SOUTH AFRICAN GENDER STEREOTYPES: DIVIDED IN OUR INTERDEPENDENCY

by

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DECLARATION

I, Thembelani Ayanda Nyathi (student number: 68970242), declare that **SOUTH AFRICAN GENDER STEREOTYPES: DIVIDED IN OUR INTERDEPENDENCY** is my own work, and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references. I further declare that I have not previously submitted this work, or part of it, for examination at UNISA for another qualification or at any other higher education institution.

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Signature: Date: 26/02/2024

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ABSTRACT

This research project perspective addresses intergender relations from an intergroup perspective, specifically from the stereotype perspective. In three studies (N = 1048), we explored the existence of the compensation effect in the auto-, hetero, and meta-stereotypes of South African females and males. Moreover, we examined the effects of gender identification (Study 1: N = 334; Study 2: N = 238), perceived gender relations (Study 2: N = 238), and social context (Study 3: N = 476) on gender stereotypes, as well as how intergender stereotypes influence intergender behaviour mediated through emotions (Study 3: N = 476). The present results confirmed the compensation effect in males and found evidence that gender stereotypes are affected by status perceptions. Moreover, the present research showed how hetero-stereotypes directly influence intergroup behaviour and indirectly through intergroup emotions. These results have implications for understanding and researching gender stereotypes within the South African context.

Keywords: gender stereotypes, stereotype content, auto-stereotypes, hetero-stereotypes, meta-stereotypes, intergender emotions, intergender behaviour

INTRODUCTION

"She said it was all make-belief, but I thought you said maple leaves, and when she talked about the fall, I thought she talked about the season; I never understood at all", exclaimed Lekman (2004, 2:17) in a song that highlights inaccurate perceptions that can occur between females and males. Gender groups are distinct from other intergroup relations because females and males depend on each other for reproduction and building healthy families, which is essential for having a sense of belonging (Levy & Friedman, 2019). Furthermore, some community and organisational goals are easier to achieve when there are agreements on expectations and roles between females and males, especially when equality is considered (Gaur, 2006). However, the increase in divorce rate and single-parenthood in South Africa (Gumede, 2023; Statistics South Africa, 2022), and the arguments about who exercises power in interpersonal relationships, organisations, communities and politics (Reneses & Bosch, 2023; Segalo, 2015), suggest that females and males are sometimes not on the same page with regards to perceptions and expectations. At times, females express that they feel oppressed, while men show signs of feeling emasculated when certain issues are raised (Dichabe, 2017; Greig & Flood, 2020; Reneses & Bosch, 2023; Segalo, 2015), which suggests that they are at odds with each other. This research project aims to explore intergender relations within the South African context from the perspective of intergroup relations, specifically from a stereotype perspective and related research.

Research on stereotypes has spanned over a century (Stangor, 2016). When delving into the historical and early conceptualisations of stereotypes, the figure that comes to mind is Walter Lippmann, who had neither formal training in social science nor psychology (Schneider, 2004). In his seminal work "Public Opinion" (1922, p. 405), Lippmann defined stereotypes as "the

mental pictures we have about certain groups", emphasizing that these perceptions are not necessarily based on grounded personal experience. According to Lippmann (1922, p. 405), these "mental pictures" encapsulate a comprehensive image of traits perceived as attributable to a social group and its members. Importantly, he conceptualised stereotypes as cognitive errors and biases inherent in these mental images, which may not accurately reflect the actual traits of the social group and its members (Lippmann, 1922).

While the initial and prominent studies on stereotypes primarily focussed on ethnic and racial stereotypes (Katz & Braly, 1933; 1935, cited from Schneider, 2004; see also Stangor, 2016), the 1940s marked a period when systematic research on gender stereotypes became evident. For instance, Kitay (1940) explored whether the attitudes and beliefs women shared about women match those held by men in a sample of college students and found that women agreed with men that women possess more humaneness and are more emotional and less dominant than men. In the late 1940s, Fernberger (1948) assessed the traits male and female college students attribute to women and men. He found that men were perceived as intelligent and crude, while women were perceived as sensitive, talkative and less passionate by members of both gender groups (Fernberger, 1948).

In contrast to the limited and somewhat inconclusive studies on ethnic and racial stereotypes during the 1960s and 1970s, attributed in part to challenges in the conceptualization of stereotypes at the time (see Schneider, 2004, p. 11), research on gender stereotypes followed a different trajectory. Firstly, as early as the 1950s and 1960s, there were already distinct attempts to conceptualise gender stereotypes from a social norm perspective based on different characteristics of females and males in society, such as being talkative, gentle and aware of others' emotions for females and aggressiveness, independence, lack of emotions for males

(Rosenkrantz et al., 1968). Although recent research continues the departure from the social norm perspective (e.g., Eagly et al., 2020; Moya & Moya-Garófano, 2021; Ramos et al., 2018; Sczesny et al., 2019), contemporary studies expanded on it by proposing that gender stereotypes, like any social stereotype, can be both *descriptive* – referring to traits females and males are assumed to possess - and *prescriptive* - indicating the traits that females and males should or should not possess (Sczesny et al., 2019).

Secondly, starting in the 1970s, there was already a more in-depth emphasis on the theoretical conceptualisation of gender stereotype content. This period saw work such as those by Broverman et al. (1972) and Eagly and Steffen (1984), which suggested that gender stereotypical traits could be effectively represented by two dimensions: *competency* and *warmth*. While the *competency* dimension captures traits such as independence, decisiveness, self-confidence, and ambitiousness, which have been mainly attributed to males, the *warmth* dimension includes attributes like gentleness, quietness, neatness, having an interest in art and literature, and sensitiveness to the feelings of others, which have been mainly attributed to females (Broverman et al., 1972). Also, since the 1970s, gender stereotype content has been increasingly described along the *agentic* and *communality* dimensions (Eagly & Steffen, 1984). Agentic characteristics involve being assertive, self-expansive and having an urge for mastery. In contrast, communality involves traits such as selflessness, having the desire to be one with others, and being concerned with others (Eagly & Steffen, 1984). Research suggested that agency was mainly attributed to males and communality to females (Eagly & Steffen, 1984). It should be noted that a normative perspective on social roles primarily shaped the diverse conceptualisations during this period. The prescribed social roles for females and males at the

time were heavily influenced by physiological sex differences (Eagly & Steffen, 1984; Rosenkrantz et al., 1968).

Current gender stereotype research continues to build upon earlier research and maintains the distinction between agency and communion as essential themes in gender stereotype content (Eagly et al., 2020; Ramos et al., 2018; Sczesny et al., 2019). Similar to earlier conceptualisations, the agency dimension in contemporary conceptualisations still pertains to goal attainment and mastery (Eagly et al., 2020; Sczesny et al., 2019). However, present conceptualisations also include stereotype content associated with competency, assertiveness, independence, and decisiveness (Eagly et al., 2020; Sczesny et al., 2019). Likewise, the communion dimension, which continues to capture the traits directing individuals to focus on others and their well-being (Eagly et al., 2020; Sczesny et al., 2019), also integrates stereotype content associated with compassion, morality, warmth, expressiveness, and emotional sensitivity (Eagly et al., 2020; Sczesny et al., 2019). Like earlier research, contemporary studies hold that the agency dimension captures prevalent male stereotypes, while female stereotypes are dominated by content and traits captured by the communion dimension. For instance, Koenig (2018) found that male and female participants tended to ascribe communal, feminine appearance and dominance avoidance to women while attributing agentic, independent, and masculine traits, as well as interest in science, avoiding being weak, emotional, shy, and feminine in appearance, to men. These stereotypes also aligned with the descriptive norms that the participants held about the gender groups (Koenig, 2018).

Thus, like early research on gender stereotype content, contemporary research on gender stereotypes is influenced by normative social roles (Koenig & Eagly, 2014). According to the social role theory, gender stereotypes are inferred from observing men and women performing

different social roles (Koenig & Eagly, 2014). Social roles mainly evolved from physical attributes, like women's reproductive activities and men's size and strength, allowing some activities to be more efficiently performed by one gender group over the other (Sczesny et al., 2019). The social role theory further argues that traditional gendered division of roles, especially labour roles, can be divided into high-status versus low-status roles (Cuddy et al., 2008). High-status roles are associated with *agentic* traits, while low-status roles are linked with *communal* features (Sczesny et al., 2019).

Some criticism of the social role theory was based on the argument that substantial changes have occurred in women's social roles without changes in gender stereotypes (Koenig & Eagly, 2014). Koenig and Eagly (2014), who reasoned about the lack of changes in gender stereotypes despite changes in the social roles of males and females, concluded that most social role changes do not increase the demand for trait changes. More specifically, they argue that social roles are being adapted to stereotypical attributes of that gender group, which slows the change in group stereotypes because no new demands are made on the group's existing role attributes. Changes in social roles that place new demands are few, and thus, few gender group members occupy them, which might result in subtyping rather than changes in stereotype content (Koenig & Eagly, 2014). This reasoning was supported by Haines and colleagues (2016), who analysed gender stereotype content from 1983 to 2014 and found, for the US context, no significant changes in most gender stereotype content as women were still rated as more communal than men, and men were rated more agentic than women. Likewise, other meta-analytical research for the Spanish context showed a similar trend that women continued to be rated as more communal than men, whereas no differences in the agentic perceptions of men and women were found in 1985 as well as in 2018 (Moya & Moya-Garófano, 2021). Consequently,

stereotype content perceived as normative for gender groups remains mainly unchanged – even though regional differences are evident.

Understanding gender stereotypes from the stereotype content perspective requires considering the cognitive processes involved in stereotyping (Kaur & Ricciardelli, 2023). The most basic cognitive process in stereotyping is social categorization (Gaertner et al., 2016; Hugenberg & Sacco, 2008; Schneider, 2004). Social categorisation is sorting people into various social groups (Bodenhausen et al., 2012; Gaertner et al., 2016). This process is essential for efficient human functioning and is critical for all social groups (Gaertner et al., 2016). Thus, social categorisation allows perceivers to bring order into their social world (Fiske & Tablante, 2014). In the process of social categorisation, demographic characteristics, social roles, shared tasks, goals, and interests or other social cues are used to distinguish and classify individuals as belonging to a particular social category (Bodenhausen et al., 2012). Once an individual is identified and classified as belonging to a social category, the perceiver is likely to infer traits that this individual possesses, their intentions and goals, and what skills and knowledge they share with others (Bodenhausen et al., 2012). These inferences result in stereotyping. Through these cognitive categorisation processes, the perceiver quickly organises the social world and is guided in their behaviour that is assumed to be appropriate for that social group and its members (Gaertner et al., 2016; Koenig & Eagly, 2014). Therefore, social categorisation is essential in judging, deciding, and behaving in stereotype-consistent ways (Koch et al., 2016).

Social categorisation processes involve mentally representing stereotypes through prototypes, exemplars, and schemas (Stangor, 2016). Prototypes are the most studied cognitive representation of stereotypes (Hilton & Hippel, 1996), and they follow a pattern that involves the perceiver evaluating if a person fits the concept of the essential features that are assumed to be

characteristic of the concerned social category (Bodenhausen et al., 2012; Kite & Whitley Jr, 2016). Thus, if the perceived person is more typical of the prototype (i.e., prototypical), that person is assimilated into the social category (Hilton & Hippel, 1996; Kite & Whitley Jr., 2016; Operario & Fiske, 2004). This process of stereotyping is strongest when there is a minimal direct experience between the perceiver and the social category (Operario & Fiske, 2004). The prototype representation of stereotypes assumes that knowledge about stereotypes is organised hierarchically into basic-level categories (i.e., essential) and subtypes (i.e., peripheral) (Hilton & Hippel, 1996, p. 242). This hierarchical organisation has two implications: firstly, as stereotyping results from the comparison between the prototype and the individual, any distinct feature of the individual might reduce the similarity and thus increase the likelihood that perceivers fail to apply stereotypes; and secondly, the prototype model implies that stereotype change is associated with the introduction of new subtypes (Hilton & Hippel, 1996, p. 242). For instance, if there is an expectation for females to be compassionate, encountering an assertive female pilot might lead to the formation of a subtype that involves the expectation that female pilots are assertive.

Exemplars, which also play an important role in stereotype representations, imply that the perceiver does not only use abstract representations. Groups can be represented through concrete exemplars. These exemplars are usually based on actual experiences (i.e., intergroup contact) with members of the respective group (Hilton & Hippel, 1996). This stereotype representation involves comparing the perceived person with mental representations (i.e., exemplars) of actual category members (Hilton & Hippel, 1996; Operario & Fiske, 2004). When the perceived person resembles the exemplar, the characteristics of the exemplar are assigned to the person by the perceiver (Operario & Fiske, 2004). Unlike prototypes, exemplars involve variability instead of typicality and homogeneity (Operario & Fiske, 2004). Therefore, this representation

acknowledges within-group heterogeneity and the potential of stereotype change by accumulating sufficient group variability (Operario & Fiske, 2004). The exemplar that is retrieved depends on the direction of the perceiver's attention. Therefore, goals and context are important in determining and applying the exemplar (Hilton & Hippel, 1996). Two consequences result: firstly, when members of the target group are met, it is unlikely that always a particular stereotypical exemplar is activated and applied, or when the same member is encountered in different situations; and secondly, stereotype change is likely to occur due to an experience with a single counter-stereotype exemplar (Hilton & Hippel, 1996). For instance, the stereotype of men as aggressive can be internalised and stored as specific individuals embodying this characteristic (e.g., Chef Gordon Ramsey).

From the scheme perspective, stereotypes are defined as generalised and highly abstract beliefs about social groups and their members (Hilton & Hippel, 1996). In this conceptualisation, stereotypes are presented more abstractly than prototypes and exemplars (Hilton & Hippel, 1996). Because representations lack prototypicality or exemplars, schema-based stereotyping implies high assimilation; that is, stereotyping of even inconsistent individuals is likely to be substantial (Hilton & Hippel, 1996). For instance, men might be stereotyped as lacking empathy without specifically associating this perception to any instances, prototypes, or exemplars.

Due to the fundamental need to belong, people categorise others and themselves into some social groups and out of others (Gaertner et al., 2016; Reimer et al., 2020). In the process of categorising people into social groups, members of the ingroup are perceived as having minimal differences (i.e., group homogeneity; see Gaertner et al., 2016; Tajfel, 2001), while having maximal differences from members of the outgroup (Abrams & Hogg, 2013; Tajfel, 2001). This leads to forming social identities, which increases the emotional significance of

group membership and consequently impacts how stereotypes are formed (Dovidio & Jones, 2019; Gaertner et al., 2016; Reimer et al., 2020). Self-categorisation and social identity processes are best explained by the self-categorisation theory (Turner et al., 1987) and social identity theory (Tajfel & Turner, 1979), respectively.

Self-categorisation theory focuses on *how*, *when*, and *why* people categorise themselves as part of certain groups but not others (Turner et al., 1987; Reimer et al., 2020). The theory states that self-perceptions take the form of self-categorisations ranging from perceiving the self as a district individual (i.e., the individual self, Turner et al., 1987) to perceiving the self as part of a social category (i.e., the social self, Turner et al., 1987). Perceiving the self as a distinct individual means that the self is perceived as being different from other ingroup members, whereas perceiving the self as a group member means that the self is perceived to be similar to the ingroup but different from the outgroup (Turner et al., 1987). The more salient the ingroup-outgroup category/social self, the more the perceived similarity between the individual and ingroup increases, and thus, depersonalisation occurs (Turner et al., 1987).

Depersonalisation refers to the psychological process by which the self is perceived as less unique, and thus, the personal self shifts to the background (Turner et al., 1987). This is the basic process underlying social stereotyping (Turner et al., 1987). Through depersonalisation, individuals associate themselves with the ingroup prototype, which is self-stereotyping, and therefore, their perceptions shift to group-based perceptions, norms, and behaviours (Reimer et al., 2020). Stereotyping is not limited to the ingroup but also concerns the outgroup. Moreover, the degree to which people ingroup-stereotype (i.e., auto-stereotyping) and outgroup-stereotype (i.e., hetero-stereotyping) depends on the degree to which they identify with the ingroup.

Identification with the ingroup (i.e., social identity) results from both the psychological processes of cognitively grouping oneself as similar (i.e., interchangeable) with ingroup members in contrast to outgroup members (i.e., self-categorisation) and one's knowledge of belonging to a particular psychological group that has "some emotional and value significance" (Tajfel, 1974, p. 72). According to the social identity theory, an increased mental overlap between the individual and the ingroup increases the social identification with the ingroup (Tajfel & Turner, 1979). As individuals strive to enhance their self-esteem, they strive for a positive self-concept and, thus, a positive social identity (Tajfel & Turner, 1979). To achieve and maintain a positive social identity, the ingroup must be viewed as positively distinct from a relevant comparison group concerning a relevant comparison dimension (Tajfel & Turner, 1979). When positive distinctiveness is not achieved, individuals either strive to leave the ingroup (i.e., social mobility) and join a group with more positive connotations or make their ingroup more positively noticeable (e.g., change comparison dimension, Tajfel & Turner, 1979). According to Tajfel and Turner (1979), negative stereotyping and discrimination against an outgroup is one way to achieve positive distinctiveness.

Gender from a social category and, thus, intergroup perspective implies that females and males can vary in their self-categorisation and identification with their gender groups. Some people might not fully embrace the female-male gender distinctions (e.g., genderqueer; see Sczesny et al., 2019), whereas others may not internalise the stereotypes associated with their gender groups. For example, men can embrace high levels of communality, challenging the traditional low-communality stereotype (Sczesny et al., 2019). Furthermore, even those who acknowledge the existence of gender categories might still differ in their identification with these social groups. Those who strongly identify with their gender groups tend to ascribe not only

gender stereotypical traits to themselves and other ingroup members but also gender group values and norms, which in turn influence their emotions and behaviour (Sczesny et al., 2019). The cognitive processes of social and self-categorisation, as well as group identity, play a crucial role in forming stereotypes, and these processes are linked to the development of stereotype content (Fiske & Tablante, 2014; Hilton & Hippel, 1996). Stereotype content refers to category-based traits that people believe or perceive to be characteristic of social groups and individual members of these groups (David et al., 2018; Fiske & Tablante, 2014; Stangor, 2016). The most prominent theory that has conceptualized stereotype content from an intergroup perspective, thus capturing the dynamics of intergroup relations (Cuddy et al., 2008; Fiske et al., 2002), is the stereotype content model (Fiske et al., 2002).

