

and gestural space will motivate the judgement of gender identity in participants' social judgement ratings.

It is expected that there will be differences in the social judgement responses of the participants across conditions, which will demonstrate that participants can perceive, integrate, and interpret gender identity from the gestural mode. Due to the combination of sex norms and the gender information conveyed by the gestures, it is expected that the male-masculine condition will be rated as the most masculine condition, and the female-feminine condition will be rated as the most feminine condition. As there is little research into the social judgements based on incongruent sex-gender gesture usage, it is unreasonable to draw specific predictions about the results for the mismatch conditions. However, it can be said that the results for the male-feminine and female-masculine conditions will differ from the male-masculine and female-feminine results, as it is expected that the mismatch conditions will provoke less stereotypical evaluations of the actors, due to the conflicting sex and gender information. For example, for the female actor using masculine gestures, it is expected that participants will give her higher scores for the more masculine traits, such as "strength" or "dominance".

This study will further contribute to the field by investigating the potential for hand-shape and location in gesture space to influence the perception of masculinity and femininity. If this study provides significant results, it will contribute to the field of research into gender identity by helping to specify how both stereotypical and non-typed gender identities are constructed and perceived. This will be achieved by specifying that gestures are informative about masculinity and femininity. Spence and Helmreich (1978: 11) note that cross-sex behaviours can have negative implications for the individual; this could be due to the lack of understanding about gender identity construction and behaviours. In the words of West and Zimmerman (1987: 147), social change must occur at the "institutional and cultural level of

sex and at the interactional level of gender”. Even if the study did not provide significant results, it would contribute to the same field by demonstrating that it is potentially other nonverbal behaviours that construct gender identity and not gestures; further research could focus on posture or gaze instead, for example.

4. Methodology

4.1 Design

The experimentation involved a social judgement task regarding evaluations of an individual’s masculinity and femininity. A stimulus video involving a trained actor was the source of judgement, and the participants’ perceptions were obtained through their ratings of selected characteristics from the Bem Sex Role Inventory (BSRI) (Bem, 1974). The items from the BSRI were personality traits, so they were oriented toward the actor as an individual without reference to specific components of their body or behaviour. Between the conditions, the independent variable, gestures, was manipulated to mimic typically masculine and feminine gestural configurations in order to investigate the influence on the dependent variable: the perception of gender identity. The gestures were either masculine or feminine, and congruent or incongruent with the actor’s biological sex (see Section 4.2.1).

Hammond, Stewart, Berndt, and Steinmann (1975: 276) describe social judgement theory as one which is intended to be descriptive and relevant to life, used to understand human judgement. This method was highly appropriate for the research question regarding individuals’ perception, for multiple reasons. One salient benefit of the social judgement task is that it allows variables to be controlled, as the stimulus videos were each highly scripted and choreographed in terms of the actor, the speech, and the gestures which operationalised masculinity and femininity. This meant that the 30 participants within a condition were seeing exactly the same video and made their judgements about the same phenomena in the stimulus:

therefore, only individual variation in perception contributed to any variation in the results per condition. Furthermore, variables could be controlled across conditions so that only the independent variable - gestures - was different, whilst all other elements were maintained to be the same as the other conditions. Therefore, it can be concluded that differences in the participants' perceptions across conditions were directly caused by differences in the gestures in the stimulus videos.

As participants were asked to respond to statements about personality traits which are covertly linked to the variable of gender identity, the social judgement task allowed for insight into participants' intuitions about masculinity and femininity in a manner that did not bias the results by asking direct questions. Furthermore, it can be ensured that the results reflect the overall social impression attained by the interlocutors, rather than the interpretation of the three individual gestures, as participants were exposed to the entirety of the stimulus video before responding to the statements about the actor. This reflects the same process of making judgements about a person that occurs in real life situations, as whole interactions influence perceptions, and therefore increase the study's ecological validity. This notion was raised by Holler, Shovelton, and Beattie (2009: 76) who critiqued for example Beattie and Shovelton (1999, 2001, 2002) for the use of clause-length segments as stimuli, as in natural speech, these segments would be nested within a wider, more complex narrative. Furthermore, some studies, such as Beattie & Shovelton's (1999, 2001, 2002, in Holler et al., 2009: 76), allowed participants to replay the stimulus videos despite this violating the qualities of natural speech, as interlocutors typically do not get repeated chances to see a gesture. The social judgement task used in this study constitutes a format close to natural conversation settings, as participants can only see and hear the utterances once, and the utterances are embedded in a full narrative.

The social judgement task facilitates statistical analyses, as it allows participants' qualitative judgements to be gathered as quantitative data as Likert-scale ratings. Therefore, the resulting numeric data can be easily analysed in terms of significance.

Another benefit of the social judgement task is that it can be distributed to a large participant sample: participants can complete the survey individually, and as the study only requires that the subjects are able to see, hear, and understand the stimulus video and the following questions, the study can be completed by a wide demographic.

Beattie and Sale (2012: 96) demonstrated that semantic information articulated in metaphoric gestures can influence the social judgements participants make, as speech-gesture mismatches were shown to cause participants to judge the speaker as less trustworthy and less likeable. The current study used a similar methodology to see if the same effects held for the social information conveyed by gestures. However, the methodology used in this thesis study differed from Beattie and Sale (2012). In the current study, the semantic information conveyed in each of the four conditions was identical: the verbal script was maintained so that the semantics of the lexicon were the same, and also the semantic information conveyed by the gestures was equivalent across conditions. It was the realisation of the social content which differed, as the structural components of hand-shape and space in the gestural mode were altered to reflect masculinity and femininity. So, whilst in Beattie and Sale's (2012) study, the propositional content conveyed by the verbal and gestural modes conflicted through the use of semantically mismatching gestures, in this study, only the social content differed.

As this study involved a social judgement task, it used a between subjects design. As stated by Beattie and Sale (2012: 94), it is impossible to watch the same person perform the same script but with different gesture articulations and to make a completely new social judgement about this person. Therefore, it was important that participants were only exposed to one condition and only saw one stimulus video.

4.2 Materials

4.2.1 Videos

The materials used in this study consisted of multimedia stimuli in the form of video recordings of a mock advertisement created by the researcher. Videos were deemed to be an appropriate form of stimulus material, as Gullberg and Holmqvist (2006: 17) found that gestures in video conditions received similar amounts of fixations to real-life interactions, as the difference was not statistically significant.

The verbal script remained constant for each condition, but the gestures and sex of the speaker differed. There were four videos in total, meaning that there was a different stimulus video for each condition. The video for Condition 1 was 32 seconds long, and featured a male actor performing masculine gestures. The video for Condition 2 was 33 seconds long, and involved a female actor performing feminine gestures. The video for Condition 3 was 32 seconds long, and involved a male actor performing feminine gestures. The video for Condition 4 was 30 seconds long, and featured a female actor performing masculine gestures. Although the videos are not identical in length, the differences are considered to be minor and irrelevant, as they were due to small variations in the speech rate of the actors. The video length of approximately 30 seconds was deemed to be ample time for participants to make judgements about the actor's gender identity, as Willis and Todorov (2006, in Rule & Ambady, 2008: 1) found that participants could judge personality traits consistently between 100ms and 1000ms. As the participants in the current study are also evaluating personality characteristics - although instead, the traits relate to gender identity - it was expected that similar accuracy in judgement would be gained from a video which is longer than that in Willis and Todorov's (2006, in Rule & Ambady, 2008: 1) study. Research into the perception of other social information such as sexual orientation has found that participants can make accurate judgements from videos of as little as 50ms (Rule & Ambady, 2008: 2) up to one

second and ten seconds (Ambady et al., 1999). However, as Ambady et al. (1999: 541) found that participants were significantly more accurate at judging sexuality in the ten second clip compared to the one second clip, it was thought that a longer stimulus video would allow the same or greater accuracy.