The stereotype content model posits that *warmth* and *competence* are the two essential dimensions that underlie social perceptions, including stereotyping (Cuddy et al., 2008; Fiske et al., 2002; Fiske & Tablante, 2014). According to this model, when people encounter members of an outgroup, their initial assessment revolves around whether these outgroup members have good or bad intentions towards them and their ingroup. This initial assessment informs whether outgroup members are attributed traits such as morality, trustworthiness, sincerity, kindness, and friendliness captured by the *warmth* dimension (Cuddy et al., 2008; Fiske et al., 2002). The stereotype content model, secondly, proposes that people anticipate the outgroup members' capability to pursue the perceived intentions. This informs whether the other is attributed traits such as skill, efficacy, creativity, confidence, and intelligence captured by the competence dimension (Cuddy et al., 2008; Fiske et al., 2002). Therefore, the two dimensions of warmth and competence have a sequential and hierarchical relationship, with warmth being judged before

competence. Moreover, warmth is considered more influential on affective and behavioural outcomes (Cuddy et al., 2008; Fiske & Tablante, 2014).

According to the stereotype content model, stereotype content is a combination of perceiving groups and their members as low or high on warmth versus low or high on competence, which results in the perceptions of high warmth-high competence, low warmth-low competence, high warmth-low competence, and low warmth-high competence (Cuddy et al., 2008; Fiske et al., 2002). Most groups receive ambivalent stereotypes; that is, they are perceived as high on one dimension and low on the other (e.g., high warmth-low competence or low warmth-high competence; see Cuddy et al., 2008; Fiske et al., 2002). Groups perceived as low on warmth and high on competence are mainly outgroups in powerful positions (e.g., rich people). Groups mostly perceived as high on warmth and low on competence are considered vulnerable, like the elderly and people living with disabilities (Fiske et al., 2002). Some groups receive univalent stereotypes, meaning they are perceived as consistently high or low on warmth and competence dimensions (Cuddy et al., 2008; Fiske et al., 2002). Examples of groups perceived as low on warmth and competence are immigrants, the unemployed, and the poor (Cuddy et al., 2008). In contrast, the ingroup, its allies, and admired reference groups are commonly perceived as high on warmth and competence (Cuddy et al., 2008).

The stereotype content model also proposes a particular case of ambivalent stereotypes: the *compensation effect* (Fiske, 2018). More specifically, the compensation effect emerges as an outcome of intergroup comparisons when one social group is perceived to be high on one dimension, and the comparison group is presumed to be high on the other. For instance, group A might be perceived as warm but not competent, while group B might be perceived as competent but cold. Thus, during social perception, people distinguish two social groups comparatively on

the two fundamental dimensions of warmth and competence by contrasting them sometimes inversely (Fiske, 2018).

The consideration of intergroup comparison processes is not only the signature of the stereotype content model but also provides a theoretical framework for predicting the different consequences, both *univalent* and *ambivalent* stereotypes, including the compensation effect (Fiske, 2018), might have for intergroup relations. For instance, a *univalent* intergroup comparison outcome, such as perceiving the ingroup as high on warmth and competence relative to the outgroup, could lead to *ingroup favouritism*. Conversely, *univalent* intergroup comparison outcomes may result in *outgroup favouritism* when the outgroup is perceived as high on warmth and competence relative to the ingroup. Similarly, *ambivalent* intergroup comparison outcomes, including the compensation effect, also affect intergroup relations. In instances where two groups share ambivalent intergroup outcomes (e.g., both groups agree that group A is warm and less competent and group B is competent and less warm), suggesting a *compatible* compensation effect, positive intergroup relations are likely. On the other hand, when two groups perceive the ingroup and outgroup differently (e.g., one group perceives that group A is warm and less competent and group B is competent and less warm, whereas the other group perceives that group A is less warm but competent and group B is warm but less competent), indicating an *incompatible* compensation effect, conflicting intergroup relations are predicted.

According to Fiske (2018) and Abele et al. (2021), there are parallels between the gender stereotype themes captured by the communality-agency dimensions and the stereotype content model's warmth-competency dimensions. Fiske (2018), for instance, argues that the warmth dimension corresponds with the communality themes, and the competency dimension corresponds with the agency themes. Others, however, argued that although agency compares

with competence, it focuses more on *effective* action and, therefore, does not entirely capture competence as the latter is described as skill, efficacy, creativity, confidence, and intelligence, and can also be in the form of *potential* action (Cuddy et al., 2008). Evidence supports this argument, showing that agency and competence appear as distinct factors (Carrier et al., 2014; Koenig & Eagly, 2014; Rosette et al., 2016). However, this distinctiveness was not found with communality and warmth, but rather that warmth is a sub-category of communality (Abele et al., 2016).

Irrespective of the above-reported findings, research has shown that communion/warmth is associated with female stereotypes, while agency/competency is associated with male stereotypes (Drake et al., 2018; Eckes, 2002; Wen et al., 2020). For instance, Wen and colleagues (2020) found that masculine faces were rated higher on competence-related traits. In contrast, feminine faces were rated higher on warmth-related characteristics in a sample of male and female participants. Although research suggests a reluctance in explicitly ascribing the communality-warmth dimension to females and the agency-competency dimension to males, studies on implicit beliefs show that people respond faster to feminine faces that are matched with words conveying warmth and masculine faces that are matched with words conveying competence (Wen et al., 2020). Another study on implicit beliefs by Drake and colleagues (2018) showed that both men and women perceive women as emotional, gentle, and sensitive. In contrast, men are perceived as dominant, forceful, and logical. Likewise, Eckes (2002), who studied the perceptions of females and males about the typical female and male on the dimensions of warmth and competence, showed that the typical female is perceived as high on warmth and low on competence and the typical male is perceived as low on warmth and high on competence. Overall, these findings correspond with previous findings, stating that warmth-

related traits are mainly attributed to females, while competency-related traits are mainly attributed to males (e.g., Eagly et al., 2020; Ramos et al., 2018; Sczesny et al., 2019).

While studies focussing on gender stereotype content have offered valuable insights, they are not without limitations. Firstly, except for Cadinu and colleagues (2013), most of these studies did not distinguish between auto- and hetero-stereotypical perceptions of gender stereotype content. For instance, Eckes (2002) and Koenig (2018) studied the perceptions of females and males without considering the difference between rating one's own gender group (i.e., ingroup) and the opposite gender group (i.e., outgroup). Intergroup processes (i.e., between females and males), however, are not only influenced by stereotypes we form about the outgroup (i.e., hetero-stereotypes) but also by stereotypes we form about the ingroup (i.e., auto-stereotypes) and by stereotypes we assume outgroups share about the ingroup (i.e., meta-stereotypes; see Fu & Zhou, 2019; Stening & Everett, 1984; Triandis & Vassiliou, 1967; Yzerbyt, 2016). Thus, as much as hetero-stereotypes capture characteristics attributed to outgroups and are used to evaluate outgroup members (Fu & Zhou, 2019; Stening & Everett, 1984; Triandis & Vassiliou, 1967), they should be understood in relation to auto-stereotypes that capture characteristics that social groups identify as describing themselves, and in relation to meta-stereotypes that capture characteristics that social groups assume as being attributed by outgroups (Stening & Everett, 1984; Vezzali, 2017; Yzerbyt, 2016). Studying auto- and hetero-stereotypes also allows for exploring *the compensation effect* in gender stereotypes.

Secondly, although the stereotype content model has its roots in the social identity approach (i.e., social identity and self-categorisation theories), many of the aforementioned gender stereotype studies did not explore how identification with the gender groups influences stereotype content. As highlighted by Sczesny and colleagues (2019), some people might not

fully embrace the male-female gender distinctions, such as those who identify as genderqueer (see Sczesny et al., 2019). Additionally, some people may not internalise the stereotypes associated with their gender groups. Moreover, even among those who recognize the existence of gender categories, variations in their identification with these social groups can affect whether they attribute gender stereotypical traits to themselves and other ingroup members (Sczesny et al., 2019).

Lastly, studies on gender stereotype content have in common that they have mainly assessed perceptions on gender stereotype content of participants residing in WEIRD (Western, Educated, Industrialised, Rich, and Democratic) countries like Germany (Eckes, 2002), the USA (Drake et al., 2018; Eagly et al., 2020; Koenig, 2018), Portugal (Ramos et al., 2018), and Spain (Moya & Moya-Garófano, 2021). Intergroup processes, however, unfold within concrete social and societal contexts. Or, to quote Tajfel (1979, p. 41), "social relations do not occur in a social vacuum". For instance, one could contend that the societal context of the USA varies from other societal contexts, such as Spain, as suggested by the findings of the studies by Haines et al. (2016) and Moya and Moya-Garófano (2021). The comparison of the gender stereotype contents assessed in the 1980s and the 2010s not only indicated the relative stability of gender stereotype content but also revealed regional differences in the content of gender stereotypes. Similarly, one could argue that the South African context differs from other WEIRD contexts, with intergender relations changing over the last 30 years due to the various social transformation processes aimed at addressing Apartheid legacies, including gender inequalities (Fernandez, 2020; Phaswana, 2021).

Thus, the present research aims to overcome these limitations. In line with the stereotype content model and findings of previous studies, the present studies explored the existence of the

compensation effect in gender stereotypes. More specifically, in line with the empirical findings replicating the classic female and male gender traits as defined by the social role theory (e.g., Koenig & Eagly, 2014) and from the theoretical perspective of the stereotype content model (Fiske et al., 2002), we predicted that gender groups demonstrate a shared compensation effect when they stereotype. Consequently, we tested the hypothesis that females stereotype themselves and are stereotyped by males as warmer than competent when compared to males, whereas males stereotype themselves and are stereotyped by females as more competent than warm when compared to females (Hypothesis 1). Additionally, and in line with the social identity approach (Tajfel & Turner, 1979), we explored whether gender identification influences the compensation effect. More specifically, we hypothesised that females and males demonstrate a stronger compensation effect the more they identify with their gender ingroup (Hypothesis 2).

Comparison outcomes like *univalent* and *ambivalent* stereotypes and, thus, ingroup favouritism, outgroup favouritism, or intergroup conflicts depend on intergroup relations (Fiske, 2018). According to the stereotype content model, the two essential factors influencing how the other group is perceived in terms of warmth and/or competence in intergroup relations are the degree of *interdependence* (i.e., competition versus cooperation) and the *relative position* (i.e., status) (Cuddy et al., 2008; Fiske et al., 2002). Specifically, the model predicts that social groups perceived as competitors relative to the ingroup (i.e., low interdependence) are seen as low on warmth. In contrast, highly interdependent (i.e., cooperative) groups relative to the ingroup are perceived as high on warmth (Fiske et al., 2002). Similarly, social groups perceived as having a relatively high status are commonly seen as possessing high competence, while social groups perceived as holding a relatively low status are commonly seen as having low competence (Fiske et al., 2002).

Taking into account the structural relationship between the ingroup and the comparison outgroup aids in addressing the two functional questions concerning stereotyping, as outlined by the stereotype content model: (1) What are the intentions of the perceived other (i.e., harm or help), and (2) do they have the ability to carry out this intention? For instance, cooperative outgroups (i.e., high interdependence) are less likely to have harmful intentions attributed to them. Consequently, they are perceived as relatively high on warmth since they are seen as not hindering or threatening the ingroup's goals (Cuddy et al., 2008). Allies and admired reference groups, often considered cooperative, are frequently perceived as high on warmth (Cuddy et al., 2008). In contrast, outgroups perceived as having competitive goals evoke negative sentiments and are judged as having hostile intent, leading to a perception of lacking warmth (Cuddy et al., 2008). The relative status relations determine the answer to the question of whether the outgroup can carry out its intention because status (i.e., position) is associated or linked with the ability and power to control resources, improving as social position (Cuddy et al., 2008). Consequently, outgroups perceived as relative high-status groups are attributed high competence, as intelligence and independence are inferred from the social position (Cuddy et al., 2008).

The role of interdependency (i.e., cooperative versus competitive) and relative position (i.e., high versus low status) has been examined in different group contexts, including social class (Durante et al., 2017), ethnicity (Erhart & Hall, 2019; Grigoryev et al., 2019), and age (Vauclair et al., 2018). For instance, in the context of social class, Durante et al. (2017) found that wealthy individuals (or those from developed countries), when compared to poor individuals (or those from developing countries), are likely to be perceived as more competitive and of higher status. Consequently, they are more likely to be stereotyped as being more competent and less warm, whereas poor individuals in comparison to wealthy individuals are perceived as less

competent but warm (Durante et al., 2017; Grigoryev et al., 2019). Similar patterns in the relationship between competence and status were observed in studies on ethnic stereotypes. For instance, Erhart and Hall (2019) assessed the perceptions of white Americans regarding Native, Asian, and African Americans in terms of perceived competence, warmth, social status, and competitiveness. The results indicated that white American participants perceived Native Americans as significantly lower in social status as well as competence compared to Asian and African Americans (Erhart & Hall, 2019). Likewise, Froehlich and Schulte (2019), who studied the stereotypes of Germans about 17 immigrant groups in Germany, found that relative status predicted perceived competence. On the other hand, threat (a similar dimension to competition; see Fiske et al., 2002) negatively predicted perceived warmth. Specifically, when Germans perceived an immigrant group as a high-status group relative to Germans, the group was viewed as more competent. Conversely, when Germans perceived an immigrant group as a threat to Germans, the group was considered as lacking warmth (Froehlich & Schulte, 2019).

The perception of groups as competent or warm is also influenced by shared social identities, as those who share a social identity are often viewed as more competent and warm (Fiske et al., 2002). For instance, Grigoryev and colleagues (2019) showed that Russians perceived ethnic groups sharing Orthodox beliefs (i.e., shared social identity) as high on both warmth and competence (e.g., Belarusians and Serbians). In contrast, groups not sharing the Orthodox beliefs or with whom conflicts exist were rated low on warmth and competence (Grigoryev et al., 2019). The implication of sharing a social identity is ingroup favouritism. Ingroup favouritism was also evident in a study by Vauclair and colleagues (2018), where younger participants stereotyped older people as an outgroup, perceiving them as higher on

warmth than competence. Simultaneously, they stereotyped their ingroup (young people) as equally high on both warmth and competence dimensions.

Building on the stereotype content model's assumption on the interplay between intergroup relations and stereotypes, we hypothesised that females and males tend to hetero-stereotype the opposite gender as warmer when they perceive them as less competitive (high interdependency) relative to when perceiving them as more competitive (low interdependency) (Hypothesis 3a). In contrast, females and males tend to hetero-stereotype the opposite gender group as more competent when they perceive them as having high status relative to when they perceive them as having low status (Hypothesis 3b).

Just as stereotype content relies on the perceptions of the structural relationship between ingroup and outgroup, emotional and discrete behavioural responses (Cuddy et al., 2008), resulting in, for instance, ingroup favouritism, are also depending on the stereotype content. The stereotype content model acknowledges the link between stereotype content and emotions. More specifically, each combination of the warmth and competence dimensions is believed to trigger psychological responses in the perceiver, resulting in four different emotional responses (Cuddy et al., 2007; Fiske et al., 2002). For example, groups perceived as warm and competent evoke feelings of *admiration*, encompassing admiration and pride. In contrast, groups perceived as less warm and less competent elicit feelings of *contempt*, which includes contempt and disgust. Groups perceived as less warm but competent evoke feelings of *envy*, which includes envy and jealousy, while those perceived as warm but less competent evoke feelings of *pity*, encompassing pity and sympathy (Cuddy et al., 2008; Fiske et al., 2002).

Each combination of the warmth-competence dimensions not only elicits distinct emotions but also leads to discrete patterns of behavioural responses as outlined in the

Behaviours from Intergroup Affect and Stereotype (BIAS) map (Cuddy et al., 2007), an extension of the stereotype content model. This map delineates various behaviours based on the dimensions of warmth and competence which are active facilitation, active harm, passive facilitation, and passive harm. For instance, active facilitation involves behaviours aimed at benefitting the target group, such as promoting, helping, and befriending its members (Cuddy et al., 2007, 2008). In contrast, active harm encompasses behaviours with an explicit intent to attack and hurt the target group, including actions like sexual harassment and hate crimes (Cuddy et al., 2007, 2008). Passive facilitation involves behaviours towards a target group and its members out of obligation or convenience (Cuddy et al., 2007, 2008), such as utilising services of the outgroup or choosing to *cooperate* with group members perceived as intelligent (Cuddy et al., 2007, 2008). Passive harm includes degrading or distancing from the target group by diminishing their social worth through actions like ignoring, neglecting or *excluding* them (Cuddy et al., 2007, 2008).

The BIAS map further states that warmth perceptions predict the valence of active behaviour, meaning that perceivers tend to act *against* groups who stereotypically lacking warmth (e.g., attack as active harm) and act in favour of those groups perceived as stereotypically warm (e.g., help as active facilitation) (Cuddy et al., 2008). In contrast, competence is hypothesised as predicting the valence of passive behaviours, indicating that the perceiver is more likely to work with groups perceived as competent (e.g., cooperate as passive facilitation) and less likely to collaborate with groups perceived as incompetent (e.g., exclude as passive harm) (Cuddy et al., 2008).

Furthermore, the BIAS map posits that the emotions mentioned earlier mediate the relationship between the warmth and competence dimensions and behavioural responses (Cuddy

et al., 2007). For instance, perceiving a group as warm and competent triggers admiration, making help and cooperation (i.e., active and passive facilitation, respectively) likely behavioural responses toward group members (Cuddy et al., 2007). In contrast, groups perceived as less warm and less competent elicit feelings of contempt, which most likely prompt behavioural responses such as attack and exclusion (i.e., active and passive harm, respectively; Cuddy et al., 2007). The feelings of envy activated from perceiving a group as less warm and high on competence are most likely to result in attack or cooperation (i.e., active harm or passive facilitation, respectively), whereby pity activated from perceiving a group as warm and less competent make the behavioural responses of help or exclusion likely (i.e., active facilitation or passive harm, respectively; Cuddy et al., 2007).

Research supports the emotional and behavioural outcomes predicted by the stereotype content model and BIAS map (e.g., Canton et al., 2023; Constantin & Cuadrado, 2021; Sadler et al., 2015; Vaughn et al., 2017). For instance, immigrants perceived as high on morality (warmth) and competence are relatively more *admired* as a group (Constantin & Cuadrado, 2021). Likewise, people living with disabilities and mentally ill subgroups that were perceived as warm and competent were more likely to be *admired,* while those that were perceived as warmer and not competent were more likely to be *pitied* (Canton et al., 2023; Sadler et al., 2015). Canton and colleagues (2023) also found that competence predicted feelings of envy. Therefore, people living with disabilities that were perceived as more competent, were also *envied*. In contrast, perceiving outgroups (e.g., mentally ill) as less warm and less competent elicits feelings of *contempt* (Boysen et al., 2023). This means that higher warmth and higher competence perceptions predict admiration, higher warmth and lower competence perceptions predict

feelings of pity, and higher competence perceptions predict feelings of envy, meanwhile, lower warmth and lower competence perceptions predict feelings of contempt.

The role that stereotypes, specifically hetero-stereotypes, play in predicting behavioural outcomes through emotions, as proposed by the BIAS map, has been partially supported (Becker & Asbrock, 2012; Boysen et al., 2023; Constantin & Cuadrado, 2019). For instance, ingroup members (i.e., Spanish nationals) perceiving the outgroup (i.e., immigrants) as warm (i.e., high on morality and sociability) reported admiration, which in turn elicits active facilitation tendencies towards the outgroup (Constantin & Cuadrado, 2019). Perceiving the outgroup (i.e., mentally ill subgroups) as warmer can also elicit feelings of pity, predicting, active facilitation tendencies towards the outgroup (Sadler et al., 2015). Perceiving the outgroup (i.e., immigrants and the mentally ill) as less warm has been found to predict active harm through contempt but not envy (Boysen et al., 2023; Constantin & Cuadrado, 2019). Similar results were found in experimental studies, which showed that lack of warmth increased feelings of contempt, which predicted high intentions to actively harm the outgroup (Becker & Asbrock, 2012). Meanwhile, perceiving the outgroup as competent predicts passive facilitative behaviour through admiration but not envy (Constantin & Cuadrado, 2019). While perceptions of low competence have been found to predict passive harm behaviour through feelings of contempt but not pity (Boysen et al., 2023). Overall, these results support the prediction that the relationship between warmth and active facilitation is mediated through admiration and pity. They also support the prediction that the relationship between low warmth perceptions and active harm is mediated through contempt. Lastly, these results support the prediction that the relationship between competence perceptions and passive facilitation is mediated through admiration.

Research on the implications of gender group stereotypes on emotions and behavioural outcomes is limited. However, insights can be drawn from studies on sexual minority groups (Vaughn et al., 2017), masculine and feminine mental disorders (Boysen, 2017), and gender specific occupational roles (García-Ael et al., 2018). Consistent with the predictions from the stereotype content model and BIAS map, Vaughn and colleagues (2017) demonstrated that high competence perceptions of sexual minority men predicted increased facilitating behaviour through feelings of admiration and envy. This aligns with the findings of García-Ael and colleagues (2018), who found that those occupying male sex-typed occupational roles were perceived as competent, predicting increased passive facilitating behaviours through the feelings of admiration and envy. However, as shown by Boysen (2017), when men's traits (i.e., masculine disorders) are perceived as less warm than women's traits (i.e., feminine disorders), this predicts increased feelings of contempt and active harming behavioural tendencies. Building on the Behaviours from Intergroup Affect and Stereotype (BIAS) map (Cuddy et al., 2007) and the outlined research, we hypothesise, for gender relations that perceiving the opposite gender group as warm will predict admiration and pity which will increase facilitative behaviour (Hypothesis 4a) while perceiving the opposite gender group as less warm will predict contempt and envy which will increase harming behaviour (Hypothesis 4b). It can be further hypothesised that perceiving the opposite gender group as competent will predict admiration and envy which will increase facilitating behaviour (Hypothesis 4c), while perceiving the opposite gender group as less competent will predict contempt and pity which will increase harming behaviour (Hypothesis 4d).

The Current Research

Three studies were conducted to test the proposed hypotheses. Study 1 (N = 334) aimed to explore the existence of the compensation effect in the auto-, hetero- and meta-stereotypes of males and females. More specifically, Study 1 - which applied a cross-sectional survey design - aimed at exploring whether females stereotype themselves and are stereotyped by males as warmer than competent when compared to males, whereas males stereotype themselves and are stereotyped by females as more competent than warm when compared to females (Hypothesis 1). Furthermore, Study 1 explored the relationship between gender identification and the compensation effect. Specifically, Study 1 tested the assumption that females and males demonstrate a stronger compensation effect the more they identify with their gender ingroup (Hypothesis 2).

Study 2 (N = 238), which also applied a cross-sectional survey design, aimed not only to re-test Hypotheses 1 and 2, but also to explore the role of interdependency (i.e., competition) and relative position (i.e., status) on hetero-stereotypes. Specifically, Study 2 sought to investigate whether females and males tend to hetero-stereotype the opposite gender as warmer when they perceive them as less competitive (high interdependency) relative to when perceiving them as more competitive (low interdependency) (Hypothesis 3a) and whether females and males tend to hetero-stereotype the opposite gender group as more competent when they perceive them as having high status relative to when they perceive them as having low status (Hypothesis 3b).

Conceptualizing gender within an intergroup framework, where individuals categorise and are categorised in ingroup versus outgroup, overlooks the complexity of social identities that intersect across various categories. Research from the *crossed-categorisation perspective* emphasises that the salience of multiple and cross-sectional social categories influence people's

perceptions and judgements (Levy et al., 2017; Prati et al., 2021). Recognising this, Study 3 aimed to re-test Hypothesis 1 within both a *dichotomic* intergender context and a *crossed* intergender context. Consequently, Study 3 (N = 476) employed a combination of an experimental and cross-sectional survey design. Additionally, Study 3 sought to explore the effects of stereotypes on intergroup emotions and intergroup behaviours. Specifically, it investigated whether perceiving the opposite gender group as warm will predict admiration and pity which will increase facilitative behaviour (Hypothesis 4a), perceiving the opposite gender group as less warm will predict contempt and envy which will increase harming behaviour (Hypothesis 4b), perceiving the opposite gender group as competent will predict admiration and envy which will increase facilitating behaviour (Hypothesis 4c), while perceiving the opposite gender group as less competent will predict contempt and pity which will increase harming behaviour (Hypothesis 4d).

In all three studies, participants were conveniently identified from a pool of psychology students at a South African University and were invited to take part in *one* of the studies. Prior to the commencement of the studies, ethical approval was obtained from the College of Human Sciences Research Ethics Committee of the university (Reference number: 68970242_CREC_CHS_2021). Permission to involve psychology students as research participants was granted by the Research Permission Subcommittee of the University's Senate, Research, Innovation, Postgraduate Degrees and Commercialisation Committee (Reference number: 2021_RPSC_032).

All studies were conducted using *Qualtrics*, which is an online research platform. Potential participants received an email inviting them to participate in the respective research study. The email included a link that directed them to the introduction page. On this introduction

page, participants were informed about the purpose of the respective study, the approximate time required for participation, the voluntary nature of participation, and that they have an option to withdraw from the study at any stage. Participants' anonymity was assured. Participants were then asked to either consent or to decline to participate in the study. If the participants provided consent, they were directed to the subsequent pages containing the measurements. If the participant chose not provide consent, withdrew, and completed the study, they were directed to a page thanking them and exited from the study.

STUDY 1

The main aim of Study 1 was to investigate how female and male participants perceive their gender groups (i.e., auto-stereotype), how they perceive the outgroup (i.e., hetero-stereotype), and how they believe that the outgroup perceives the ingroup (i.e., meta-stereotype) with regards to the possessing of warmth and competency traits and whether these gender stereotypes demonstrate the compensation effect. Additionally, the study aimed to examine the influence of participants' identification with their gender groups on these perceptions. Specifically, Study 1 sought to determine whether females stereotype themselves and are stereotyped by males as warmer than competent when compared to males, while males stereotype themselves and are stereotyped by females as more competent than warm when compared to females (Hypothesis 1). The study also aimed to explore whether females and males demonstrate a stronger compensation effect the more they identify with their gender ingroup (Hypothesis 2). These hypotheses were explored using a cross-sectional survey design.

Participants

A minimum sample size of 251 was required, assuming an alpha level of .05, an effect size f(V) of .25, and a priori statistical power of .95 using 2 x 3 F-statistic (MANOVA repeated measures within and between interactions). A total of 334 conveniently approached participants completed the study, resulting in a completion rate of 93% (N = 359). The participants who did not complete the survey either exited before finishing (n = 15) or did not identify as belonging to the male or female gender group (n = 10). The final sample consisted of 212 female and 122 male participants, with ages ranged from 18 to 56 years with a mean age of 29.58 years (SD = 9.12). It is worth noting that, considering the ethnically diverse context of the study, only

participants identifying as part of the majority group (i.e., Black South Africans) within the South African context were included. The post-hoc analysis

Procedure

Upon providing consent, participants were first asked to disclose their gender, age, and ethnicity. In alignment with the study's focus, participants not identifying with binary gender groups were directed to an exit page and thanked for their participation. Participants identifying with binary gender groups were asked to answer questions concerning their auto-, hetero- and meta-gender stereotypes as well as their identification with their gender group. While the gender stereotype items within the auto-, hetero- and meta-stereotypes measures were presented randomly to the participants; the sequence of presenting the measures remained consistent for all participants. Auto-stereotypes were assessed first, followed by hetero-stereotypes, and then by meta-stereotypes. Following the assessment of stereotypes, the measure of gender ingroup identification was administered.

Measurements[1]

Gender stereotypes were assessed along the dimensions of warmth and competence (Fiske et al., 2002) and communion and agency (Hentschel et al., 2019) using adjectives as items. The dimensions of warmth, communion, competency, and agency were assessed using four items. The items for warmth included the adjectives warm, good-natured, tolerant, and sincere. The items for communion included the adjectives of understanding, kind, compassionate, and sympathetic. The items for competency included the adjectives confident,

[1] Study 1 included additional measures such as intergroup anxiety and intergroup threat, which will not be reported here as they are not relevant for the hypotheses of this research report. These measures were assessed after the gender ingroup identification measure and thus did not affect the reported findings.

independent, competitive, and intelligent. Lastly, the items for agency included the adjectives competent, task-orientated, effective, and productive. Participants were requested to provide their responses using a 5-point answer format ranging from 1 (*not at all*) to 5 (*extremely*). As guided by previous research the warmth and communion items were combined to assess the warmth dimension, whereas the competency and agency items were combined to assess the competency dimension (Abele et al., 2021; Eagly et al., 2020; Fiske, 2018; Wen et al., 2020).

More specifically, the *auto-stereotype* assessment was introduced with the following instruction: "Take a minute and think about how females [males] view females [males] in general. On the following page, you will be presented with different characteristics. Please click on the most appropriate answer". The statements of the different characteristics were presented in the following manner: "As viewed by females [males], how warm [good natured, tolerant, etc.] are females [males]?" The *warmth* and *competency* dimensions showed acceptable to excellent reliabilities for females (α =.82 and α =.70, respectively) and males (α = .85 and α = .75, respectively).

The *hetero-stereotype* assessment was introduced with the following instruction: "Now take a minute and think about how females [males] view males [females] in general. On the following page, you will be presented with different characteristics. Please click on the most appropriate answer." The statements of the different characteristics were presented in the following manner: "As viewed by females [males], how warm [good natured, tolerant, etc.] are males [females]. The warmth dimension and the competency dimension showed acceptable to excellent reliabilities for both females (α = .87 and α = .72, respectively) and males (α = .79 and α = .80, respectively).

The *meta-stereotype* assessment was introduced with the following instruction: "Now take a minute and think about how females [males] are viewed by males [females] in general. On the following page, you will be presented with different characteristics. Please click on the most appropriate answer." The statements of the different characteristics were presented in the following manner: "As viewed by males [females], how warm [good natured, tolerant etc.] are females [males]?" The *warmth* and *competency* dimensions showed good to excellent reliabilities for females ($\alpha = .85$ and $\alpha = .83$, respectively) and males ($\alpha = .90$ and $\alpha = .82$, respectively).

Exploratory factor analyses were conducted for the agency/competence and communality/warmth dimensions to control for the overlap between agency and competence and communality and warmth. According to the eigenvalues, the communality/warmth items loaded on one factor for all stereotypes, with one exception (see Table S1 in the Supplementary). According to the eigenvalues, the agency/competence items produced two or three factors (see Table S1 in the Supplementary). However, there were no clearly identifiable patterns, and the factors were never aligned with the theoretically assumed distinctions between agency and competence. Consequently, we kept the adjectives assessing agency/competence and communality/warmth combined as measures assessing the warmth dimension (including communality) and the competence dimension (including agency) for the different stereotype forms (i.e., auto-stereotype, hetero-stereotype, and meta-stereotype).

Gender ingroup identification was assessed using selected items from Leach et al.'s (2008) Group Identification Scale. The following ten items were used: "I feel a bond with females [males]", "I feel solidarity with females [males]", "I am glad to be female [male]", "I think that females [males] have a lot to be proud of", "It is pleasant to be female [male]", "The

fact that I am female [male] is an important part of my identity", "Being female [male] is an important part of how I see myself", "I have a lot in common with the average female [male]", "I am similar to the average female [male]", and "Females [Males] have a lot in common with each other" (Leach et al., 2008). Participants responded on a 5-point Likert Scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The items showed good internal consistency for females ($\alpha = .83$) and males ($\alpha = .84$).

Results

Preliminary analysis

Table 1 reports the means, standard deviations, and intercorrelations of the gender stereotype and gender identification measures for female and male participants separately. The results imply that the stereotype dimensions of warmth and competence were positively and significantly correlated within the auto-, hetero- and meta-stereotypes in both females and males. Moreover, females' identification with their gender group correlated significantly but weakly with the auto-, hetero-, and meta-stereotype dimensions of warmth and with the auto- and hetero-stereotype dimensions of competence. In contrast, males' identification with their gender group correlated significantly and mostly moderately with the auto- and meta-stereotype dimensions of competence and warmth.

Table 1.

Means, standard deviations and intercorrelations for female and male stereotypes and gender identification of female and male participants, Study 1

		1	2	3	4	5	6	7
Females	Mean	4.09	4.19	3.14	4.06	4.05	3.54	4.04
	SD	0.65	0.49	0.79	0.55	0.72	0.72	0.66
Males	Mean	3.55	4.30	4.16	3.89	3.25	4.06	4.08
	SD	0.73	0.50	0.59	0.60	0.83	0.65	0.74
1. Auto-stereotype Warmth		-	**.41*** **	.01	.34***	.64***	.50***	.44***
2. Auto-stereotype Competence		**.48*** **	-	.32***	.09	.25*	.63***	.24*
3. Hetero-stereotype Warmth		-.03	.11	-	**.29** **	.06*	.27**	.02
4. Hetero-stereotype Competence		.12	17*	**.33*** **	-	.41***	.21*	.09
5. Meta-stereotype Warmth		.39***	.16*	-.22**	.16*	-	**.60*** **	.42***
6. Meta-stereotype Competence		.06	.26***	.19*	-.03	**.42*** **	-	.39***
7 Ingroup Identification		.24**	.17*	.16*	.16*	.08	.16*	-

Note. $*p < .05$, $**p < .01$, $***p < .001$. Correlation coefficients for females are reported in the lower left part of the table. In contrast, the correlation coefficients for the males are reported in the upper right part of the table. Correlation coefficients in bold indicate intercorrelations between warmth and competence within each stereotype form.

Hypotheses testing

Hypothesis 1 posited a compensation effect in gender stereotypes in that females stereotype themselves and are stereotyped by males as warmer than competent when compared to males, whereas males stereotype themselves and are stereotyped by females as more competent than warm when compared to females. Additionally, Hypothesis 2 suggested that females and males demonstrate a stronger compensation effect the more they identify with their gender ingroup. Since Study 1 did not only assess the auto- and hetero-stereotypes and identification with the gender group but also the meta-stereotypes, this information was incorporated in the analysis. Hypotheses 1 and 2 were tested using a 2 x 3 repeated measures ANOVA with the within-subject factors of the dimensions of warmth and competence for the auto-, hetero- and meta-stereotypes and the between-subject factors of gender groups and gender identification. Given that gender identification was assessed using a continuous measure, a two-group variable for gender ingroup identification (i.e., low strong versus high strong identification) was created using a median split (Med(X)) = 4.1. To assess Hypothesis 1, the three-way interaction was examined between gender group (i.e., females versus males), the stereotype dimensions (i.e., warmth versus competence) and the stereotype form (i.e., auto-, hetero- and meta-stereotypes). To test Hypothesis 2, the four-way interaction was assessed involving gender group, gender identification group, the stereotype dimensions (i.e., warmth versus competence) and the stereotype form (i.e., auto-, hetero- and meta-stereotypes).

In the first step, we assessed the assumption of sphericity, a prerequisite for conducting repeated measures ANOVA. The results of the Mauchly's yielded statistical significance, $\chi 2(2) = 104.20$, $p < .001$, indicating a substantial difference in variances across various levels. Given that both the Greenhouse-Geisser ($\varepsilon = .756$) and the Huynh-Feldt ($\varepsilon = .768$) epsilon values exceeded

.75, we opted for the Huynh-Feldt correction. This correction is applied to adjust the degrees of freedom, resulting in a more conservative F-ratio (Field, 2018).

The tests of the within-subjects effects revealed a significant three-way interaction, $F(1.54, 411.47) = 200.82$, $p < .001$, $\eta_p^2 = .428$, between gender groups, stereotype dimensions (i.e., warmth and competence), and stereotype forms (auto-, hetero-, meta-stereotypes). Subsequent pairwise comparisons revealed that female participants perceived their group as significantly warmer (i.e., auto-stereotype) ($M = 4.11$, $SE = 0.05$) compared to perceptions of males (i.e., hetero-stereotypes) ($M = 3.12$, $SE = 0.05$), $p < .001$ (see Figure 1). Additionally, female participants rated their group as significantly more competent (i.e., auto-stereotype) ($M = 4.20$, $SE = 0.04$) than they rated males to be (i.e., hetero-stereotypes) ($M = 4.05$, $SE = 0.04$), $p = .018$ (see Figure 1). In contrast, male participants perceived their own gender group as less warm (i.e., auto-stereotypes) ($M = 3.52$, $SE = 0.07$) compared to their stereotyped view of females (i.e., hetero-stereotype) ($M = 4.20$, $SE = 0.08$), $p < .001$ (see Figure 2). Moreover, male participants regarded their group as significantly more competent (i.e., auto-stereotype) ($M = 4.33$, $SE = 0.05$) compared to their perceptions of female competence (i.e., hetero-stereotypes) ($M = 3.88$, $SE = 0.06$), $p < .001$ (see Figure 2). These results suggest that female participants share a *univalent* stereotype characterised by ingroup favouritism, while male participants demonstrate an *ambivalent* stereotype indicative of a compensation effect.