In order to create these stimulus videos, first the verbal script for an advertisement was created. The genre of an advertisement was chosen because many studies investigating gender and gestures have looked at the medium of print advertising, such as Bell and Millic (2002), Goffman (1976), and Timke and O'Barr (2017). A video advertisement was chosen in order to include the stroke phase of the gesture as opposed to only the stroke hold. Additionally, Beattie and Shovelton (2005: 24) found that television advertising was significantly more effective than radio advertising ($p < 0.002$) and textual advertising ($p < 0.005$) when iconic gestures were used, so it is clear that gesture is salient and appropriate in this field.

It was important to choose a gender-neutral product as the subject of the advertisement so that if there were effects of gender in the results, then these would be caused by the gestures alone as opposed to pre-existing judgements about the appropriateness of a product for either sex. Influenced by one of Beattie and Shovelton's (2005: 29) stimulus videos, it was decided that the topic of the advertisement would be a fruit-based fizzy drink as it was thought that this would appeal equally to both sexes. The stimulus video for the current study is similar to Beattie and Shovelton's (2005: 37) in terms of the product, the intended medium of television advertising, and some phrasing such as "fresh" and "everyone will be [verb]-ing it" in the script. However, in the current study, only one actor featured per video. A gender-neutral lexicon was used: previous to the creation of the video stimuli, four native English speakers - two males and two females - scrutinised the script, in order to check for gender biases. The judges stated whether they instinctively thought the script appealed more to men or women, and pointed out any lexical items which influenced their choice. The judges

identified four lexical items: “delicious”, “natural”, “antioxidants”, and “sensation” which were deemed to be more feminine, so these were altered. One idiomatic phrase “pick-me-up” was deemed inappropriate considering that there would be second language speakers of English in the participant sample, and so was replaced. The final script was checked by the same judges, who confirmed that it was suitably gender neutral. This pre-testing of the script was influenced by Beattie and Sale (2012: 96) who highlight the importance the creation of suitable stimuli: one of their conditions provided results that were surprisingly non-significant or contrary to their expectations, due to the inappropriateness of the spoken message and gestures. It is for this reason that a gender-neutral product was chosen, and furthermore, the verbal stimuli were verified.

4.2.2 Gestures

The selection of the stimulus gestures were influenced by previous literature and a descriptive analysis of gestures in advertisements. Goffman (1979) gave descriptions of the stereotypical presentation of men and women in print advertisements, analysing bodily behaviours such as posture, position in relation to other beings, facial expressions, and touching. Goffman (1979: 29) stated that, in terms of bodily behaviour using the hands, women tended to be portrayed as barely touching something or gently cradling it, which he deemed “the feminine touch”; alternatively, men were seen to grasp or hold an object with more strength or purpose. Henley (1977:136) looked at arm position, describing how women tend to hold the upper arms near the body, whilst men keep the arms up to 20 degrees away from the trunk, which was interpreted as displays of femininity and masculinity respectively. Rekers and Rudy (1978: 840) empirically investigated gestural use in male and female children through the use of a standardised play task. They found that five of the nine theoretically feminine gestures occurred more frequently in girls’ behaviour than in that of boys; specifically related to hand-

shape and gestural space, they found that females had a significantly higher usage of limp wrist and flexed elbow when gesturing, giving empirical evidence for the aforementioned descriptive research (Rekers and Rudy: 1978: 840).

These phenomena were also found in a descriptive analysis of male- and female-oriented advertisements performed by the researcher. Two 30-second shampoo adverts from the brand Head & Shoulders were chosen in order to ensure comparability between the two analyses, so that differences in gestures were attributable only to the sex of the actor and not to different brand ideologies. In the female-oriented advert (Head & Shoulders ANZ, 2016), only female actors were featured, and only one appeared on screen at a time. In the male-oriented advert (ABTP Artists, 2013), there were a mixed group of actors but the main characters were male: these two protagonists interacted with each other during the advert. To analyse these adverts, the individual gestures were analysed in terms of hand-shape, orientation, movement and location. It was found that women tended to have softer hand-shapes with relaxed or bent fingers, whilst men had straighter fingers and held objects with more strength. The female usage of limp wrist was identified, whilst men tended to have rigid wrists with their hand straight from the arm. Men were found to utilise a wider gestural space, extending their arms straight upwards or at a 90 degree angle sideways from the body, whereas women always kept their elbows close to their body, even when their hands reached above shoulder height.

From these analyses, gestures involving such characteristics were chosen and scripted into the stimuli, operationalising the notions of “masculinity” and “femininity” in this study. The first gesture used in the script is an iconic gesture corresponding to the noun “boost” where the actor’s arms began at their sides, then rose to bring the hands close together and then the hands moved further apart at the end of the gesture. In the masculine version (see Appendix 1), the fingers were kept straighter, and the elbows were further from the body,

with the hands further apart at the end of the gesture; in the feminine version (see Appendix 2), the actor's fingers were more bent and the elbows were kept close to or touching the body, meaning that the hands extended less far. The second gesture corresponded with the phrase "the choice is yours" and functioned as a deictic, with the actor extending their arm towards the audience. In the masculine version, the elbow was flexed and extended further from the body, with the palm flat and fingers straight; in the feminine version, the palm was more closed, with the fingers bent. The final gesture of the script was a shrug gesture corresponding to the phrase "so why miss out?". In the masculine version, the elbows were raised far from the sides, and the palms were open and the fingers were straight; in the feminine version, the elbows stayed held against the trunk of the actor's body, whilst the fingers were slightly bent.

Another bodily movement was added to the advertisement in order to act as a filler or distractor, in case the high frequency of gestures became obvious to the participants and they overtly focused on this feature. This involved an interaction with the product: the actor held the bottle of fizzy drink up in front of their torso whilst introducing the brand, then put the bottle down out of shot. This action featured at the start of the video as it seemed most appropriate for contextualisation of the advert, and it was thought that if the advert began with a gesture, this may have drawn attention to the aim. Furthermore, a counting action was involved when the actors listed off the flavours of the drink: "tropical, cranberry, and apple & blackberry". This was included as it made the actors' gestures appear more natural in the context of the advert; otherwise, all arm and hand movements occurred at the end of an utterance, so participants may have detected a pattern as to when the gestures would occur. However, this counting action was adapted to fit the desired gender identity of the actor in each condition: in the masculine conditions, the actors' fingers were straighter and the wrist was strong; in the feminine conditions, the actors' fingers were more bent and relaxed, with a limper wrist.

4.2.3 Online study

The subsequent material for conducting the study took the form of an online survey through the Qualtrics platform. The use of an online medium was appropriate for this study as it meant that the questionnaire could be advertised and shared on various social media platforms, such as Facebook, Twitter, and Reddit, meaning that a larger participant base could be reached. It also appealed to participants that they were able to complete it in their own time and environment, by simply clicking the link that was advertised to them.