Furthermore, when considering the meta-stereotypes, the findings revealed that female participants indicated that males perceive them as significantly warmer (i.e., meta-stereotypes) ($M = 4.06$, $SE = 0.06$) than competent ($M = 3.53$, $SE = 0.05$), $p < .001$. In contrast, male participants report that females perceive them as more competent ($M = 4.04$, $SE = 0.07$) than

warm (M = 3.22, SE = 0.08), $p < .001$ (see Figure 3). The latter suggests that from the male participants' standpoint, the compensation effect is *compatible.*

Figure 1.

Estimated marginal means of warmth and competence stereotypes for females, Study 1

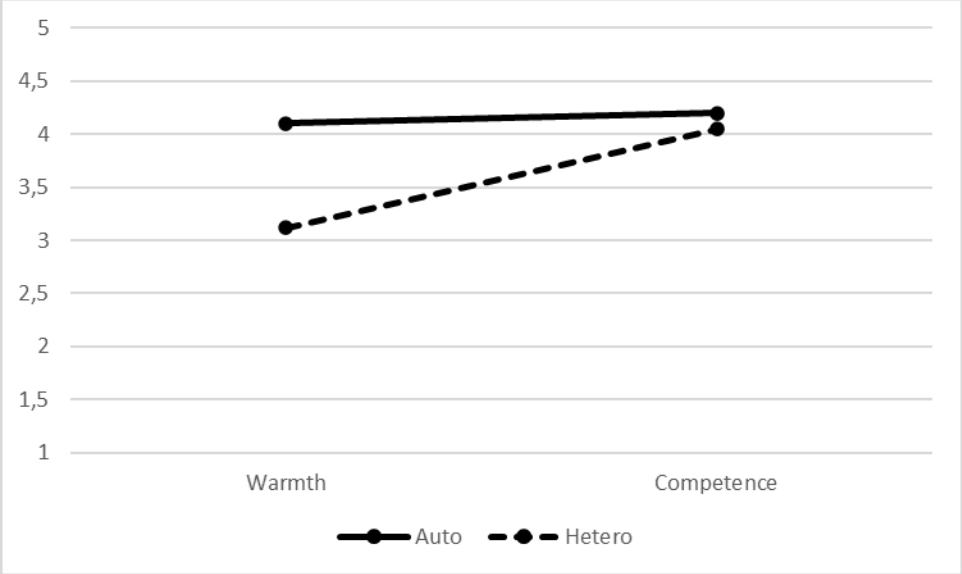


Figure 2.

Estimated marginal means of warmth and competence stereotypes for males, Study 1

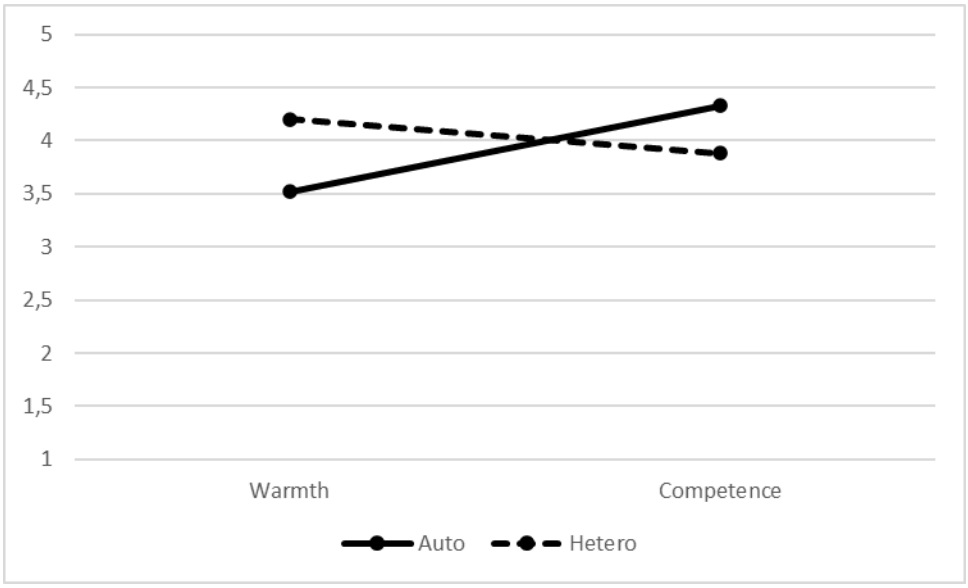
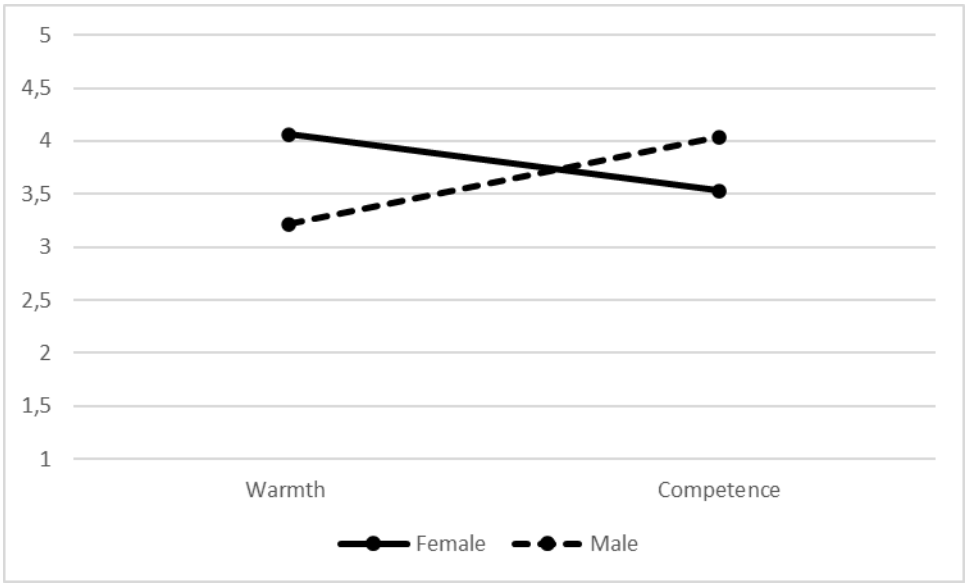


Figure 3.

Estimated marginal means of meta-stereotypes for females and males, Study 1



To summarise, the hypothesised compensation effect in gender stereotypes (Hypothesis 1) was found in male participants as they auto-stereotyped their group as less warm compared to how warm females were, and auto-stereotyped their group as more competent compared to how

competent they hetero-stereotyped females to be. In contrast, females displayed ingroup favouritism as they auto-stereotyped their group as higher on both warmth and competence, and hetero-stereotyped males as lower on both dimensions.

To test Hypothesis 2, we focussed the analysis on the four-way interaction between the gender groups, gender identification groups, stereotype dimensions (i.e., warmth and competence), and stereotype forms (auto-, hetero-, meta-stereotypes). This four-way interaction revealed to be statistically significant, $F(1.54, 411.47) = 5.08$, $p = .012$, $\eta_p^2 = .019$. The effect of gender identification was found to be statistically significant in females concerning competence but not warmth. Specifically, the pairwise comparisons showed that both females strongly identifying and those less strongly identifying with their gender group perceived their group as significantly warmer (i.e., auto-stereotypes) ($M = 4.26$, $SE = 0.07$ and $M = 3.97$, $SE = 0.07$, respectively) compared to their perceptions of males (i.e., hetero-stereotypes) ($M = 3.30$, $SE = 0.08$ and $M = 2.94$, $SE = 0.08$, respectively), $p < .001$ (see Figure 4 and 5). Meanwhile, females strongly identifying with their gender group perceived their group as significantly more competent (i.e. auto-stereotypes) ($M = 4.30$, $SE = 0.05$) than they perceived males to be (i.e. hetero-stereotypes) ($M = 4.09$, $SE = 0.06$), $p = .03$ (see Figure 4). In contrast, those less strongly identifying with their female gender group perceived their group as competent (i.e. auto-stereotypes) ($M = 4.11$, $SE = 0.05$) as they perceived males to be (i.e. hetero-stereotypes) ($M = 4.01$, $SE = 0.06$), $p = .60$ (see Figure 5).

On the other hand, gender identification for male participants did not impact their stereotypical perception on females. Both males strongly identifying and less strongly identifying with their gender group perceived their group as significantly less warm (i.e., auto-stereotypes) ($M = 3.76$, $SE = 0.09$ and $M = 3.28$, $SE = 0.10$, respectively) than they stereotyped females to be

(i.e., hetero-stereotypes) (M = 4.18, SE = 0.10 and M = 4.22, SE = 0.11, respectively), p = .005 and p < .001, respectively. Additionally, they perceived their group as significantly more competent (i.e., auto-stereotypes) (M = 4.40, SE = 0.06 and M = 4.25, SE = 0.07, respectively) compared to how competent they perceived females to be (i.e., hetero-stereotypes) (M = 3.96, SE = 0.08 and M = 3.80, SE = 0.08, respectively), p < .001 (see Figure 6 and 7).

Figure 4.

Estimated marginal means of warmth and competence stereotypes for females with strong ingroup identification, Study 1

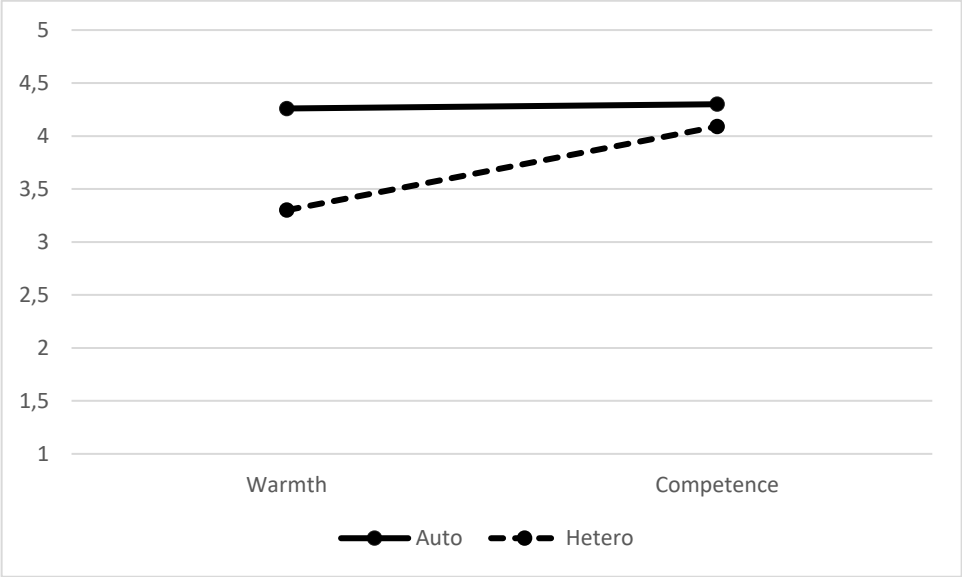


Figure 5.

Estimated marginal means of warmth and competence stereotypes for females with less strong ingroup identification, Study 1

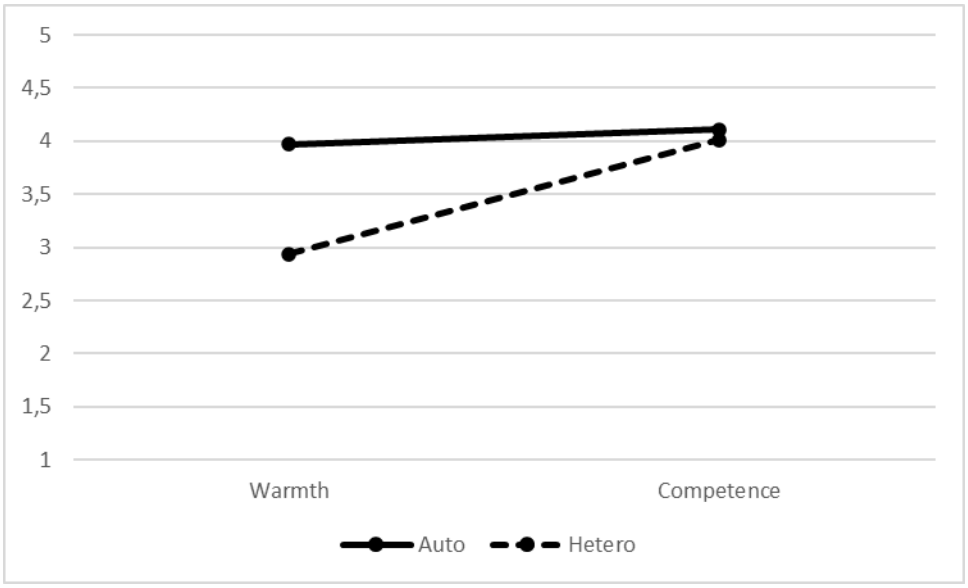


Figure 6.

Estimated marginal means of warmth and competence stereotypes for males with strong ingroup identification, Study 1

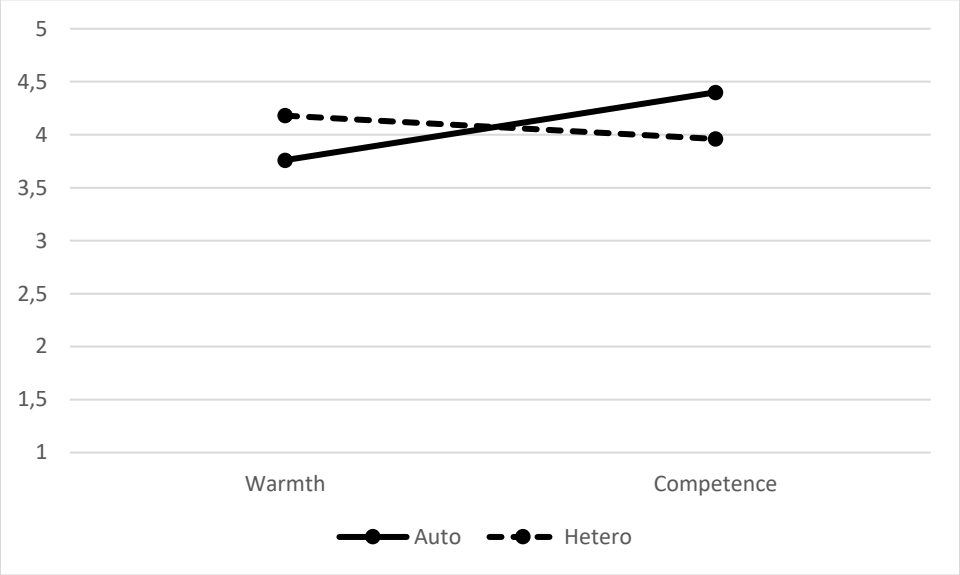
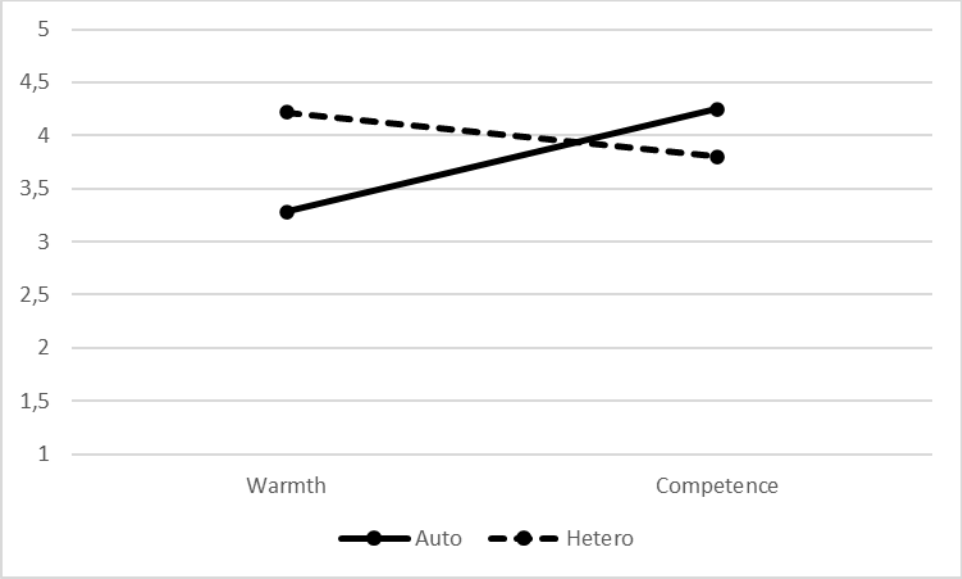


Figure 7.

Estimated marginal means of warmth and competence stereotypes for males with less strong ingroup identification, Study 1



In conclusion, the hypothesis suggesting a stronger compensation effect with increased gender identification (Hypothesis 2) was not substantiated. This lack of support refers to, firstly, females did not show a compensation effect in their auto- and hetero-stereotypes. Secondly, although there was a compensation effect in the auto- and hetero-stereotypes held by males, ingroup identification did not exert an influence on it.

Moreover, no significant effects were observed concerning gender ingroup identification and meta-stereotypes. Specifically, female participants, regardless of whether they strongly or less strongly identified with their gender group, reported that males perceive them (i.e., meta-stereotypes) as significantly warmer (M = 4.07, SE = 0.08 and M = 4.04, SE = 0.08, respectively) than competent (M = 3.46, SE = 0.07 and M = 3.61, SE = 0.08, respectively) ($p < .001$).

Similarly, male participants reported – irrespective of their level of identification with their gender group – that they are perceived by females (i.e., meta-stereotypes) as more competent (M = 3.86, SE = 0.10 and M = 3.96, SE = 0.08, respectively) than warm (M = 2.97, SE = 0.11 and M = 3.47, SE = 0.10, respectively) ($p < .001$).

Discussion

The aim of Study 1 was to explore female and male auto-, hetero- and meta-stereotypes, more specifically to explore if a compensation effect exists in our sample (Hypothesis 1) and whether ingroup identification increases this compensation effect (Hypothesis 2). The results of Study 1 indicate that the compensation effect was solely evident within the male sample and remained unaffected by the degree of identification with their gender group. However, the latter finding might be attributed to our operationalisation of gender identification, which employed the median split that – because of the skewed distribution – could only distinguish between participants who somehow to strongly identified with their gender groups and those who very strongly identified with their gender groups. In contrast, female participants did not exhibit this compensation effect. Although they acknowledged being perceived by men to be relatively warmer but less competent (i.e., meta-stereotype), reflecting the compensation effect observed in male participants, they demonstrated ingroup favouritism. Specifically, females tended to perceive themselves (i.e., auto-stereotype) as warmer and more competent compared to their perception of males (i.e., hetero-stereotype). This ingroup favouritism was particularly notable in the realm of competence stereotypes, as stronger identification among females with their gender group positively influenced their perception. The stronger females identified with their gender group, the more they perceived their group (i.e., auto-stereotypes) as competent compared to how competent they perceived males to be (i.e., hetero-stereotypes).

The outcomes of Study 1 imply that, within the current context, gender groups exhibit both univalent and ambivalent stereotypes when stereotyping each other. Specifically, females tend to embrace univalent stereotypes, favouring the ingroup. Conversely, males demonstrate a compensation effect, reflecting an ambivalent stereotype. This ambivalent stereotype observed in males aligns with the predictions of the stereotype content model (Fiske et al., 2002), which posits that certain groups are subject to ambivalent stereotypes.

Considerations of auto-, hetero-, and meta-stereotypes provide a comprehensive understanding of the complexity of intergender relations. These dimensions of stereotyping not only reveal how females and males perceive themselves (i.e., auto-stereotype) and the other (i.e., hetero-stereotype) but, most importantly, how they assume to be stereotyped by the other gender (i.e., meta-stereotype). Before delving into how these univalent and ambivalent stereotypes influence intergroup emotions and behaviours, it is imperative to replicate the stereotype patterns from this study. Additionally, exploring how the auto-, hetero-, and meta-stereotypes interrelate with perceived interdependency and status of the intergender relations is crucial. To address these objectives, we conducted a second study, aiming at re-testing Hypotheses 1 and 2 while also investigating the influence of interdependency (i.e., competition) and relative position (i.e., status) on hetero-stereotypes.

STUDY 2

Similar to Study 1, Study 2 utilised a cross-sectional survey design to investigate whether females auto-stereotype their gender group as warmer compared to how warm they hetero-stereotype males to be, but auto-stereotype their gender group as less competent compared to how competent they hetero-stereotype males to be, whereas males auto-stereotype their gender group as less warm compared to how warm they hetero-stereotype females to be, but auto-stereotype their gender group as more competent compared to how competent they hetero-stereotyped females to be (Hypothesis 1). We further re-tested the hypothesis that females and males exhibit a stronger compensation effect when they identify strongly with their gender ingroup (Hypothesis 2). Additionally, Study 2 aimed to establish connections between interdependency (i.e., competition) and relative position (i.e., status) and hetero-stereotypes. Specifically, it explored whether females and males are inclined to hetero-stereotype the opposite gender as warmer when perceiving them as less competitive (high interdependency). Simultaneously, they were expected more likely to hetero-stereotype them as less warm when perceiving them as more competitive (low interdependency) (Hypothesis 3a). Moreover, Study 2 explored whether females and males are prone to hetero-stereotype the opposite gender group as more competent when perceiving them as having high status and less competent when perceiving them as having low status (Hypothesis 3b).

Participants

A minimum sample size of 251 was required, assuming an alpha level of .05, an effect size f(V) of .25, and an a priori statistical power of .95 using a 2 x 3 F-statistic (MANOVA repeated measures within and between interactions). In total, 243 participants started the study, with five participants were excluded because they did not identify themselves as belonging to

either the female or male gender group. The final sample consisted of 160 female and 78 male participants. The participants' ages ranged from 18 to 54 years, with a mean age of 28.56 (*SD* = 7.62). Like in Study 1, Study 2 only considered members of the majority group (i.e., Black South Africans).

Procedure

The procedures as Study 2 closely mirrored those of Study 1. Different to Study 1, the gender group identification measure was followed by gender group competition and gender group status, respectively.

Measurements

Gender stereotypes were assessed as in Study 1. The warmth dimension of the auto-stereotype measure showed good reliabilities for both females (α = .82) and males (α = .80). The competence dimension of the auto-stereotype measure showed acceptable reliability for males (*α* = .70), however, the reliability for females was rather low (α = .64). The corrected item total correlation of item, "As viewed by females, how competitive are females" was rather low (*r* = .2). To make, however, the results comparable, we decided to keep this item in the scale. The *hetero-stereotype* warmth and competence measures showed good to acceptable reliabilities for both females (α = .83 and α = .67, respectively) and acceptable reliabilities for males (α = .80 and α = .82, respectively). Likewise, the *meta-stereotype* measures of warmth and competence showed good to excellent reliabilities for both females (α = .82 and α = .85, respectively) and males (α = .90 and α = .84, respectively).

As in Study 1, exploratory factor analyses were conducted for the agency/competence and communality/warmth dimensions to control for the overlap between agency and competence,

and communality and warmth. According to the eigenvalues, the communality/warmth items loaded on one factor for all the stereotypes, with one exception (see Table S2 in the Supplementary). The agency/competence items produced one, two or three factors, as per eigenvalues (see Tables S2 in the Supplementary). However, there were no clear identifiable patterns, and the factors were never aligned with the theoretically assumed distinctions between agency and competence. Consequently, we kept the adjectives assessing agency/competence and communality/warmth combined as measures assessing the warmth dimension (including communality) and the competence dimension (including agency) for the different stereotype forms (i.e., auto-stereotype, hetero-stereotype, and meta-stereotype).

Gender ingroup identification was assessed using selected items from Leach et al.'s (2008) Group Identification Scale. Different to Study 1, Study 2 used four items : "I feel a bond with females [males]", "I am glad to be female [male]", "I think that females [males] have a lot to be proud of" and "The fact that I am female [male] is an important part of my identity" (Leach et al., 2008). Participants responded on a 5-point Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The items showed low internal consistency ($\alpha = .62$); however, the corrected item total correlations of all of items ranged from medium to strong ($r = .30$ to $r = .50$). The low internal consistency might be attributed to the few items used in this measurement.

Interdependency was assessed using items adapted from the competition scale proposed by Fiske and colleagues (2002) in the stereotype content model (Fiske et al., 2002). The following three items were used: "If males [females] get special breaks (such as preference in hiring decisions), this is likely to make things more difficult for us females [males]", "The more power males [females] have, the less power females [males] are likely to have", and "Resources that go to males [females] are likely to take away from the resources of females [males]". Based

on these items, an outgroup *interdependency* measure was computed based on the perspectives of both female and male participants. The items of the newly created outgroup *interdependency* measure showed acceptable internal consistency ($\alpha = .74$).

Relative status was assessed using items adapted from the status scale again proposed by Fiske and colleagues (2002) in the stereotype content model (Fiske et al., 2002). The following three items were used: "How prestigious are the jobs typically achieved by males [females]?", "How economically successful have males [females] been?", and "How well educated are males [females]?". Based on these items an outgroup *relative status* measure was computed based on the perspectives of both female and male participants. The internal consistency for this newly computed variable was acceptable ($\alpha = .69$).

Results

Preliminary analysis

First, we summarized descriptively the data of the stereotypes, gender ingroup identification, outgroup competition and outgroup status (Tables 2 and 3). Table 2 reports the means, standard deviations, and intercorrelations of the gender stereotype and gender identification measures for females and males separately. Like in Study 1, the results show that the stereotype dimensions of warmth and competence were positively and significantly correlated within the auto-, hetero- and meta-stereotypes in both female and male participants. The results also show that females' identification with their gender group correlated significantly but weakly with the auto-stereotype dimensions of warmth and competence and meta-stereotype dimension of competence. This is different to the results of Study 1 which showed further correlations of females' identification with hetero-stereotype. In contrast, males' identification

with their gender group only correlated significantly with auto-stereotype dimensions of warmth and competence, the correlations were medium and weak, respectively. This is also different to the results of Study 1 which showed further correlation of males' identification with meta-stereotypes.

Table 2.

Means, standard deviations and intercorrelations for female and male stereotypes and gender identification of female and male participants, Study 2

		1	2	3	4	5	6	7
Females	Mean	4.11	4.23	3.18	3.93	4.03	3.72	4.47
	SD	0.64	0.45	0.73	0.55	0.71	0.79	0.61
Males	Mean	3.57	4.25	4.14	3.89	3.54	4.08	4.27
	SD	0.66	0.52	0.64	0.64	0.81	0.68	0.77
1. Auto-stereotype Warmth		-	**.46*** **	.03	.31**	.61***	.36**	.36**
2. Auto-stereotype Competence		**.38*** **	-	.36**	.29*	.29*	.54***	.11*
3. Hetero-stereotype Warmth		.14	.19*	-	**.56** **	.22	.42***	.08
4. Hetero-stereotype Competence		.19*	15	**.37*** **	-	.13	.20	.11
5. Meta-stereotype Warmth		.51***	.29***	.11	.19*	-	**.53*** **	.21
6. Meta-stereotype Competence		.34***	.35***	.13	.06	**.49*** **	-	.20
7 Ingroup Identification		.27**	.34***	.14	.07	.09	.24**	-

Note. $*p < .05$, $**p <. 01$, $***p < .001$. Correlation coefficients for females are reported in the lower left part of the table while the correlation coefficients for the males are reported in the

upper right part of the table. Correlation coefficients in bold indicate intercorrelations between warmth and competence within each stereotype form.

Table 3 reports the means, standard deviations, and intercorrelations of the hetero-stereotypes, outgroup competitiveness and outgroup status for females and males separately. The results show that the warmth and competence hetero-stereotypes positively and significantly correlated with each other in both female and male participants. The results also showed that there were positive and significant correlations between competence hetero-stereotypes and status for both females and males, whereas there were no significant correlations between warmth hetero-stereotypes and outgroup competitiveness for both groups.

Table 3.

Means, standard deviations and intercorrelations for hetero-stereotypes, outgroup competitiveness and outgroup status of female and male participants, Study 2

		1	2	3	4
Females	Mean	3.18	3.93	3.62	4.02
	SD	0.73	0.55	1.09	0.71
Males	Mean	4.14	3.89	3.36	3.57
	SD	0.64	0.64	1.12	0.95
1. Hetero-stereotype Warmth		-	.57***	-.09	.20
2. Hetero-stereotype Competence		.37***	-	.02	.39**
3. Outgroup Competitiveness		-.11	.03	-	.46***
4. Outgroup Status		.25**	.33***	.09	-

Note. $*p < .05$, $**p <. 01$, $***p < .001$. Correlation coefficients for females are reported in the lower left part of the table while the correlation coefficients for the males are reported in the upper right part of the table.

Hypothesis testing

Similar to Study 1, Study 2 not only evaluated the auto- and hetero-stereotypes and the identification with the gender group, but also incorporated the meta-stereotypes. This information was integrated in the analysis for testing Hypothesis 1 and 2. A 2 x 3 repeated measures ANOVA was employed, incorporating the within-subject factors of the dimensions of warmth and competence for the auto-, hetero- and meta-stereotypes as well as the between-subject factors of male and female gender groups and gender identification groups. Given the continuous nature of the gender identification measure, a two-group variable for gender ingroup identification (i.e., low strong versus high strong identification) was established using a median split (Med(X)) = 4.5. To test Hypothesis 1, the three-way interaction between gender group (i.e., male versus females), the stereotype dimensions (i.e., warmth versus competence) and the stereotype form (i.e., auto-, hetero- and meta-stereotypes) was assessed. For Hypothesis 2, the four-way interaction between gender group, gender identification group, the stereotype dimensions (i.e., warmth versus competence) and the stereotype form (i.e., auto-, hetero- and meta-stereotypes) was assessed.

In the first step, we assessed the assumption of sphericity required for repeated measures ANOVA. The results of the Mauchly's test were statistically significant, $\chi 2(2) = 18.75$, $p < .001$, indicating that the variances of the different levels were significantly different. Given that the epsilon values (ε) for both the Greenhouse-Geisser ($\varepsilon = .914$) and the Huynh-Feldt ($\varepsilon = .937$) exceeded .75, we chose to apply the Huynh-Feldt correction. This correction was employed to adjust the degrees of freedom, leading to a more conservative F-ratio (Field, 2018).

The tests of the within-subjects effects revealed a significant three-way interaction, $F(1.87, 357.93) = 92.81$, $p < .001$, $\eta_p^2 = .327$, between gender groups, stereotype dimensions

(i.e., warmth and competence), and stereotype forms (auto-, hetero-, meta-stereotypes). Subsequent pairwise comparisons did not support Hypothesis 1 for female participants. Although female participants viewed their group as significantly warmer (i.e., auto-stereotype) (M = 4.04, SE = 0.06) compared to how warm they perceive males to be (i.e., hetero-stereotypes) (M = 3.15, SE = 0.07), $p < .001$ (see Figure 8), they also viewed females as significantly more competent (i.e., auto-stereotype) (M = 4.18, SE = 0.04) than they viewed males to be (i.e., hetero-stereotypes) (M = 3.95, SE = 0.06), $p = .001$ (see Figure 8). In contrast, Hypothesis 1 was supported for male participants who viewed their gender group as less warm (i.e., auto-stereotypes) (M = 3.54, SE = 0.08), than the warmth attributed to females (i.e., hetero-stereotype) (M = 4.14, SE = 0.09), $p < .001$ (see Figure 9). Additionally, they viewed their group as significantly more competent (i.e., auto-stereotype) (M = 4.24, SE = 0.06) than they perceived females to be (i.e., hetero-stereotypes) (M = 3.90, SE = 0.08), $p < .001$ (see Figure 9). Overall, consistent with the findings of Study 1, the results of Study 2 support Hypothesis 1 for the male sample, suggesting that male participants hold *ambivalent* stereotypes described as a compensation effect. Conversely, females exhibit *univalent* stereotypes characterised as ingroup favouritism.

Moreover, when considering the meta-stereotypes the results showed that female participants report that males perceive them as significantly warmer (i.e., meta-stereotypes) (M = 4.02, SE = 0.07) than competent (M = 3.68, SE = 0.07), $p < .001$, whereas male participants report that females perceive them as more competent (M = 4.06, SE = 0.10) than warm (M = 3.48, SE = 0.09), $p < .001$ (see Figure 10). Like in Study 1, the meta-stereotypes held by males suggest that males perceive that the compensation effect is *compatible*.

Figure 8.

Estimated marginal means of warmth and competence stereotypes for females, Study 2

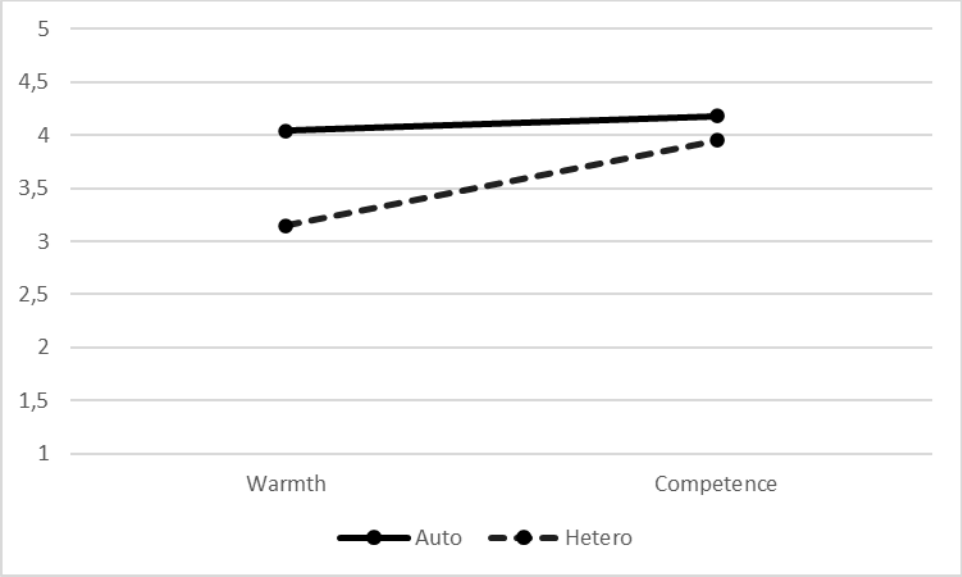


Figure 9.

Estimated marginal means of warmth and competence stereotypes for males, Study 2

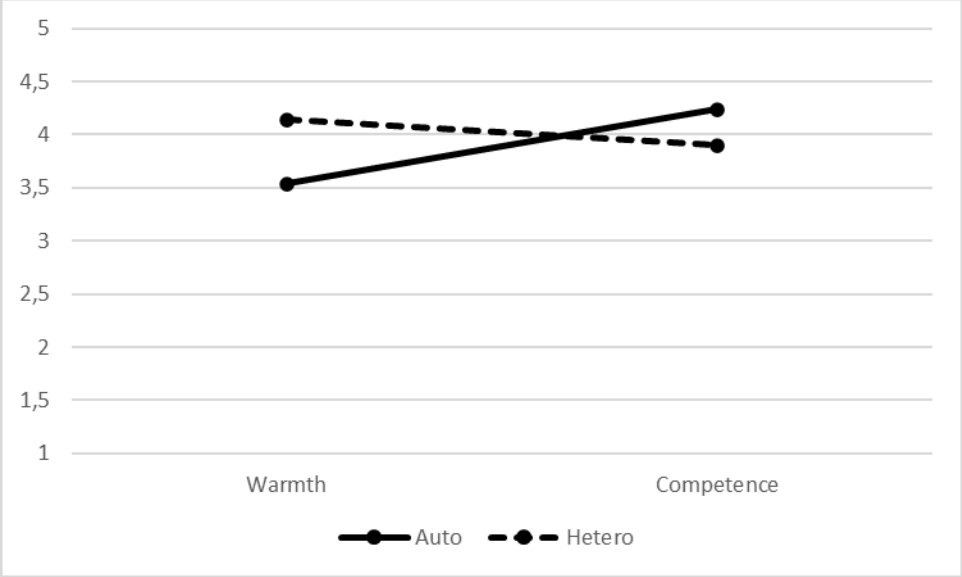
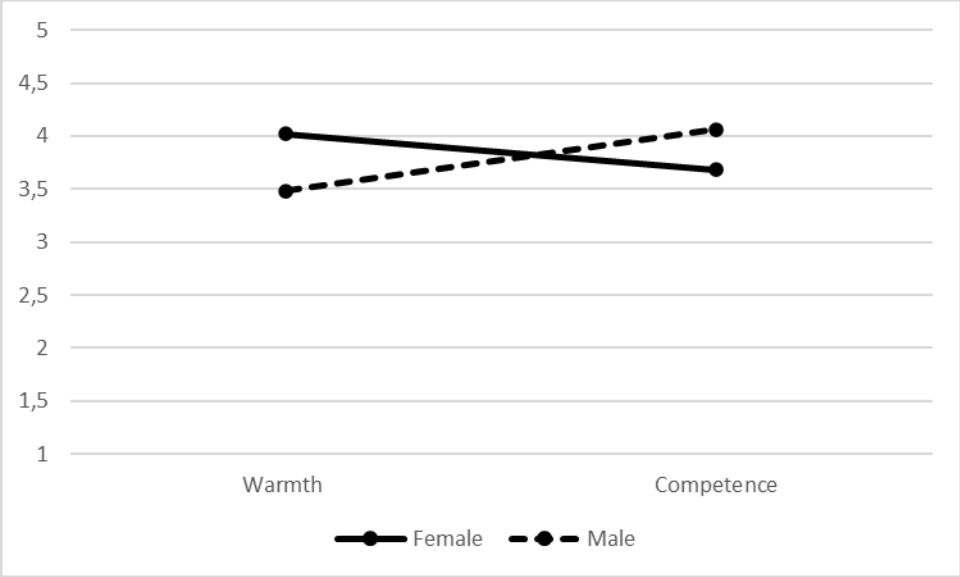


Figure 10.