The questions provided in the online survey were identical across all conditions; the only part of the survey which differed was the presentation of the four stimulus videos. Only one of the four videos was displayed per questionnaire, which Qualtrics randomly but evenly distributed, to ensure that an equal number of participants were exposed to each of the four conditions overall. The majority of the online study consisted of five-point Likert-scale questions, asking participants to rate the actor in the advert for different characteristics (see Appendix 3 and 4). The characteristics in the prompts were a mixture of ten typically masculine traits and ten typically feminine traits. These characteristics were selected from the BSRI (Bem, 1974) which includes a list of traits which are characteristically associated with women, for example “sympathetic” and “gullible”, and those that are typically associated with men, for example “self-reliant” and “competitive” (see Appendix). It was decided that it would be better not to use the entirety of the BSRI for this study. Some characteristics were inappropriate for the aim of this study: whilst being “softly spoken” is associated with femininity in the Bem Sex Inventory, this feature could not be used for the current study as it is related to the verbal mode instead of the gestural mode. Similarly, whilst being “athletic” is associated with masculinity in the Bem Sex Inventory, participants may base this on the actor’s body type instead of the gestures that they employ, so it was excluded. Further characteristics were excluded on the grounds that they were overly transparent to the aims of

this study such as “masculine” and “feminine”, or they were repetitive and synonymous of other adjectives. For example, “self-sufficient” was deemed to be too similar to the other masculine characteristic “self-reliant”. The selected adjectives and verb phrases were inserted into prompt sentences. These sentences were randomly ordered so that, mostly, a feminine feature followed a masculine feature; however, so that participants could not notice a pattern, occasionally two feminine features or two masculine features would be placed together. The prompts began with the phrase “this person”: a gender-neutral referent was used so that the gendered pronouns “he” or “she” did not influence the participants’ judgements of the actor. For example, the participants read the prompt “this person is submissive” and were asked if they: strongly disagreed, disagreed, neither agreed nor disagreed, agreed, or strongly agreed, by clicking on the corresponding button. In terms of numerical values, “strongly disagree” was rated 1, “disagree” was rated 2, “neither agree nor disagree” was rated 3 as it was the neutral point, “agree” was rated 4, and “strongly agree” was rated 5. The final social judgement ratings that the participants made about the speakers were the dependent variable for this study.

The other questions asked for the participants’ background: their age, their gender, their nationality, the languages that they speak, and their study programme. Unlike the social judgement questions where participants were only able to respond by clicking a button, the participants could answer the background information questions by entering text, as the questions were more open-ended. These questions were included in order to inform the researcher of the demographic from which the results came. Finally, participants were asked if they knew or could guess what the purpose of the study was. It was decided that if the participant wrote something relevant to both gesture and gender that their responses would be excluded as it would appear that the aims of the study were too transparent for this participant.

4.3 Participants

Altogether, 120 subjects participated in this study: 60 males and 60 females, who were recruited through online media. The minimum age was 18 years old and the maximum age was 83, so the range for the participants was 65 years. All participants stated that they spoke English, but many knew additional languages as well. Over half of the participants (65 out of 120) were of British nationality, and the remaining participants varied in nationality, including: Turkish, Greek, Dutch, Indonesian, American, Belgian, German, Italian, Lithuanian, Mexican, Nigerian, Serbian, Slovenian, Spanish, and Russian.

To create four mixed groups of 30 participants each, 15 participants of each sex were assigned to four conditions, shown in Table 1.

Condition	Average Age (years)	Minimum Age (years)	Maximum Age (years)	Age Range
1	31.6	19	83	64
2	30.3	20	59	39
3	29.4	18	66	48
4	29.9	20	71	51

Table 1: data for the participants' ages per condition.

4.4 Procedure

After accessing the survey through the URL link, participants were directed to an introductory information page, which explained the process of the survey. The participants were told that they would watch a video, then answer 20 questions about what was in the video, and then answer 5 questions about themselves. On this page, participants were also informed that the data would be kept anonymous but that they could withdraw at any point, and were provided with the researcher's email address in order to direct any questions to or to withdraw their

response. Finally, to proceed with the study, participants had to confirm that they had read the information provided and that they were above 18 years of age by clicking the “I consent” option; if they clicked the “I do not consent” button, an error message appeared telling them that they could not participate in this study.

After clicking the “Next” button, participants were redirected to a page with the randomly selected video. There was a textual instruction telling participants to watch the video and advised them to make the video full-screen to do so, and then to click the “Next” button when the video was finished. Once this step was complete, the participants moved onto another instruction page where they were asked to respond to statements about the person in the video; they were told to do this instinctively and not to alter any previous answers, in order to ensure that participants were answering honestly and without attention to a pattern. Subsequently, the social judgement prompts were presented, with five on each page, to make the study feel more digestible to participants, and also to further reduce the possibility that they would change previous answers. Once these answers were complete, the participants were directed to the background questionnaire, and then to a final page where they were thanked and provided once more with an email address to contact if they had any questions.

This order was chosen for the display of questions as it was thought that if the participant background questionnaire was provided before the video, the participants may have been primed to look for age or gender cues as they had to state this information about themselves. The social judgement questionnaire was presented on different pages to the stimulus video, in order to prevent the content of the questionnaire from influencing the attention they dedicated to certain elements of the advertisement.

4.5 Analysis

Once the data was collected, the responses were converted numerically in order to allow for quantitative analysis. For each participant, the ratings were grouped according to masculine features and feminine features, and separate average scores were calculated for the masculinity ratings and femininity ratings.

As this study was based on a between-subjects design, independent t-tests were performed (Field, 2009: 334) using SPSS version 22, in order to find out the differences between the means. These tests calculated the differences between the two male conditions (Condition 1 and Condition 3), and the differences between the two female conditions (Condition 2 and Condition 4). The condition was the grouping variable and the perception of gender was the independent variable. These comparisons showed whether the type of gestures that the speaker used affected the participants' perception of their gender identity.

Independent t-tests were not run to directly compare the two masculine gesture conditions (Condition 1 and Condition 4) or the two feminine gesture conditions (Condition 2 and 3), as they are not comparable. The reason that a male speaker and a female speaker were involved in the stimulus videos was to rule out the confound of speaker sex.

Whilst parametric tests have previously been criticised when using Likert-scale data, there is a large body of literature which suggests that these tests can be appropriate (Norman, 2010: 626). Carifio and Perla (2008, in Norman, 2010: 628) argue that as Likert scales consist of "sums across many items", the data can be treated as interval instead of ordinal. Therefore, in this case, independent t-tests were deemed to be an appropriate statistical analysis as the data could be treated as interval, and the tests could allow inferences to be made about the averages and differences across conditions.

5. Results

For each t-test, the Levene's test was not significant, and so the homogeneity of variances was met (Field, 2009: 340). First, the masculinity ratings were compared through an independent t-test between the male-masculine and male-feminine conditions. The mean masculinity rating for the male-masculine condition was within the neutral point. The mean masculinity rating for the male-feminine condition was below the neutral point, which suggests that participants disagreed that the actor was masculine in this condition. On average, participants rated the male-masculine condition as more masculine ($M = 3.05$, $SE = 0.14$) than the male-feminine condition ($M = 2.75$, $SE = 0.12$). This difference was not significant $t(58) = 0.12$, $p > .05$; it represented a less than small-sized effect $r = 0.20$.

Then, the femininity ratings were compared through an independent t-test between the male-masculine and male-feminine conditions. The mean femininity rating for the male-feminine condition was within the neutral point. The mean femininity rating for the male-masculine condition was below the neutral point, suggesting that participants disagreed that the actor was feminine in this condition. On average, participants rated the male-feminine condition as more feminine ($M = 3.04$, $SE = 0.10$) than the male-masculine condition ($M = 2.91$, $SE = 0.11$). This difference was not significant $t(58) = 0.4$, $p > .05$; however, it did represent a small-sized effect $r = 0.11$.

The masculinity ratings were compared through an independent t-test between the female-feminine and female-masculine conditions. The mean masculinity ratings for the female-masculine and the female-feminine condition were both within the neutral point, but the female-masculine condition was deemed more masculine. On average, participants rated the female-masculine condition ($M = 3.49$, $SE = 0.12$) as more masculine than the female-feminine condition ($M = 3.29$, $SE = 0.13$). This difference was not significant $t(58) = 0.26$, $p > .05$; however, it did represent a small-sized effect $r = 0.14$.

The femininity ratings were compared through an independent t-test between the female-feminine and female-masculine conditions. The mean femininity ratings for both female conditions were both below the neutral point, which suggests that the participants disagreed that the actor was feminine, but the female-masculine condition was deemed least feminine of the two conditions. On average, participants rated the female-feminine condition as more feminine ($M = 2.79$, $SE = 0.11$) than the female-masculine condition ($M = 2.41$, $SE = 0.09$). This difference was significant $t(58) = 0.01$, $p > .05$; it represented a medium-sized effect $r = 0.32$.

Due to the fact that the results of the first analysis were not significant, it was decided that the items should be collapsed in a secondary analysis. Once more, a masculine score and a feminine score were calculated for each condition, however, this time, all 20 items were included in each score. This was achieved for the masculine scores by calculating the inverse of the femininity score for each item. This meant that if participants had, on average, answered “strongly disagree” to feminine items, this would be transformed to mean that participants “strongly agreed” that the actor was masculine. To exemplify this further, a score of 2.6 (disagree) was found for the feminine item “eager to soothe feelings” in Condition 1; this was inversed to create a masculinity score of 3.4 (agree). A similar process was conducted for the femininity scores, by inverting the masculinity scores so that “strongly disagree” for a masculine feature became a “strongly agree” feminine score. This created a more robust overall score for both masculinity and femininity in each condition, as twice the amount of items contributed to the overall score in comparison to the first analysis.

Once more, independent t-tests were calculated to compare the masculinity scores and the femininity scores between the two male conditions (Condition 1 and Condition 3), and the female conditions respectively (Condition 2 and Condition 4).

First, the masculinity ratings were compared through an independent t-test between the male-masculine and male-feminine conditions. The mean masculinity rating for the male-masculine condition was within the neutral point. The mean masculinity rating for the male-feminine condition was below the neutral point, suggesting that the participants disagreed that the actor was masculine in this condition. On average, participants rated the male-masculine condition as more masculine ($M = 3.07$, $SE = 0.07$) than the male-feminine condition ($M = 2.86$, $SE = 0.06$). This difference was significant $t(38) = 0.02$, $p > .05$; it represented a medium-sized effect $r = 0.37$.

Then, the femininity ratings were compared through an independent t-test between the male-masculine and male-feminine conditions. The mean femininity rating for the male-feminine condition was close to the neutral point. The mean femininity rating for the male-masculine condition was slightly below the neutral point, suggesting that the participants disagreed that the actor was feminine in this condition. On average, participants rated the male-feminine condition as more feminine ($M = 3.15$, $SE = 0.06$) than the male-masculine condition ($M = 2.93$, $SE = 0.07$). This difference was significant $t(38) = 0.02$, $p > .05$; it represented a medium-sized effect $r = 0.37$.

The masculinity ratings were compared through an independent t-test between the female-feminine and female-masculine conditions. Both the female conditions had average masculinity ratings within the neutral point, but the female-masculine condition had a higher score. On average, participants rated the female-masculine condition as more masculine ($M = 3.54$, $SE = 0.07$) than the female-feminine condition ($M = 3.25$, $SE = 0.05$). This difference was significant $t(38) = 0.001$, $p > .05$; it represented a medium-sized effect $r = 0.49$.

The femininity ratings were compared through an independent t-test between the female-feminine and female-masculine conditions. Both the female conditions were scored below the neutral point, but the female-feminine condition received a higher score. On

average, participants rated the female-feminine condition as more feminine ($M = 2.93$, $SE = 0.07$) than the female-masculine condition ($M = 2.46$, $SE = 0.07$). This difference was significant $t(38) = 0.00$, $p > .05$; it represented a large-sized effect $r = 0.62$.

6. Discussion

6.1. Preliminary analysis

The results from the preliminary analysis showed that, whilst there were differences between scores for each condition, the only significant difference was that the femininity scores for the female-feminine condition were significantly higher than the scores for the female-masculine condition. This suggests that the different gestural configurations only contributed significantly to the femininity ratings of women. The hypothesis that different gestural configurations would influence participants' social judgements of an individual's gender identity did not hold for three out of the four conditions, and therefore has not been concretely confirmed.

6.1.1 Theoretical explanations

These results may be explained by previous research. Bailey and Kelly (2015) found that females could be associated with low-V words, and this was facilitated by congruent, low-V posing; there were fewer error rates and faster reaction times. This demonstrates that participants perceived and integrated the power information encoded by the poses, and judged the female targets as submissive (low V). However, when the female target performed a high V pose, there were more errors and slower reaction times when classifying low-V words, suggesting that women were more associated with high V (Bailey and Kelly, 2015: 229). This demonstrates that the poses were informative to the participants, as they could perceive the high or low power enacted by the participants, and could flexibly associate the female with

both power levels. In terms of this study, it could explain why there was a significant difference between the femininity ratings for the female-masculine and female-feminine condition. The participants perceived and integrated the femininity encoded on the gestures in the female-feminine condition, and therefore judged the target actor as more feminine. Alternatively, the participants in the female-masculine condition perceived the masculinity in the gestures, and therefore rated the actor as less feminine.

Despite the female congruent condition being rated as significantly more feminine than its incongruent counterpart as expected, the masculinity ratings in the male conditions were not significantly different. This may be explained by considering previous research into a similar theme of sexuality, which has found that female targets are, in general, judged to be heterosexual or homosexual with a greater accuracy than male targets when the stimuli regards nonverbal behaviour (Ambady, Hallahan, & Conner, 1999: 542). Therefore, it could be that females' gender identity is also perceived more accurately than that of males. Furthermore, Johnson et al. (2007:322) found that different nonverbal cues informed participants' judgements of men's and women's sexuality respectively. Perhaps a similar influence was found in this experiment, as the female actor's gestures influenced the participants to make different judgements about her femininity, but gesture was less informative when making judgements about men. It could be that gesture is not as "sexually dimorphic" as other nonverbal cues such as body shape or body motion (Johnson et al., 2007: 322) and therefore only provides significant information about gender for women.

However, this theory does not necessarily hold when comparing the results from previous literature. Johnson et al. (2007: 331) argue that gender atypical motion could more extremely impact the judgements of males' sexuality; therefore, the incongruent gestural information should have provoked more extreme judgements. Research into sexual orientation has demonstrated that whilst static information is sufficient for participants to judge females'

sexuality, motion is necessary in order to make accurate evaluations of males' sexuality (Ambady et al., 1999; Johnson et al., 2007: 331). Evidence from studies such as Pleck (1995, in Bailey & Kelly, 2015: 332) suggest that males' gender construction and performance is more strictly regulated than women's, so violations are perceived as more extreme. Violations of male sex-roles include the enactment of low-status, submissive behaviour (Remland, Jacobson, & Jones, 1983: 26). It is argued that femininity is perceived as a "deviation" from the norm (Bem, 1993, in Johnson et al., 2007: 331), so when men enact femininity, there may be harsher judgements. Therefore, based on this, it would have been expected that there were significant differences in the femininity ratings between the male conditions due to the divergence from sex stereotypes in the male-feminine condition. However, Bailey and Kelly (2015: 330) found that regardless of whether the pose was high V or low V, participants did not readily associate men with low-V words, as demonstrated by the lack of statistically significant difference in error rates and reaction times. Bailey and Kelly's (2015) low-V poses are similar to the feminine gestures in the current study, as they involve smaller zones of space. This could explain the lack of a significant result for both the masculinity and femininity ratings between the male conditions, as despite the gestures conveying femininity in the male-feminine condition, participants may have found it less easy to dissociate males from masculinity, and rated the two conditions similarly. As such, sex norms for men appear to have outweighed the gestural information in this case. Furthermore, the idea of femininity being disparaged could explain the significance of the difference in femininity scores for the female-masculine and female-feminine conditions. If it is the case that femininity is indeed perceived as not ideal, or inferior (Bem, 1993:42, in Johnson et al., 2007: 331), then perhaps participants were regarding the overt feminine behaviour with contempt and was therefore judged more strongly, even when it was enacted by a female.