Estimated marginal means of meta-stereotypes for females and males, Study 2



In summary, akin to the findings in Study 1, the results of Study 2 support the hypothesised compensation effect in gender stereotypes (Hypothesis 1) among male participants. They exhibited a tendency to auto-stereotype their group as less warm compared to how warm they perceive females to be, while simultaneously auto-stereotyping their group as more competent compared to how competent they hetero-stereotype females to be. In contrast, females demonstrated ingroup favouritism because they exhibited a tendency to auto-stereotype their group as higher on both warmth and competence, while simultaneously hetero-stereotyping males as lower on both dimensions.

To test Hypothesis 2, we examined the four-way interaction between the gender groups, gender identification groups, stereotype dimensions (i.e., warmth and competence), and stereotype forms (auto-, hetero-, meta-stereotypes), which, unlike in Study 1, was found to be

marginally significant, $F(1.87, 357.93) = 2.67$, $p = .073$, $\eta_p^2 = .014$. Subsequent pairwise comparisons yielded an effect of gender identification to be statistically significant in females with regards to competence but not warmth. Specifically, the pairwise showed that both females strongly identifying and less strongly identifying with their gender group perceived their group as significantly warmer (i.e., auto-stereotypes) ($M = 4.22$, $SE = 0.07$ and $M = 3.86$, $SE = 0.10$, respectively) compared to how warm they perceived males to be (i.e., hetero-stereotypes) ($M = 3.23$, $SE = 0.08$ and $M = 3.06$, $SE = 0.11$, respectively), $p_s < .001$ (see Figure 11 and 12). In line with Study 1's findings, females who identified strongly with their gender group in Study 2 perceived their group as significantly more competent (i.e. auto-stereotypes) ($M = 4.29$, $SE = 0.05$) than they perceived males to be (i.e. hetero-stereotypes) ($M = 3.97$, $SE = 0.05$), $p < .001$ (see Figure 11). Meanwhile, those identifying less strongly reported to perceive their group as competent (i.e. auto-stereotypes) ($M = 4.06$, $SE = 0.07$) as they perceive males to be (i.e. hetero-stereotypes) ($M = 3.92$, $SE = 0.09$), $p = .50$ (see Figure 12).

In contrast and divergent from Study 1, males who strongly identified with their gender group reported to perceive their gender group as warm (i.e. auto-stereotypes) ($M = 3.81$, $SE = 0.10$) as they perceive females to be (i.e. hetero-stereotypes) ($M = 4.09$, $SE = 0.12$), $p = .17$ (see Figure 13). Conversely, those identifying less strongly with gender group demonstrated patterns similar to Study 1. Perceiving their group as significantly less warm (i.e. auto-stereotypes) ($M = 3.27$, $SE = 0.12$) than they stereotyped females to be (i.e. hetero-stereotypes) ($M = 4.18$, $SE = 0.13$), $p < .001$. Moreover, males strongly identifying with their male gender group perceived their group as significantly more competent (i.e. auto-stereotypes) ($M = 4.31$, $SE = 0.08$) than they perceived females to be (i.e. hetero-stereotypes) ($M = 3.86$, $SE = 0.10$), $p < .001$, while those identifying less strongly reported perceiving their group as competent (i.e. auto-

stereotypes) (M = 4.17, SE = 0.09) as females to be (i.e. hetero-stereotypes) (M = 3.94, SE = 0.11), p = .21 (see Figure 14).

Figure 11.

Estimated marginal means of warmth and competence stereotypes for females with strong ingroup identification, Study 2

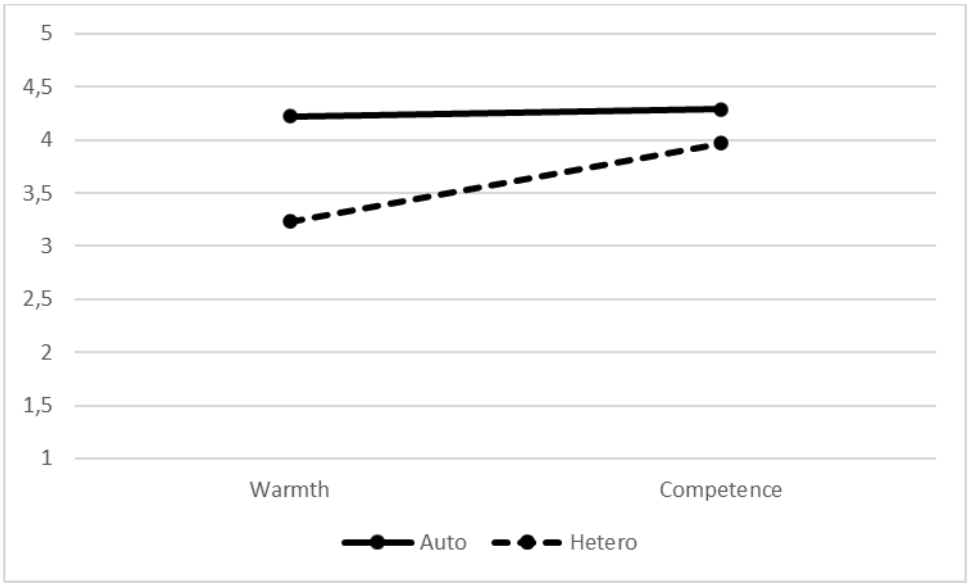


Figure 12.

Estimated marginal means of warmth and competence stereotypes for females with less strong ingroup identification, Study 2

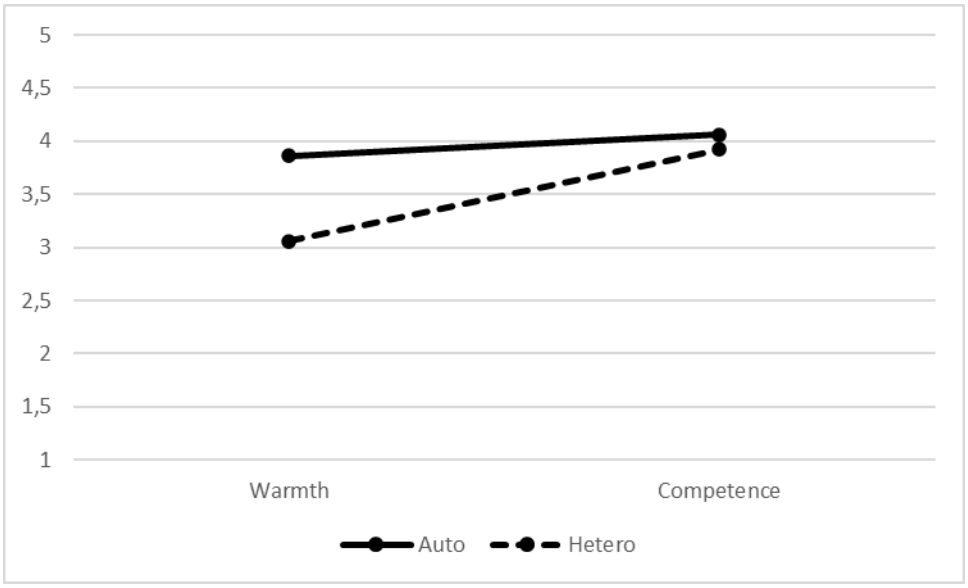


Figure 13.

Estimated marginal means of warmth and competence stereotypes for males with strong ingroup identification, Study 2

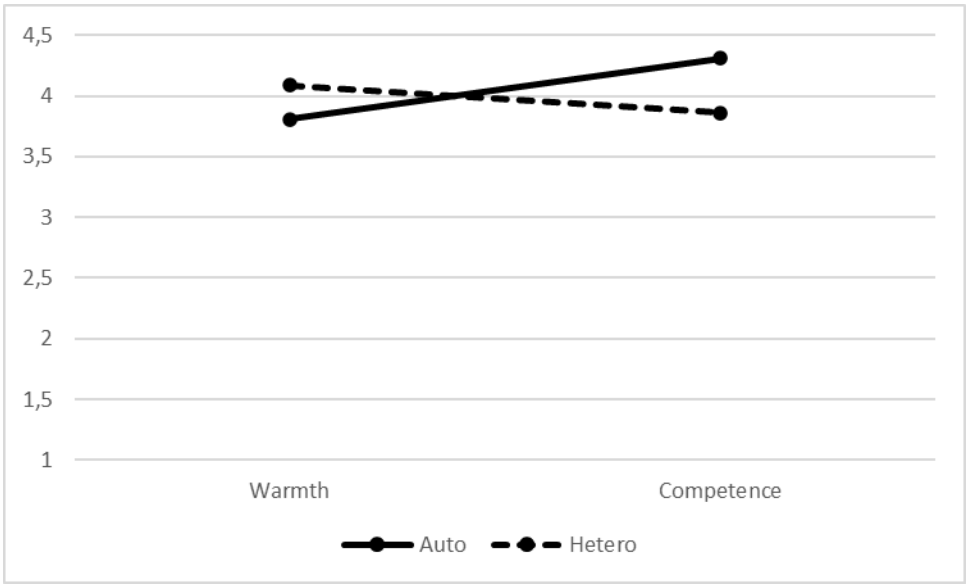
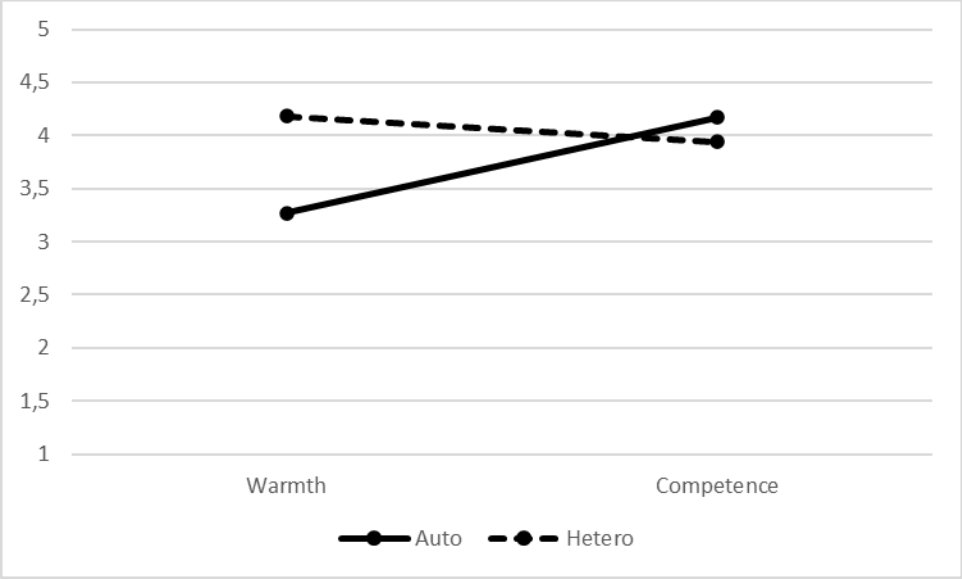


Figure 14.

Estimated marginal means of warmth and competence stereotypes for males with less strong ingroup identification, Study 2



In summary, similar to the findings of Study 1, Hypothesis 2, suggesting a stronger compensation effect with greater identification with gender groups, was not supported. Firstly, as in Study 1, females did not exhibit a compensation effect in their auto- and hetero-stereotypes. Secondly, and contrary to the findings in Study 1, males did not exhibit a compensation effect when considering identification with their gender group. This was evident as they perceived their group as warm as females and significantly more competent than females, particularly when strongly identifying with their male gender group.

Similar to Study 1, no significant effects were observed regarding gender ingroup identification and meta-stereotypes. For instance, irrespective of whether female participants strongly or less strongly identified with their gender group, they consistently reported that males

perceive females as significantly warmer (M = 4.05, SE = 0.08 and M = 3.99, SE = 0.11, respectively) than competent (M = 3.80, SE = 0.08 and M = 3.56, SE = 0.12, respectively) (p_s < .01). Similarly, the meta-stereotypes held by males remained unaffected by their identification with their gender group. Regardless of how strongly they identified with their gender group, males reported to be perceived by females as more competent (M = 3.98, SE = 0.14 and M = 4.13, SE = 0.13, respectively) than warm (M = 3.21, SE = 0.14 and M = 3.75, SE = 0.12, respectively) (p < .001 and p = .003, respectively).

To investigate Hypotheses 3a and 3b, which examined the role of outgroup competitiveness in predicting outgroup warmth (i.e., hetero-stereotypes) and outgroup status in predicting outgroup competence (i.e., hetero-stereotypes), a MANOVA was employed. Dependent variables included warmth and competence hetero-stereotypes, while predictors consisted of competitiveness and status. As both competitiveness and status were measured on continuous scales, two-group (low versus high) variables were generated for both outgroup competitiveness and status using the median split (Med(X_s)) = 3.67 and 4.00, respectively.

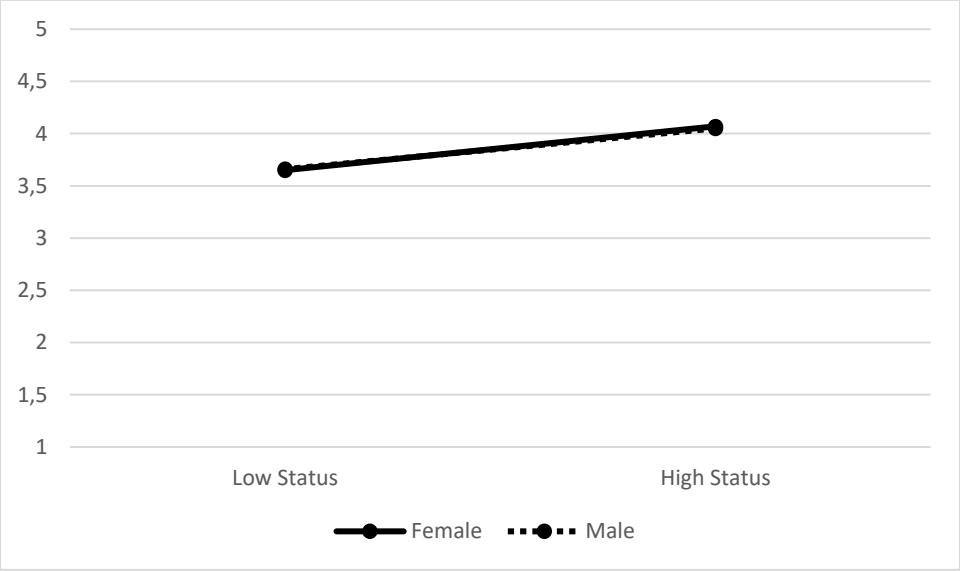
The analyses of between-subjects effects yield a significant main effect of status on warmth and competence hetero-stereotypes, F(1, 155) = 3.95, p = .05, and F(1, 155) = 13.61, p < 001, respectively. However, no significant main effect of competition was observed for warmth and competence hetero-stereotypes, F(1, 155) = 1.67, p = .20, and F(1, 155) = 0.09, p = .77, respectively. Furthermore, no significant two-way interaction was found for status and competition on the warmth and competence hetero-stereotypes, F(1, 155) = 0.09, p = .77, and F(1, 155) = 0.92, p = .34, respectively. Similarly, there was no significant two-way interaction for status and gender groups on warmth and competence hetero-stereotypes, F(1, 155) = 1.63, p = .20, and F(1, 155) = 0.02, p = .88, respectively. Additionally, no significant two-way

interaction of competition and gender groups on warmth and competence hetero-stereotypes were observed, $F(1, 155) = 0.23$, $p = .63$, and $F(1, 155) = 0.82$, $p = .37$, respectively. Moreover, there was no significant three-way interaction between status, competition and gender groups affecting warmth and competence hetero-stereotypes, $F(1, 155) = 0.01$, $p = 0.92$, and $F(1, 155) = 0.67$, $p = .42$, respectively.

Pairwise comparisons for the main effect of status on competence hetero-stereotypes revealed that the outgroup is stereotyped (i.e., hetero-stereotypes) as significantly more competent when perceived as high status ($M = 4.0$, $SE = 0.07$) than low status ($M = 3.66$, $SE = 0.08$), $p < .001$. The absence of an interaction effect of gender groups and status on the hetero-stereotypes suggests no significant differences between females and males. Both groups hetero-stereotyped the outgroup as significantly more competent when the outgroup is perceived high status ($M = 4.07$, $SE = 0.07$ and $M = 4.05$, $SE = 0.13$, respectively) than low status ($M = 3.65$, $SE = 0.11$ and $M = 3.66$, $SE = 0.12$, respectively), ($p = .002$ and $p = .028$, respectively) (see Figure 15).

Figure 15.

Estimated marginal means of competence hetero-stereotypes for females and males, Study 2



In summary, the findings indicate that, Hypothesis 3a, which posited that perceptions of outgroup warmth (i.e., hetero-stereotypes) would be influenced by perceptions of outgroup competitiveness, was not supported. On the other hand, Hypothesis 3b received empirical support, as both females and males tended to hetero-stereotype the outgroup as more competent when perceived as high status and less competent when viewed as low in status.

Discussion

The aim of Study 2 was to replicate and validate the findings and trends observed in Study 1. Specifically, Study 2 aimed to investigate the presence of a compensation effect in our sample (Hypothesis 1) and to examine whether ingroup identification enhances this compensation effect (Hypothesis 2). Since this research study is conceptualised from an intergroup perspective, Study 2 also sought to explore the impact of interdependency (i.e., competition) and relative position (i.e., status) on hetero-stereotypes, in line with the prediction

of the stereotype content model (Fiske et al., 2002). Thus, Study 2 delved into whether females and males are inclined to hetero-stereotype the opposite gender as warmer when perceived as less competitive (high interdependency), while at the same time, being more likely to hetero-stereotype them as less warm when perceiving them as more competitive (low interdependency) (Hypothesis 3a). Additionally, the study aimed to investigate whether females and males tend to hetero-stereotype the opposite gender group as more competent when perceived as having high status and less competent when perceived as having low status (Hypothesis 3b).