This theory about the acceptability of sex-gender deviations may also explain the lack of a significant result for the masculinity score in the two female conditions. Bem (1993: 42, in Johnson et al., 2007: 331) argues that females enacting masculinity are perceived as striving for the societal ideal, so it may be the case that displays of masculine behaviour are viewed more leniently in females - despite being deviant from sex stereotypes. Further evidence for this was demonstrated by Levant and Pollack (1995, in Bailey & Kelly, 2015: 333), who argue that masculinity displays are rewarded for both men and women, whilst femininity is disparaged. Therefore, a female enacting masculine gestures, whilst deviating from gender-typing, is seen as conforming to society's prescriptions, so the behaviour is not actually seen as inappropriate. It may be that the gestures had less influence on the masculinity scores in the female conditions, because this behaviour is more acceptable. In terms of previous research, Bailey and Kelly (2015) found that females enacting high V (typically masculine) poses, lead participants to make significantly fewer errors when classifying high V words. This means that the pose was highly informative, as participants perceived and integrated the high-power information encoded by the nonverbal cues. Bailey and Kelly's (2015) high-V poses were similar to the masculine gestures in this study in that they were more expansive and open. Therefore, in this study it could have been expected that females performing masculine gestures would be rated as more masculine than the female-feminine condition, as participants could perceive and integrate the masculinity of the gestures. However, Bailey and Kelly (2015: 331) interpret their results to mean that participants more flexibly associated females with both high and low-V words. Participants associated the high-V words with women, even though their gender is typically associated with low V. Therefore, in this study, the non-significant difference in the masculinity ratings for the female-masculine and female-feminine conditions may be due to the fact that females are able to be associated with power and masculine traits, so the behaviour is not seen as

deviant from femininity. It could even be argued that such behaviours are no longer seen as masculine, but are also a feature of femininity.

6.1.2 Potential stimulus issues

Whilst the results from the previous analysis have been evaluated and explained in terms of previous research, it is worth considering that there were issues with the present study which contributed to the results.

For example, it could be that there was an issue with the stimuli used in the experimentation process. For example, social constructivists propose that it is the individual's interaction with their immediate context which is reflected by masculinity and femininity (Deaux & Major 1987; Leaper 2000, in Mehta & Dementieva, 2017: 605). The mock advertisement was considered to be an interaction within a context, as the actors were speaking, gesticulating, and interacting with the product and the audience who were watching. However, it could be argued that this may not represent a prototypical interaction, where two interlocutors are conversing with and responding to each other, and that masculinity and femininity are more noticeably enacted in a dialogic interaction. However, for the social judgement task, it would have most likely been more difficult for participants to provide representative ratings for one person based on a conversation between two people, and it may have been even more distracting to attempt to provide responses for two people simultaneously.

The use of a video recording of an advertisement allowed for many other variables to be controlled when creating the stimuli, and ensured that the stimuli was consistent within conditions, which could not be achieved in real-life interactions. Despite these benefits, it could be argued that the use of a video was not naturalistic enough to constitute a real interaction. However, Gullberg and Holmqvist (2006) used an eye-tracking study to

investigate whether attention to gestures was modulated by the presence or absence of a real interlocutor. Sixty participants were assigned to one of three conditions: a live interaction, a life-size video of the target actor, and a computer-screen version of the video (Gullberg & Holmqvist, 2006: 12). The results demonstrated that whilst there was a low amount of fixations (< 0.5%) to the target in all three conditions, the difference between the video conditions and the real-life condition was not statistically significant (Gullberg & Holmqvist, 2006: 17) suggesting that participants still fixated on gestures as much in the video conditions as they did in a real life interaction. Whilst the small-screen video condition did result in fewer fixations than the life-sized video condition, the authors conclude that direct fixations on gestures may not be necessary to acquire gesture meanings, as peripheral vision appeared to be sufficient (Gullberg & Holmqvist, 2006: 25). The authors dissociate the terms visual fixation and visual attention, arguing that covert attention can be paid to a gesture without directly fixating on it. Therefore, it appears that using a video stimulus interaction is sufficient to gain information about how participants perceive gestures.

Another potential issue with the stimuli which may have contributed to the non-significance of some of the results is the prosody that the actors used. Whilst the lexicon of the script was controlled for in terms of gender, it is a possibility that the actors' manner of speaking influenced the participants scores. There were differences in the lengths of the videos; the shortest (Condition 4) was 30 seconds long, whilst the longest (Condition 2) was 33 seconds long. This suggests that there were differences in the rate at which the script was spoken, whether this was in terms of the speed at which the individual utterances were spoken, or the length of the pauses which separated them. The rate, and perhaps volume, of the actor's speech could have confounded the scores for masculine features such as "assertive", "dominance", and "defends own beliefs", as these could easily be interpreted to be about the actor's conversational style as opposed to nonverbal behaviour.

There were also detectable differences in intonation which may have influenced the participants' ratings. For example, the feminine characteristics like "gentle" or "tender" could be seen to describe the way someone speaks as opposed to their personality. It might be argued that this influence is reflected in the results, with evidence from participants' responses when asked what they thought the purpose of the study was. One participant in Condition 1 answered "...how we perceived this guy off his tone of voice", and there were five comments which could be categorised under the "use of language". In Condition 2, there were similar comments about speech. One participant even believed that the study was specifically about the "effects of intonation and inflections on...effectiveness of speech", whilst another said "if you can judge a person's character by the way they talk". Two participants suggested that the behaviour under examination was a combination of vocal and nonverbal behaviours. This was reiterated by three comments in Condition 3, who believed that the study investigated language and body language. One participant believed it to specifically be about how the actors talked, whilst one named "gesture, tone, and speech" as the phenomena under study. In Condition 4, two participants named the effect of language on someone's personality, whilst two specified that they believed "intonation" or "tone" were the contributors to the personality judgements. Therefore, it is clear from these comments that the intonation was an obvious or attention-grabbing feature in the stimuli videos, so perhaps participants did not devote as much attention to nonverbal communication as they were expected to do. However, it should be noted that there are comments about intonation in all four conditions; this suggests that the intonation was variable across all conditions, so it was likely to have attracted equal attention in each conditions. Therefore, the effects of intonation should not have been greater in any one condition, and so the differences in the results can be interpreted in terms of the differences in gestural articulations alone. Furthermore, these comments on the spoken aspect of the advertisement confirm that, as desired, the study's aim

was obscured so that the results have been gathered without bias, as participants were not paying over attention to the gestures.

Alternatively, the adaptation of the Bem Sex Role Inventory (Bem, 1974) may have been inappropriate for the judgment task. The Bem Sex Role Inventory (BSRI) was designed as a way for individuals to rate themselves in terms of the characteristics provided. It is possible that participants are more likely to provide realistic scores when describing themselves rather than someone else. This could perhaps be due to an internalised social pressure not to judge someone in an extreme way, or perhaps because they feel that they are not familiar enough with the actor to make accurate judgements. The result might be that they err on the side of caution with scores closer to the neutral point. Indeed, one participant in Condition 4 commented that “one cannot judge about these traits from the demonstrated video”. Therefore, perhaps the ability for the BSRI characteristics to generate and reflect honest opinions has been diluted by the alteration of the self-assessment format. However, there are differences between the conditions, and one of these differences is significant, which suggests that participants were able to rate the actors in a meaningful way in response to the stimuli and could make judgements about the given characteristics.

Furthermore, in the BSRI, the participants score along a seven-point scale, ranging from 1 “never or almost never true” to 7 “almost always true” (Bem, 1974). The rating scale used in the current study was from 1 “strongly disagree” to 5 “strongly agree”, which could be said to be a more extreme rating system for the following reasons. Firstly, the BSRI gives more options for participants to provide marginal scores; as there are two points between the neutral and extreme scores. The current study provides only one “medium” option on either side of the neutral point, but if it followed a seven-point scale, perhaps a more defined picture of the participants degree of agreement or disagreement would have been achieved. Secondly, the choice of an agreement scale instead of a frequency scale could be said to be more

extreme when rating personality characteristics, as participants had to make a concrete decision about how true they thought a statement was. Alternatively, the BSRI scale from “never or almost never true” to “almost always true” allows the participants to give scores with the idea that personality is a variable notion, and qualifies the most extreme options with the adverb “almost” which reduces the strength of the judgement. Thus, again, participants may have avoided choosing the more extreme scores in this study as a result of the rating scale itself. However, it is maintained that the agreement scale was in fact more appropriate, given the nature of the stimuli. It would most likely be impossible for participants to decide if an individual “almost always” or “almost never” abides by a personality trait from a 30-second video, especially when the stimulus actor is unfamiliar to them. Therefore, the agreement scale allows participants to make their judgements based on, and about, only the stimulus video, rather than attempting to make sweeping decisions about the actor’s personality outside of the video. For example, the participants made their judgement about whether the actor was “gentle” in the video only, rather than in general life.

A final point about the appropriateness of the BSRI concerns its age. The use of the characteristics from the BSRI was contingent on the idea that the characteristics within reflected societal impressions about masculinity and femininity, and how these relate to personality traits. However, the BSRI is now over four decades old, and during this time period it is reasonable to expect a change in societal stereotypes, or at least an awareness that they are indeed stereotypes. However, as Bergen and Williams (1991, in Cross & Markus, 1993: 60) note, whilst some stereotypes tend to moderate over time, the general ideology does remain; whilst a stereotype might be less strongly associated with one sex, or perhaps even viewed as no longer exclusive to one sex, it is reasonable to believe that it will still be deemed as a feature of masculinity or femininity when enacted by either sex as a remnant of these stereotypes. In addition, the more obviously outdated stereotypes such as the feminine

characteristics “childlike” or “loves children” were removed from the list during the creation of the social judgement questionnaire. The short form of the BSRI (Bem, 1974) also removed similar items, and the results from it have been proven to have a greater reliability than the long form (Hoffman & Borders, 2001: 46). The social judgement task in the current study used even fewer items than the short form of the BSRI and chose only the most appropriate ones, so the list of traits would appear to be valid for use in modern day society.

Alternatively, the non-significant findings could be a result of the demographic which participated in the study. Whilst the number of male and female participants was equal in each condition, and the average ages for each condition were relatively similar, the nationalities varied greatly. This could have affected the interpretation of the gestures, as Chang (2015: 191) states that nonverbal behaviours are culturally normed in “specific social, relational, and geographical contexts”, and community members use these norms to interpret and judge others’ behaviours. Therefore, the presence of contrasting cultures - or even subcultures (Spence & Helmreich, 1978) - within conditions may result in more conflicting interpretations of the same phenomena. A future experiment should account for the cultural sensitivity of nonverbal behaviour when recruiting participants. However, as in the current study the participants were randomly distributed, it is assumed that there was a level of cultural variation in each condition, so this should not have affected one condition more than another.

Another comment that could be made about the participants is that they all identified as either male or female, with no participants stating a different gender. Previous research has found that gay men and lesbians are more accurate in identifying other homosexuals (Ambady et al., 1999: 545) than heterosexuals are. This theory could be extended to gender: perhaps participants who identify as transgender would be more able to perceive gender deviations from an individual’s behaviour, and therefore significant differences would have been found across conditions. It could be argued that the participants in this study were actually less

sensitive to gender identity cues than transgender participants would be due to their sex-gender normativity. However, in their study of the perception of sex-incongruent nonverbal communication, Remland et al. (1983:32) found that there was no increased discrimination by sex-typed individuals in comparison to androgynous individuals when evaluating the behaviour of those people who violate sex-roles. Therefore, it would appear that judgements made by heteronormative or sex-typed individuals are not qualitatively different to those who do not abide by gender norms, so the sample of participants used in this study should not have negatively affected the results. It is also believed that specifically seeking gender-fluid or transgender participants would make the aims of the study more transparent, which could bias the results if there is an overt awareness to gender.

6.2. Inverse composite analysis

Whilst the second analysis achieved significant results in all conditions, with medium to large effect sizes, it is a shortcoming of the study that the data had to be manipulated in this way. This section will first justify the secondary analysis before moving on to a discussion of the results and the implications that pertain to them.

As explained in the results section, the secondary analysis involved collapsing the scores in each condition so that 20 items contributed to the average, as opposed to the 10 scores used in the first analysis. This is advantageous as twice the amount of characteristics contributed to the numerical conception of the participants' perception of the actor's gender identity, providing a more robust basis for analysis. It could be argued that the manipulation of the data to create an overall score based on the raw scores of one aspect of gender identity and the inverse of the other aspect of gender identity in order to fit the research aim makes the results less reliable. However, this procedure has a theoretical basis. Masculinity and femininity are seen as distinct opposites, whether this is a binary distinction, as end points on

a spectrum of gender identity, or as “orthogonal dimensions” (Spence, Helmreich, & Stapp, 1974, in Remland, Jacobson & Jones, 1983: 25). Therefore, if participants strongly disagreed that a prototypically feminine character trait applied to an actor, it is reasonable to interpret this as strong agreement of the opposite; the actor complies more with the masculine character trait. This will now be exemplified with items that were included in the study. The feminine characteristic “shy” could be seen as antonymous for the masculine character trait “dominant” or even “assertive”; therefore, inverting the score for the feminine “shy” does not necessarily pervert the data, as it is essentially providing another score for the masculine traits. Of course, such antonymic relations are not found across all of the traits in the social judgement questionnaire inventory, but the theory behind it attains. The inverse of the score is essentially the creation of a score for the semantic differential: Mehrabian (1972: 9) used opposing items such as “active” and “passive” or “submissive” and “dominant” when investigating gestures; the secondary analysis has essentially achieved this through the manipulation of the data.

Such a manipulation of data has been observed in similar research, such as Ambady et al.’s (1999) study into how nonverbal communication can influence participants’ evaluations of an individual’s sexual orientation. The researchers reversed the heterosexuality scores and combined them with the homosexuality ratings to create a single composite variable (Ambady et al., 1999: 541) of sexual orientation. Homosexuality and heterosexuality are arguably more polarised than masculinity and femininity, so if these concepts can be combined, then the use of an inverse composite for gender identity is entirely justifiable.

The secondary analysis was effective, as significant differences were obtained for the masculinity and femininity scores in each condition. This confirms the hypothesis that different hand-shapes and gestural space configurations influenced the participants’ perceptions of gender identity, as demonstrated by their social judgements.

The results revealed that, as expected, the male-masculine condition was rated as significantly more masculine than the male-feminine condition. This suggests that, due to the presence of feminine gestures in the male-feminine conditions, the participants perceived that the actor was not acting in a masculine way, and so rated him as more feminine, regardless of biological sex. Furthermore, the female-masculine condition was rated as significantly more masculine than the female-feminine condition. This demonstrates that the presence of masculine gestures caused the participants to perceive masculinity, even when enacted by a biologically female actor. Therefore, the results confirm the idea that both males and females can enact masculinity (Connell, 1995, in Schippers, 2007: 86) which supports the dissociability of sex and gender. It also confirms Bailey and Kelly's (2015) statement that females are flexibly associated with high power or masculinity as well as low power or femininity.

Overall, this demonstrates that the two elements of the gesture articulation: the hand-shape and gestural space, caused the participants to perceive the actors as masculine, which was dissociable from their biological sex. Therefore, hand-shapes with straight fingers and open palms are perceivably masculine, which corresponds to previous research such as Rekers and Rudy (1978: 840). Furthermore, the utilisation of a wider gestural space is perceivably masculine, and affects social judgements. This finding is similar to previous research, which has found that the use of larger personal space is usually employed by men, and is therefore a masculine feature (Hewed, 1957, in Frieze & Ramsey, 1976: 136). Additionally, these results demonstrate that, even when the masculine gesture is performed by a female, it is perceived as masculine by interlocutors.