The results concerning gender stereotypes of Study 2 were consistent with Study 1 because they revealed that males show a compensation effect in gender stereotypes. Consistent with Study 1, results of Study 2 also revealed that females do not share the compensation effect as they showed ingroup favouritism by perceiving themselves (i.e. auto-stereotypes), relative to males (i.e. hetero-stereotypes), as warmer and more competent. The ingroup favouritism occurred despite them reporting that they are perceived by men as relatively warmer but relatively less competent (i.e., meta-stereotype) and thus, acknowledging the compensation effect shared by male participants. Like in Study 1, the ingroup favouritism shown by females in Study 2 was positively influenced by their ingroup identification in that the stronger females identified with their gender group the more they perceived their group (i.e. auto-stereotypes) as competent compared to how competent they perceived males to be (i.e. hetero-stereotypes). In contrast to Study 1, results for males in Study 2 did not show consistency with the compensation effect when considering the identification with their gender group because stronger identification with their male gender group was related to perceiving their own group as equally warm as and more competent than females, whilst identifying less strongly with their gender group was related to perceiving their group as less warm compared to females and equally competent as females.

Therefore, this does not show a compensation effect as the two dimensions of warmth and competence as not constructed inversely when stereotyping their male group and females.

The results of Study 2 also underscored that the perceived status of the outgroup significantly influences how competent the gender outgroup is perceived (i.e., hetero-stereotypes) for both females and males. In essence, when the opposite gender group is perceived as high in status, they are more likely to be perceived as competent, while they are perceived as less competent when seen as low in status. This alignment with the stereotype content model and existing research reinforces the notion that the competence stereotypes are closely linked to the perceived status of the group under consideration (Durante et al., 2017; Erhart & Hall, 2019; Fiske et al., 2002; Grigoryev et al., 2019). Contrastingly, the results regarding interdependency were inconsistent with the assumptions of the stereotype content model (Fiske et al., 2002) and previous research (Durante et al., 2017; Erhart & Hall, 2019; Grigoryev et al., 2019), which suggested that perceived interdependency would predict warmth hetero-stereotypes. The unique dynamics of the relationship between females and males are posits as a potential explanation for this inconsistency. Frequent interactions through heterosexual relationships, reproduction, and familial, household and other social roles, contribute to increased interdependency and cooperation (Cikara & Fiske, 2009; Ellemers, 2018; Ridgeway, 2001). Consequently, the focus on competition aspects of interdependency in Study 2 might account for the divergent findings.

Study 2 confirms again that the examination of auto-, hetero- and meta-stereotypes provides valuable insight into the dynamics of gender stereotypes and sheds light on the role of gender relations in shaping the stereotypes that different gender groups harbour about each other (i.e. hetero-stereotypes). It is equally crucial to consider these stereotypes within different contexts and comprehend their implications for intergroup emotions and behaviours. In light of

this, a third study was conducted with the dual objectives of re-testing Hypothesis 1 under different contextual conditions and delving into the impact of hetero-stereotypes on intergroup emotions and behaviours (Hypotheses 4a to 4d). This study aimed to extend the understanding of gender stereotypes by exploring how these stereotypes manifest in diverse situations and exploring their consequences for the broader intergroup dynamics.

STUDY 3

Differing from the methodologies employed in the two preceding studies, Study 3 utilised a combination of an experimental and cross-sectional survey design. Beyond the exploration of how individuals from different gender groups perceive themselves in terms of warmth and competency (i.e., auto-stereotype), their perceptions of the outgroup's warmth and competence (i.e., hetero-stereotype), and beliefs about how the outgroup perceives the ingroup (i.e., meta-stereotype), Study 3 sought to investigate the effects of stereotypes on intergroup emotions and intergroup behaviours. Specifically, the study aimed to retest Hypothesis 1, which posited that females would stereotype themselves and be stereotyped by males as warmer than competent when compared to males, while males would stereotype themselves and be stereotyped by females as more competent than warm when compared to females. Additionally, the study aimed to explore the connections between perceiving the opposite gender group as warm and competent and subsequent emotions and behaviours. Hypotheses 4a-d were formulated to predict the relationships between these stereotypes and emotions (admiration, pity, contempt, envy) and subsequent behaviours (facilitating or harming). This multifaceted approach in Study 3 was designed to deepen the understanding of the intricate interplay between gender stereotypes, emotions, and behaviours in intergroup dynamics.

Recognizing the significance of social context in shaping gender stereotypes, particularly the impact of crossed categorisation, Study 3 integrated an experimental element into the research design. This was achieved by controlling for gender context, distinguishing between *dichotomic* and *crossed* categorisation. Participants were randomly assigned to either a dichotomic intergender context, where only gender was emphasised, or a crossed intergender context, where both gender and being a student were simultaneously highlighted. This

experimental manipulation allowed for a nuanced examination of how the interplay of gender and additional social categories influences the formation and dynamics of gender stereotypes.

Participants

A minimum sample size of 248 was required, assuming an alpha level of .05, an effect size f(V) of .25, and a priori statistical power of .95 using 2 x 3 F-statistic (MANOVA repeated measures within and between interactions). A total of 747 participants started the study, with 476 completing it, yielding a completion rate of 63%. Exclusions were made for participants who did not identify themselves as male or female (n = 23) and missing data cases (n = 248). The resulting final sample comprised 121 male and 355 female participants. Participants' ages ranged from 18 to 70 years, with an average age of 30.37 years (SD = 8.28). Consistent with Studies 1 and 2, Study 3 focused exclusively on members of the majority group, specifically Black South Africans.

Procedure

The study began by collecting basic demographic information from participants, including their gender group, age, and ethnicity. The gender groups considered were limited to male and female, excluding transgender males and females. Subsequently, participants were randomly assigned to one of two experimental conditions: *dichotomic* intergender context (n = 246) or *crossed* intergender context (n = 230). This random allocation was done based on participants' self-identified gender group, ensuring that both male and female participants were represented in both conditions, such as male group or male student group for those identifying as male. The purpose of these conditions was to investigate and compare the outcomes between dichotomic and crossed intergender contexts, allowing for the control of social context effects.

Following the allocation, participants responded to inquiries regarding auto-, hetero-, and meta-gender stereotypes, intergender emotions, and intergender behaviour. The order of presentation for the gender stereotype items within each form (auto-, hetero-, meta-stereotypes) was randomized. However, the sequence of measures—beginning with auto-stereotypes, followed by hetero-stereotypes, and concluding with meta-stereotypes—remained the same as in the previous studies. Subsequently, participants provided responses to questions related to intergender emotions and intergender behaviour. The items within these measures were presented randomly, but the overall order of assessing intergender emotions preceding intergender behaviour was maintained.

Measurements

Gender stereotypes were assessed as in the previous studies. The warmth/communality dimension and the competency/agency dimension of the auto-stereotype measure showed acceptable to excellent reliabilities within each of the four conditions: female students (α =.80 and α =.67, respectively), females (α = .76 and α = .72, respectively), male students (α = .84 and α = .73, respectively) and males (α = .78 and α = .74, respectively). Likewise, the *hetero-stereotype* assessment of the warmth dimension and the competency dimension showed good to excellent reliabilities within each of the four conditions: female students (α = .88 and α = .81, respectively), females (α = .87 and α = .79, respectively), male students (α = .84 and α = .80, respectively) and males (α = .73 and α = .73, respectively). Equally good to excellent reliabilities were found for the meta-stereotype measure of the warmth dimension and the competency dimension within each of the four conditions: female students (α = .86 and α = .85, respectively), females (α = .85 and α = .85, respectively), male students (α = .89 and α = .82, respectively) and males (α = .87 and α = .83, respectively).

An exploratory factor analysis for the agency/competence and communality/warmth dimensions was done to control for the parallels between agency and competence, and communality and warmth. According to the eigenvalues, the communality/warmth items showed one factor for all the stereotypes, with three exceptions (see Table S3 in the Supplementary). The agency/competence items produced one or two factors, as per eigenvalues (see Table S3 in the Supplementary), however, there were no clear identifiable patterns, and the factors were never aligned with the theoretically assumed distinctions between agency and competence.

Intergender emotions involved the four emotions discussed by Fiske and colleagues (2002) and were measured using eight items that measured contempt, disgust, admiration, pride, pity, sympathy, envy, and jealousy. Each of the four intergender emotions (i.e. admiration, contempt, envy and pity) were measured using two of the eight items. However, due to inconsistencies in the correlations of the items measuring each emotion within the different gender groups and contexts we decided to only keep the four individual items that measured admiration, contempt, envy and pity. Participants were asked to indicate the extent to which the ingroup tends to feel each emotion towards the outgroup. More specifically, the following instruction was used: "To what extent do female students [male students/females/males] tend to feel admiration [contempt, envy, pity] toward male students [female students/males/females]?" Participants were requested to indicate their answers on a 5-point answer format ranging from 1 (*not at all*) to 5 (*extremely*).

Intergender behaviour was measured as facilitative and harming behaviours, which were summarised from Cuddy and colleagues' (2007) BIAS Map. Four items were used to measure each of the facilitative (e.g., help, protect, cooperate, associate) and harming (e.g., fight, attack, exclude, demean) behaviours. Participants were asked to indicate the extent to which the ingroup

tends to perform each behaviour towards the outgroup. For instance, the question was phrased in the following way: "Do female students [male students/females/males] tend to help [protect, associate, attack, exclude etc.] male students [female students/females/males]. The answer format ranged from 1 (*not at all*) to 5 (*extremely*). Acceptable to good reliabilities were found for both facilitation and harm within each of the four conditions: female students (α = .70 and α = .74, respectively), females (α = .70 and α = .73, respectively), male students (α = .73 and α = .80, respectively) and males (α = .77 and α = .80, respectively).

Results

Preliminary analysis

To begin our analysis, we conducted a descriptive summary of the data, focusing on stereotypes, emotions, and behaviour, differentiating between gender and social context groups. The relevant statistics are presented in Tables 4 and 5. Table 4 specifically outlines the means, standard deviations, and intercorrelations of the stereotype measures within the dichotomic and crossed intergender contexts.

The findings presented in Table 4 align with those of Studies 1 and 2, indicating that the warmth and competence dimensions were significantly and positively correlated ($p_s < .01$) across auto-, hetero-, and meta-stereotypes in both female and male participants. This consistency in correlations suggests a robust pattern across studies in the relationships between these dimensions within the various forms of gender stereotypes.

Table 4.

Means, standard deviations and intercorrelations for female and male stereotypes of female and male participants in the dichotomic and crossed contexts, Study 3

		1	2	3	4	5	6
Intergroup Context: dichotomic							
Females	Mean	4.26	**4.15**	3.83	**3.01**	**3.73**	**4.00**
	SD	0.49	0.57	0.66	0.81	0.77	0.74
Males	Mean	4.15	**3.46**	3.88	**4.12**	**3.97**	**3.20**
	SD	0.51	0.59	0.54	0.54	0.63	0.83
Intergroup Context: crossed							
Females	Mean	**4.31**	**3.98**	3.99	**3.74**	3.94	**3.91**
	SD	0.42	0.61	0.62	0.77	0.71	0.73
Males	Mean	**4.11**	**3.63**	3.98	**4.04**	3.86	**3.49**
	SD	0.51	0.67	0.60	0.66	0.64	0.77
1. Auto-stereotype Competence		-	**.44***/.43*****	.24*/.18	.32**/.13	.63***/.57***	.13/.31*
2. Auto-stereotype Warmth		**.55***/.48*****	-	.38***/.07	.07/-.07	.33**/.33**	.51***/.42***
3. Hetero-stereotype Competence		.16*/.26***	.25***/.33***	-	**.41***/.59*****	.09/.16	.28*/.14
4. Hetero-stereotype Warmth		.20**/.22***	.13*/.09	**.51***/.39*****	-	.39**/.10	-.07/.01
5. Meta-stereotype Competence		.44***/.44***	.36***/.30***	.05/.16*	.30***/.32***	-	**.36**/.66****
6. Meta-stereotype Warmth		.36***/.34***	.46***/.60***	.21**/.41**	.13/.11	**.57***/.51*****	-

Note. **p* < .05, ***p* < .01, ****p* < .001. The means of female and male participants in bold differ significantly from each other within the respective context. Correlation coefficients for female dichotomic /female crossed conditions are reported in the lower left part of the table, while the correlation coefficients for the male dichotomic /male crossed condition are reported in the upper right part of the table. Correlation coefficients in bold indicate intercorrelations between warmth and competence within each stereotype form.

Table 5 summarizes the means, standard deviations and intercorrelations across hetero-stereotypes, intergender emotions, and intergender behaviour for females and males. The results reveal that warmth and competence hetero-stereotypes were significantly and positively correlated ($p_s < .001$) for both males and females. Additionally, there were significantly positively correlations between admiration and contempt for both females and males ($p_s < .001$), as well as between pity and envy for both females and males ($p < .01$ and $p < .05$, respectively). Furthermore, significant positive correlations were observed between admiration and pity ($p < .001$), contempt and envy ($p < .001$), and between contempt and pity ($p < .001$) exclusively for females. The results further revealed a significant negative relationship between facilitation and harm among male participants ($p < .001$).

Table 5.

Means, standard deviations and intercorrelations of the principal variables of female and male participants, Study 3

		1	2	3	4	5	6	7	8
Females	Mean	3.90	3.31	3.66	3.11	2.89	3.16	3.53	2.22
	SD	0.64	0.87	1.04	0.98	1.04	1.14	0.74	0.88
Males	Mean	3.96	4.12	3.93	3.02	2.91	3.56	3.85	2.37
	SD	0.55	0.52	1.07	0.85	1.01	1.08	0.73	0.90
	1. Competence	-	.40***	.16	.15	.08	-.04	.19*	-.04
	2. Warmth	.45***	-	.03	.15	.17	.09	.03	.17
	3. Admiration	.12*	.04	-	.26**	.15	.16	.18	.15
	4. Contempt	.02	-.05	.20***	-	.17	.08	-.05	.34***
	5. Envy	.05	-.05	.24***	.23***	-	.20*	-.08	.23*
	6. Pity	.04	.01	.27***	.22***	.15**	-	.15	.10

7. Facilitation	.13*	.15**	.32***	.06	.12*	.31***	-	-.34***
8. Harm	-.04	-.05	.01	.25***	.17**	.05	-.05	-

Note. ***$p < .001$, **$p < .01$, *$p < .05$. The correlation coefficients for the females are reported in the lower part of the table, and the correlation coefficients for the males are reported in the upper part of the table. Competence = Hetero-stereotype Competence, Warmth = Hetero-stereotype Warmth.

Hypotheses Testing

Proceeding with the analytical approach in Study 3, mirroring the methodology of Studies 1 and 2, the investigation encompassed not only auto- and hetero-stereotypes but also delved into meta-stereotypes. Additionally, Study 3 controlled for the gender context, introducing a dichotomic versus crossed variable. Hypotheses were tested through a 2 x 3 repeated measures ANOVA. Here, the within-subject factors included the dimensions of warmth and competence for auto-, hetero-, and meta-stereotypes. Simultaneously, the male and female gender groups and the dichotomic and crossed stereotype conditions constituted the between-subject factors. It is crucial to note that, akin to the preceding studies, Study 3 encountered a violation of the assumption of sphericity, as evidenced by the statistically significant Mauchly's test for the overall sample, $\chi 2(2) = 172.87$, $p < .001$. This violation implies significant differences in variances across levels. Given that the epsilon (ε) values for both Greenhouse-Geisser ($\varepsilon = .780$) and Huynh-Feldt ($\varepsilon = .786$) exceeded .75, the Huynh-Feldt correction was implemented to rectify the degrees of freedom (Field, 2018).

To test Hypothesis 1, which posited that females tend to stereotype themselves and are stereotyped by males as warmer than competent when compared to males, while males tend to stereotype themselves and are stereotyped by females as more competent than warm when

compared to females, the four-way interaction between gender group, conditions (dichotomic and crossed), stereotype dimensions (warmth and competence), and stereotype forms (auto-, hetero-, meta-stereotypes) was analysed. The four-way interaction yielded statistical significance, $F(1.57, 820.81) = 26.45$, $p < .001$, $\eta p^2 = .048$.

Pairwise comparisons elucidated that, in both dichotomic and crossed contexts, aligning with the findings of Studies 1 and 2, females consistently auto-stereotyped their group as significantly warmer and more competent than they perceived males to be (i.e., hetero-stereotypes), $p_s < .001$ (see Figure 16 and 17). Conversely, and consistent with the outcomes of previous studies, males, in both dichotomic and crossed contexts, auto-stereotyped their gender group as less warm compared to how they perceived females to be (i.e., hetero-stereotypes), $p_s < .001$ (see Figure 18 and 19). Notably, the competence stereotypes held by males exhibited a contextual difference. In the dichotomic context, males auto-stereotyped their group as significantly more competent than they perceived females to be, replicating the compensation effect found in Studies 1 and 2, $p = .001$ (see Figure 18). In contrast, in the crossed context, no significant difference was observed in how males auto-stereotyped their group's competence compared to how they perceived females to be, $p = .579$ (see Figure 19).

In summary, akin to the patterns identified in Studies 1 and 2, these results suggest that females consistently exhibit univalent stereotypes characterised by ingroup favouritism, irrespective of the social context. Meanwhile, males, particularly in the dichotomic context, manifest ambivalent stereotypes indicative of a compensation effect. In addition, examining the meta-stereotypes in both the dichotomic and crossed contexts revealed intriguing patterns. Similar to the findings in Studies 1 and 2, females in the dichotomic context reported that males perceive their group as significantly warmer than competent, with warmth ($M = 4.00$, $SE = 0.05$)

being rated higher than competence (M = 3.73, SE = 0.05), p < .001 (see Figure 20). However, in contrast to the previous studies, females in the crossed context reported no significant difference in how males perceive them in terms of warmth (M = 3.92, SE = 0.05) and competence (M = 3.94, SE = 0.05), p = .581 (see Figure 21).

Consistent with the findings of Studies 1 and 2, males in both the dichotomic and crossed contexts reported that females perceive them as significantly more competent than warm, with competence (M = 3.97, SE = 0.09 and M = 3.86, SE = 0.09, respectively) being rated higher than warmth (M = 3.20, SE = 0.09 and M = 3.49, SE = 0.09, respectively), p_s < .001 (see Figure 20 and 21). These results indicate that, akin to the patterns identified in Studies 1 and 2, the meta-stereotypes held by males suggest that they perceive the compensation effect as compatible.

Figure 16.