The female-feminine condition was rated significantly more feminine than the female-masculine condition. This suggests that the presence of feminine gestures contributed to the participants' perception of the actor's femininity, in combination with her biological sex. It

also suggests that the presence of masculine information in the gestures of the female-masculine condition caused participants to perceive the actor as less feminine, even though she was biologically female. Furthermore, the male-feminine condition was rated significantly more feminine than the male-masculine condition. This shows that the presence of feminine gestures caused the male actor to be rated as more feminine, despite being biologically male. This demonstrates that the enactment of femininity by males is considered as a “deviation” from sex norms (Bem, 1993, in Johnson et al., 2007: 331) which participants perceive and use to inform their social judgements. This contrasts with Bailey and Kelly’s (2015) conclusion that men were not readily associated with low power, submissive words which stereotypically index femininity. In the current study, the use of feminine gestures by a male actor provoked participants to judge him as more feminine than the male-masculine counterpart: these ratings were gathered using prompt sentences containing low power, submissive, and stereotypically feminine words, which suggests that males can be associated with such characteristics, influenced by their gestural use.

Overall, the two significant results demonstrate that the utilisation of hand-shapes with bent fingers and closed palms influences the participants’ perceptions of a person as feminine. Rekers and Rudy (1978: 840) found that females produced such hand-shapes more, and the results of the current study confirm that these gestural configurations index femininity which is perceivable to others. Furthermore, the use of a smaller gestural space contributes to participants’ perceptions of femininity in individuals of both sexes, and affects the social judgements that they make. This supports Henley’s (1977) assumption that definitions of femininity are influenced by the spatial restrictions that females’ behaviour is constrained by, as such limited personal space was perceived as feminine in both male and female actors.

As only the gestures were manipulated across conditions, this demonstrates that it is this variable which affected the participants’ perceptions, resulting in differing social

judgements. Therefore, not only can gestures convey semantic information, or social information about likability and trustworthiness (Beattie & Sale, 2012), but they can convey information about gender. These results are similar to Kozlowski et al. (2016) who found that minimal gait cues could contribute to perceptions of masculinity and femininity; in the context of this study, gesture alone was found to influence participants' perception of gender. The gender cues in the stimuli were minimal: only three gestures were used, but this was informative enough for participants to perceive the gender identity of a person that they had never encountered before.

This reaffirms the definition of gender as a socially constructed concept (Bailey & Kelly, 2015: 318), as the same actor could create a perceivably different gender identity - masculine or feminine - at two different times through the use of different gestures. If the male actor was judged as equally masculine in both conditions, or the female actor was judged as equally feminine in both conditions, this would show that gender identity is stable, and is associated with biological sex. However, as the actors could be perceived as more masculine or more feminine in different conditions, regardless of their biological sex, it demonstrates that gender is dissociable from biological sex, and is constituted in different contexts through the use of behaviours (Butler, 1998: 519), and in this case, specifically gestures.

The results from this analysis also suggest that the potential methodological issues that were raised in Section 6.1.2 were overcome by the use of a composite variable. The presence of four significant differences between conditions confirms that the video stimuli were appropriate to perceive gestural information from which to form social judgements. This complies with Gullberg & Holmqvist's (2006) finding that gestures in small-screen videos still receive attention. Furthermore, the results suggest that the adapted BSRI (Bem, 1974) was effective at providing characteristics for participants to base their social judgements upon,

as significant differences were found between the congruent and incongruent conditions. This demonstrates that the BSRI (Bem, 1974) characteristics do relate to masculinity and femininity, even in a more modern society, and that these characteristics can be evaluated in terms of other people, rather than as a self-rating scale. The demographic of participants also appears to have been appropriate, despite all 120 participants identifying as male or female. Previous research has suggested that sex-typed persons tend to have a lower tolerance for behaviour that deviates from the sex-role norms (Bem & Lenney 1976, in Remland, Jacobson, & Jones, 1983: 26). Therefore, the fact that none of the participants identified as a gender other than male or female may have been beneficial, as they may have been more sensitive to incongruent behaviour, which therefore produced larger differences in evaluations across conditions.

Therefore, it appears that the only concretely identifiable methodological issue was the method of analysis used in the primary analysis. Evidently, ten items were not sufficient enough to convey a true representation of participants' perceptions of an individual's gender identity. This issue was solved in the composite variable analysis which used 20 items and provided more robust scores.

6.3 General discussion

The results from this study add to a cohort of previous literature which demonstrates that social information, and not just semantic information, can be perceived from nonverbal behaviours. This is similar to studies such as Ambady et al. (1999), who found that participants could judge an individual's sexual orientation from exposure to thin slices of dynamic nonverbal behaviour. This highlights the importance of nonverbal communication in future studies and in real life, as it is clear that the information conveyed by gestures is highly pervasive, and interlocutors readily integrate the information from the embodied mode. The

current study demonstrates that an individual's gender identity can be perceived from nonverbal communication. This is similar to Kozlowski et al (2016), who found that gait could influence participants' judgements of a point light walker in terms of being male, female, masculine, or feminine. Kozlowski et al (2016) also found that ratings of masculinity and femininity did not map one-to-one with biological sex; the current study also achieved this result as target actors of one sex were rated differentially based on the masculinity and femininity conveyed by the nonverbal behaviours.

Whilst studies investigating the effects of nonverbal communication as a whole lead them to conclude that the mechanisms behind how participants can accurately discern social information are largely unknown (Johnson et al., 2007: 321), the current study has concretely demonstrated one specific way in which gender identity information can be perceived: through gestures. The results from this study demonstrate that gestures alone can contribute to the evaluation of an individual's gender identity. The only elements that differed between conditions were the hand-shape and gestural space with which the gestures were articulated; the other elements, both verbal and nonverbal, were controlled for to be as gender-neutral as possible.

Therefore, it can be concluded that it is the gestures which influenced the social judgements which the participants made about the actor in the stimulus videos. The male-masculine and female-masculine conditions were judged as significantly more masculine than the male-feminine and female-feminine conditions respectively. Therefore, a more expansive gestural space, straighter fingers, and open palms can be perceived as masculine, and people perceive and utilise these cues when forming social judgements about a person. The male-feminine and female-feminine conditions were judged as significantly more feminine than the male-masculine and female-masculine conditions respectively. This demonstrates that utilising a smaller gestural space, more bent or relaxed fingers, and closed palms indexes

femininity, which is perceived by interlocutors and affects the judgements that they make about a person. The participants in all conditions integrated the gender information conveyed by the gestures to form a judgement about the actor's masculinity or femininity, regardless of the biological sex of the target.

Therefore, the results of this study contribute to previous research by providing evidence of a material manifestation of nonverbal communication which can influence judgements about an individual's gender. For example, whilst Birdwhistell (1970) found that native informants could distinguish between masculine and feminine nonverbal behaviours, no particular element of their movement could be identified as contributing to the judgements. The results of the current study demonstrate how one type of nonverbal behaviour, gestures, can influence participants' evaluations of someone's gender. It could be the case that, in the previous literature, gestural configurations have contributed to the perception of gender alongside other types of nonverbal communication, but these studies have not isolated this factor; however, the fact that this minimal element of nonverbal communication is informative to influence gender evaluations by itself is significant.

6.3.1 Implications

This study demonstrated that a singular element of nonverbal communication - gestures - motivated perceptions of gender identity, which has implications for future research. Further studies could explore which other individual elements of nonverbal communication, aside from gesture, contribute to the perception of gender identity. For example, a future study could control for gesture and instead manipulate the prosody that the actors use, and have participants answer the same social judgement questionnaire to see how informative prosody is for perceptions of gender identity. If the results of this suggested study were not significant, it would demonstrate that gender identity is not perceived from prosodic information, so it

could potentially be ruled out as a contributing factor in future, more general studies researching nonverbal communication and gender. If the results were significant, it would demonstrate that prosody does provide information about an individual's gender identity, as well as gesture.

As this study employed an ecological perspective of perception, its results are highly generalisable to real-life interactions. The results of this study primarily give insight into human perception and cognition: it is clear that nonverbal behaviours, and specifically gestures, are attended to and integrated as highly informative elements in an interaction. This study contributes to the ever-growing research into gender identity by elucidating and specifying how both gender-typed and non-congruent gender identities are perceived. As participants were able to judge gestures as either masculine or feminine, it can be concluded that such gestural configurations construct gender identity.

The results would be informative for any sociocultural interaction which demands certain characteristics to be enacted. This could relate directly to gender identity: for example, a male may want to be perceived as more masculine when interacting with other men in a masculine environment. In this case, the individual should perform masculine gestures, expanding into the gestural space with straight fingers and open palms. However, as the social judgement questionnaire comprised of personality characteristics, the use of masculine or feminine gestures can be used to index these traits in social situations as well. For example, in interactions such as teaching or parenting, an individual may want to be perceived as more nurturing: in this case, the individual should utilise more feminine gestures, with the hand-shape and gestural space configurations described in this study. The interlocutor in this interaction would be able to perceive the social information and, judging from the results of this study, would judge the person as gentle and caring. Alternatively, there may be situations in which a person may wish to be judged as more assertive and dominant, such as in a job

interview. The use of masculine gestures would result in the interlocutor being judged with these traits, but furthermore, the individual would actually feel more powerful as a result of the openness of the gestures raising the testosterone levels and decreasing cortisol levels (Carney et al., 2015).

There could also be implications for the field of advertising. The semantic information conveyed by gestures is highly salient in advertising (Beattie & Shovelton, 2005), but the results from this study suggest that the social information could be facilitative as well. If advertisers want to market a product to women, they may aim to use more feminine gestures. Especially in the increasingly feminist climate of modern society, companies are attempting to break stereotypes with campaigns that diverge from hegemonic femininity. In campaigns such as these, typically masculine gestures should be employed in order to create the perception that females can be dominant and assertive as well as men. Alternatively, those trying to break stereotypes about men should use typically feminine gestures, to demonstrate that men can be caring and sensitive as well, diverging from hegemonic masculinity.

6.3.2 Future research

Future research could continue to focus on gestures, and attempt to specify which specific element of the gestural configuration contributed to the perception of gender identity. This study used both hand-shape and gestural space in order to create masculine and feminine gestures, but as Johnson et al. (2007) noted about body shape and motion in their study of sexual orientation, it is unknown which cue was more informative. A future study could, for example, only manipulate the gestural space whilst controlling for hand-shape to see if it is the expansiveness of gestures alone which contributes to masculine evaluations. Alternatively, a study could only manipulate hand-shape to investigate whether it is the bent fingers and closed palms which are most informative about femininity. If the results were not significant

when only manipulating one element of gestural articulations, it would suggest that it is the combination of different elements within the configuration of a gesture which contributes to an individual's perception of gender identity. If the results were significant, it would give an even more specific material manifestation of what part of nonverbal behaviours inform individuals about gender identity.

Moreover, the results of this study add to previous literature which suggests that social information can be perceived from gestures alone (e.g. Beattie & Sale, 2012). It is now known that perceptions of likability and trustworthiness (Beattie & Sale, 2012), and also gender identity, can be motivated by gestures. Future studies could investigate whether gestures motivate other types of social judgements. For example, a social judgement task about sexual orientation could be performed, using gestures as the informative stimuli. This would add to previous research (Ambady et al., 1999; Rule & Ambady, 2008; Rule et al., 2008) in which sexual orientation was evaluated from other elements of nonverbal communication, or nonverbal communication as a whole.

7. Conclusion

This thesis investigated the influence of gestures on perception, operationalised through the social judgements that participants made about an individual. The study used a social judgement task in which participants responded to statements about personality characteristics. These traits corresponded with masculinity and femininity. The primary analysis obtained only one significant result, but even so, this demonstrates that gestural information was perceived and integrated. The composite-variable analysis proved to be more robust and achieved four significant results. This demonstrates that information about gender identity conveyed by gestures is indeed perceived by interlocutors and affects their social judgements, confirming the hypothesis for this study.

The results from this study agree with the body of literature which states that social information can be perceived from nonverbal communication (Beattie & Sale, 2012; Ambady et al., 1999; Rule & Ambady, 2008; Rule et al., 2008). Specifically, this study found that gender could be perceived from gestures, which provides a more material manifestation for the perception of gender that was identified in studies such as Birdwhistell (1970). The results of this study have implications for future research into which specific elements of nonverbal communication contribute to social information, and also have applicability to real life interactions.

When the results from this study are taken in conjunction with previous literature, it is evident that gestures are highly informative about both semantic and social information, but more research could be, and should be, conducted.

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Appendix

1. The masculine version of the advertisement script, including gestures. Uttered words are in black text, gesture choreography is in square brackets.

Hi, I'm here to talk to you about a brand new carbonated drink, Fizz.

[begin by holding product in one hand, put the product down by end of sentence. No masculine/feminine distinction]

With one of your five-a-day in every 500ml bottle, it's everything you need for a fresh boost of energy in the day.

[arms begin at sides, forearms move up so hands nearly come together and move out quickly. masculine: as hands come together, fingers mostly straight, hands reasonably far apart at end of movement, elbows are away from sides at the end of the movement.]

It comes in three mouth-watering flavours: tropical, cranberry, and apple & blackberry. The choice is yours.

[point gesture with full hand, palm up: masculine extends arm fully/as close to full as feels natural so elbow is away from body, open/flat hand]

Everyone will be buying this fresh new drink - so why miss out?

[shrug gesture. masculine: elbows away from body (still feels natural), palms flat, fingers straight.]

Pick up Fizz in your local supermarket today!

2. The feminine version of the advertisement script, including gestures. Uttered words are in black text, gesture choreography is in square brackets.

Hi, I'm here to talk to you about a brand new carbonated drink, Fizz.

[begin by holding product in one hand, put the product down by end of sentence. No masculine/feminine distinction]

With one of your five-a-day in every 500ml bottle, it's everything you need for a fresh boost of energy in the morning.

[arms begin at sides, forearms move up so hands nearly come together and move out quickly.

feminine: after hands come together, fingers relaxed, elbows close to sides, hands not far apart at ends of movement]

It comes in three mouth-watering flavours: tropical, cranberry, and apple & blackberry. The choice is yours.

[point gesture with full hand, palm up: feminine: ballet hand (some fingers are more bent than the others), elbow close to body]

Everyone will be buying this fresh new drink - so why miss out?

[shrug gesture. feminine: elbows stay close to body, palms not quite flat so they tilt up to face actor's face, fingers not flat with palm]

Pick up Fizz in your local supermarket today!

3. The items used in the social judgement questionnaire, adapted from the Bem Sex Role Inventory (Bem, 1974), categorised by masculinity and femininity.

3.1 Feminine Items:

This person yields to others easily.

This person is shy

This person is affectionate

This person is sympathetic

This person is sensitive to other's needs

This person is understanding

This person is eager to soothe hurt feelings

This person is tender

This person is gullible

This person is gentle

3.2 Masculine Items:

This person is self-reliant

This person is defends own beliefs

This person is independent

This person is assertive

This person is analytical

This person is willing to take risks

This person is makes decisions easily

This person is dominant

This person acts as a leader

This person is competitive

4. The pseudo-randomised order used in the social judgement questionnaire:

This person is assertive

This person is gentle

This person is independent

This person is understanding

This person yields to others easily

This person is willing to take risks

This person is affectionate

This person is competitive

This person is dominant

This person is sympathetic

This person is self-reliant

This person is eager to soothe hurt feelings

This person acts as a leader

This person is tender

This person is analytical

This person is sensitive to other's needs

This person makes decisions easily

This person is gullible

This person defends their own beliefs

This person is shy