Estimated marginal means of warmth and competence stereotypes for females, Study 3

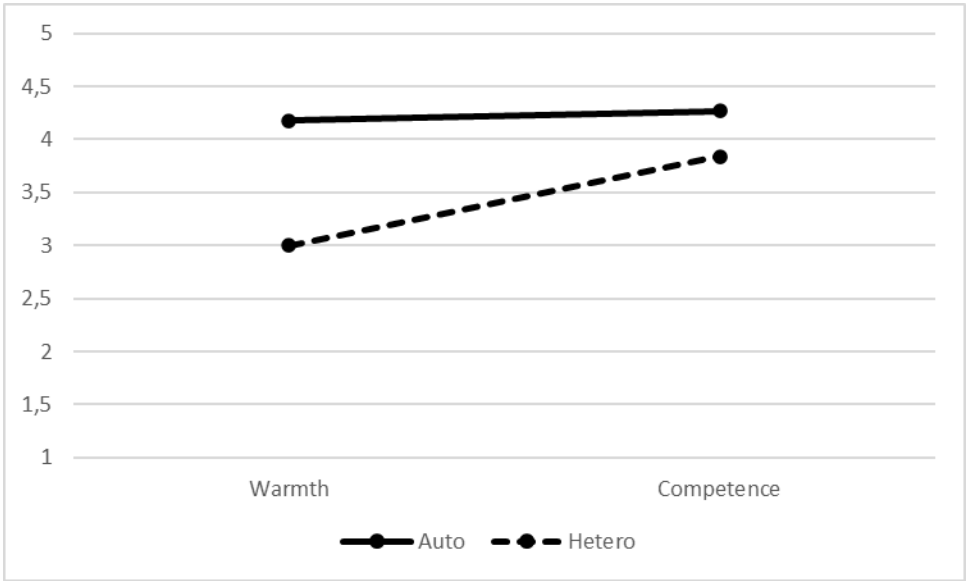


Figure 17.

Estimated marginal means of warmth and competence stereotypes for female students, Study 3

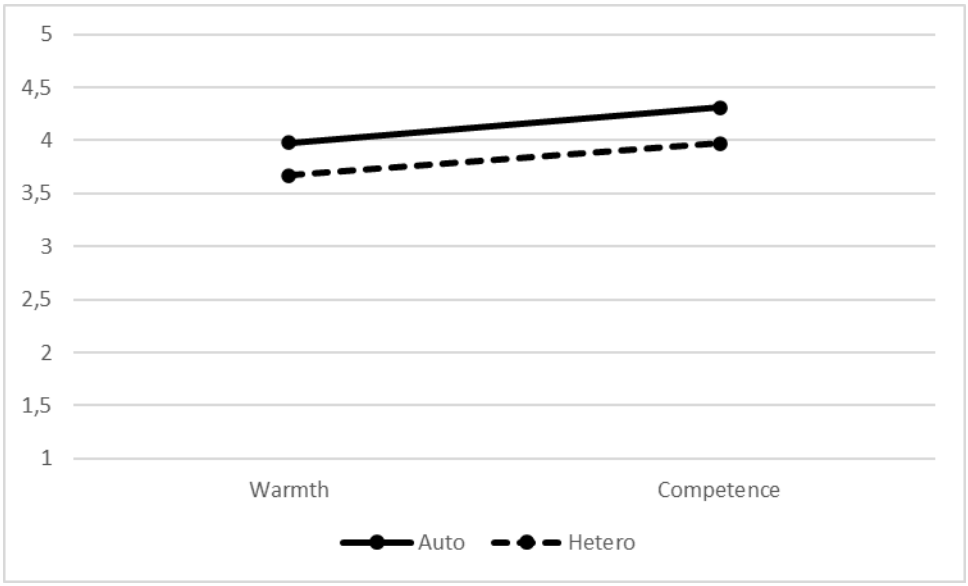


Figure 18.

Estimated marginal means of warmth and competence stereotypes for males, Study 3

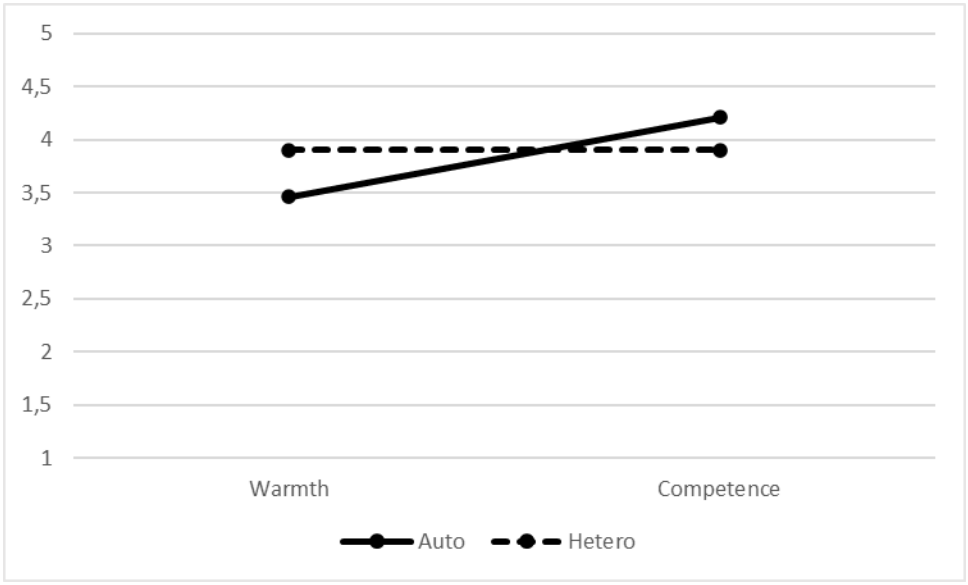


Figure 19.

Estimated marginal means of warmth and competence stereotypes for male students, Study 3

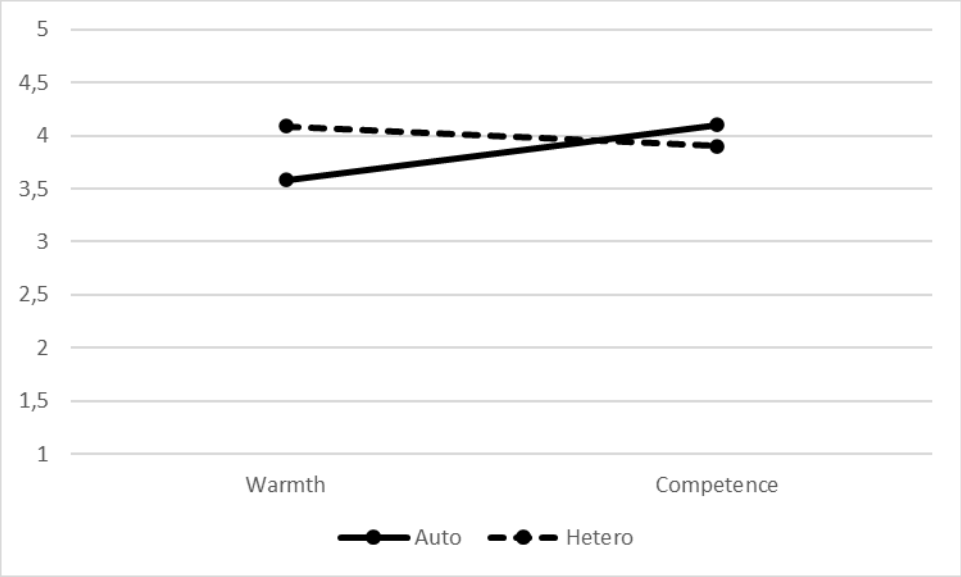


Figure 20.

Estimated marginal means of meta-stereotypes for females and males, Study 3

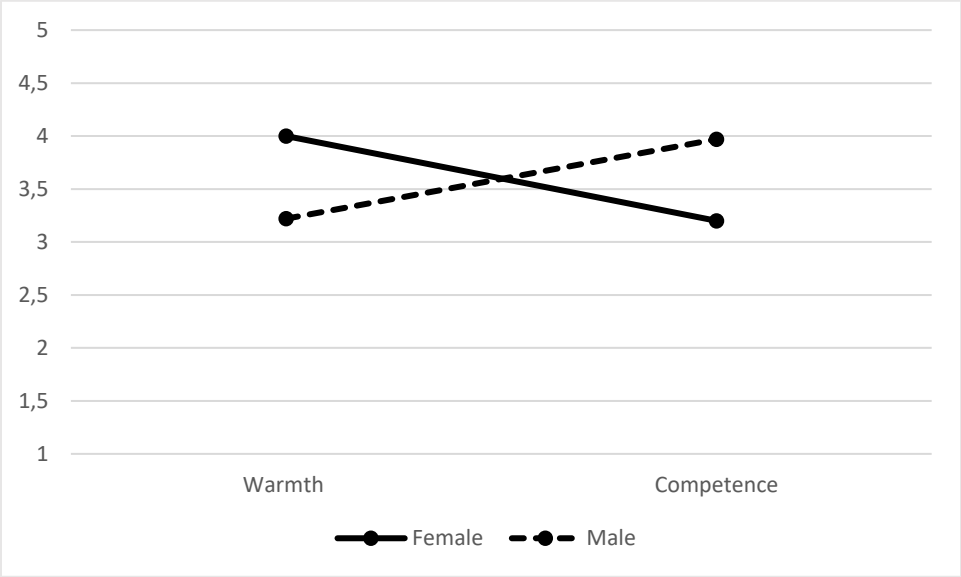
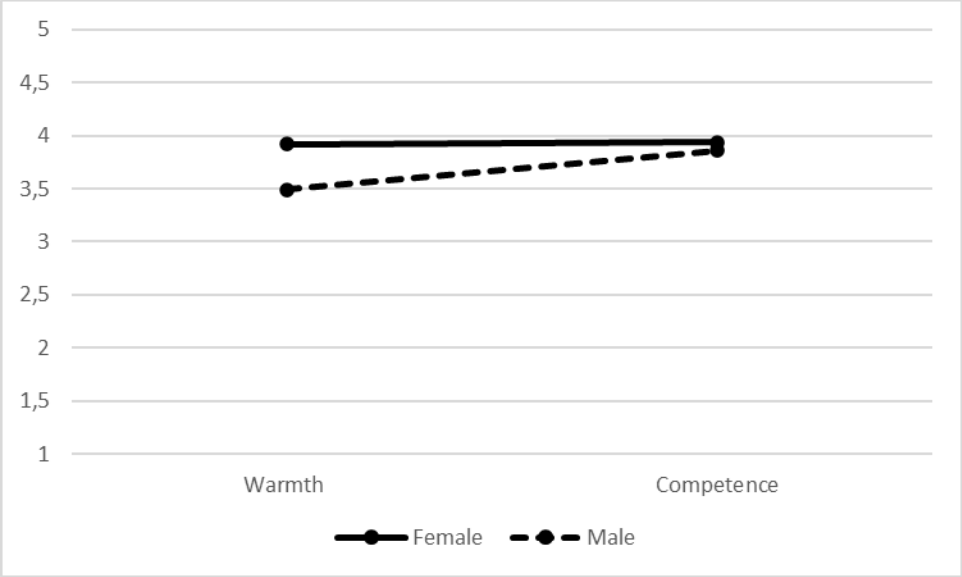


Figure 21.

Estimated marginal means of meta-stereotypes for female and male students, Study 3

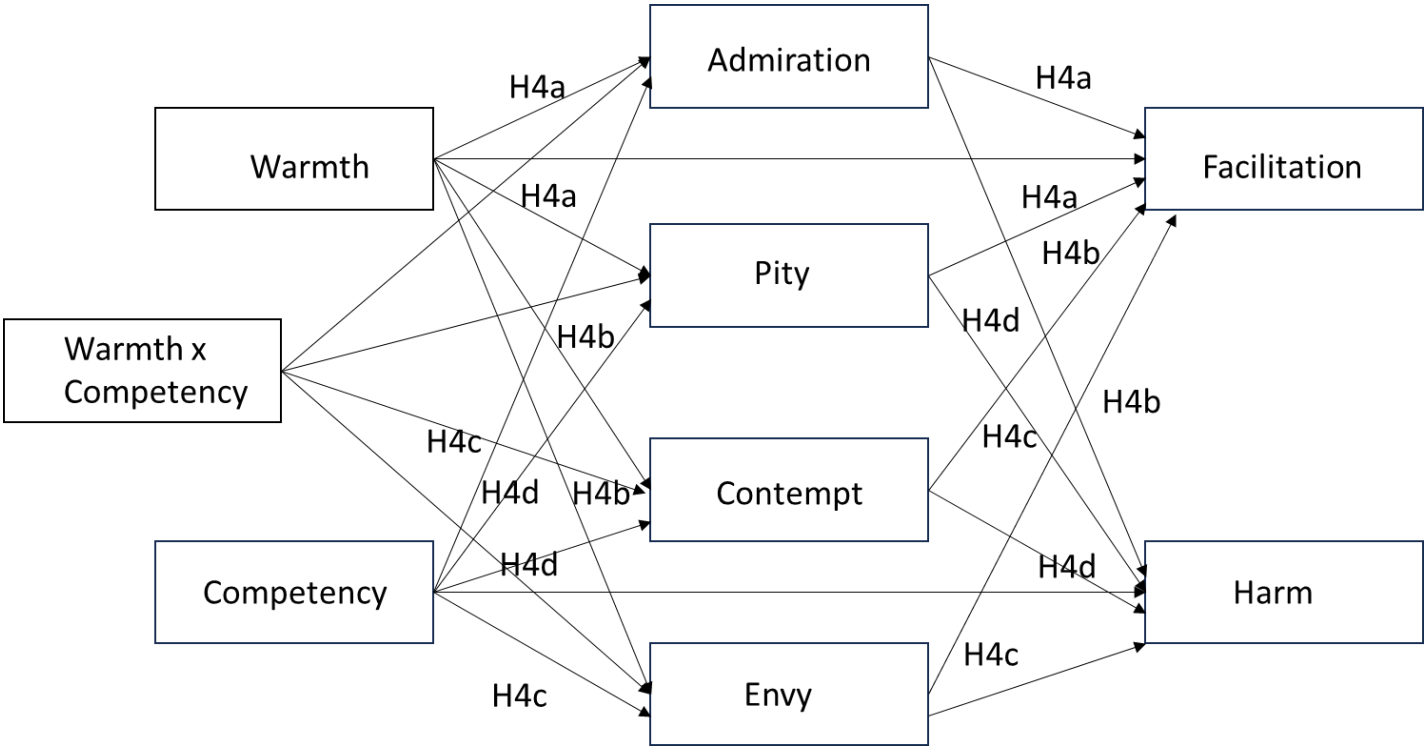


In summary, the outcomes of Study 3 reinforce the presence of the compensation effect in gender stereotypes, particularly evident in males within a dichotomic context. In this context, males auto-stereotype their group as less warm but more competent than how they perceive females. However, this compensation effect is not replicated in the crossed context, where males still auto-stereotype their group as less warm than females, but then perceive that there is no different between how competent their male group and females are. On the other hand, females consistently display ingroup favouritism, projecting higher warmth and competence onto their own group and lower scores on both dimensions for males, irrespective of the context. Moreover, the meta-stereotypes held by females in the crossed context align with how males perceive them, suggesting that females' perceptions of how they are viewed by males match the hetero-stereotypes held by males.

Hypotheses 4a to 4d, which posited that perceiving the opposite gender group as warm will predict admiration and pity which will increase facilitative behaviour (Hypothesis 4a), that perceiving the opposite gender group as less warm will predict contempt and envy which will increase harming behaviour (Hypothesis 4b), that perceiving the opposite gender group as competent will predict admiration and envy which will increase facilitating behaviour (Hypothesis 4c), and that perceiving the opposite gender group as less competent will predict contempt and pity which will increase harming behaviour (Hypothesis 4d), were tested through path analysis using AMOS 28. The model included direct paths from warmth and competence hetero-stereotypes and the interaction between warmth and competence hetero-stereotypes on emotions and from warmth and competency hetero-stereotypes, the interaction between warmth and competency hetero-stereotypes, and emotions on facilitation and harm, and the indirect paths from warmth and competence hetero-stereotypes on facilitation and harm through emotions (see Figure 22). For all parameter estimates we applied bootstrapping with 2000 iterations calculating 95% percentile confidence intervals.

Figure 22.

Conceptual Module, Study 3



In the first step, we examined the gender group dependency of the relationships between the theoretical constructs by comparing the data of female and male participants through model specification (see Table 6). We first compared the totally unconstrained model (Model 1) that allowed gender group differences in all estimated parameters, with the structural weight model (Model 2) that assumed measurement weights to be equal between the gender groups. The results of the model comparison as depicted in Table 6 (see under Model comparisons Δ Chi-Square) showed that the more parsimonious Model 2 fitted equally well the data as the less parsimonious Model 1, $\Delta\chi^2$ (26) = 29.347, $p > .05$. Secondly, we compared structural weight model (Model 2) with the more parsimonious structural intercept model, which assumes measurement weights and intercepts to be equal between gender groups (Model 3), and with the structural residual model,

which assumes measurement weights, intercepts, and residuals to be equal between gender groups (Model 4). The results of the model comparisons revealed that Models 3 and 4 fitted the data worse than Model 2.

Table 6.

Model comparisons, Study 3

	Model 1 Totally unconstrained model	Model 2 Structural weight model	Model 3 Structural intercept model	Model 4 Structural residuals model
Number of Parameter estimates	99	73	64	53
Chi-Square	39.3582	68.929	236.132	302.359
Chi-Square/DF	4.398	1.969	5.367	5.497
NFI	.942	.900	.656	.559
(parsimony adjusted)	.118	.437	.401	.427
CFI	.950	.945	.687	.597
(parsimony adjusted)	.119	.459	.420	.456
RMSEA	.076	.041	.089	.088
Model comparisons Δ Chi-Square				
Model 2	(26) = 29.347	-		
Model 3	(35) = 196.549***	(9) = 167.203***	-	
Model 4	(46) = 262.777***	(20) = 233.431***	(11) = 66.228***	-

Note. Model 1 allowed between-group differences in all estimated parameters (Totally unconstrained model). Model 2 constrained measurement weights (Structural weight model). Model 3 constrained measurement weights and intercepts. Model 4 constrained all estimated parameters (Totally constrained model). ***$p < .001$, **$p < .01$, * $p < .05$.

Table 7 reports the direct and indirect effects between warmth and competence hetero-stereotypes, emotions and facilitation and harm for Model 2. The results suggest that the emotional responses (contempt, admiration, envy) are directly linked to competence perceptions

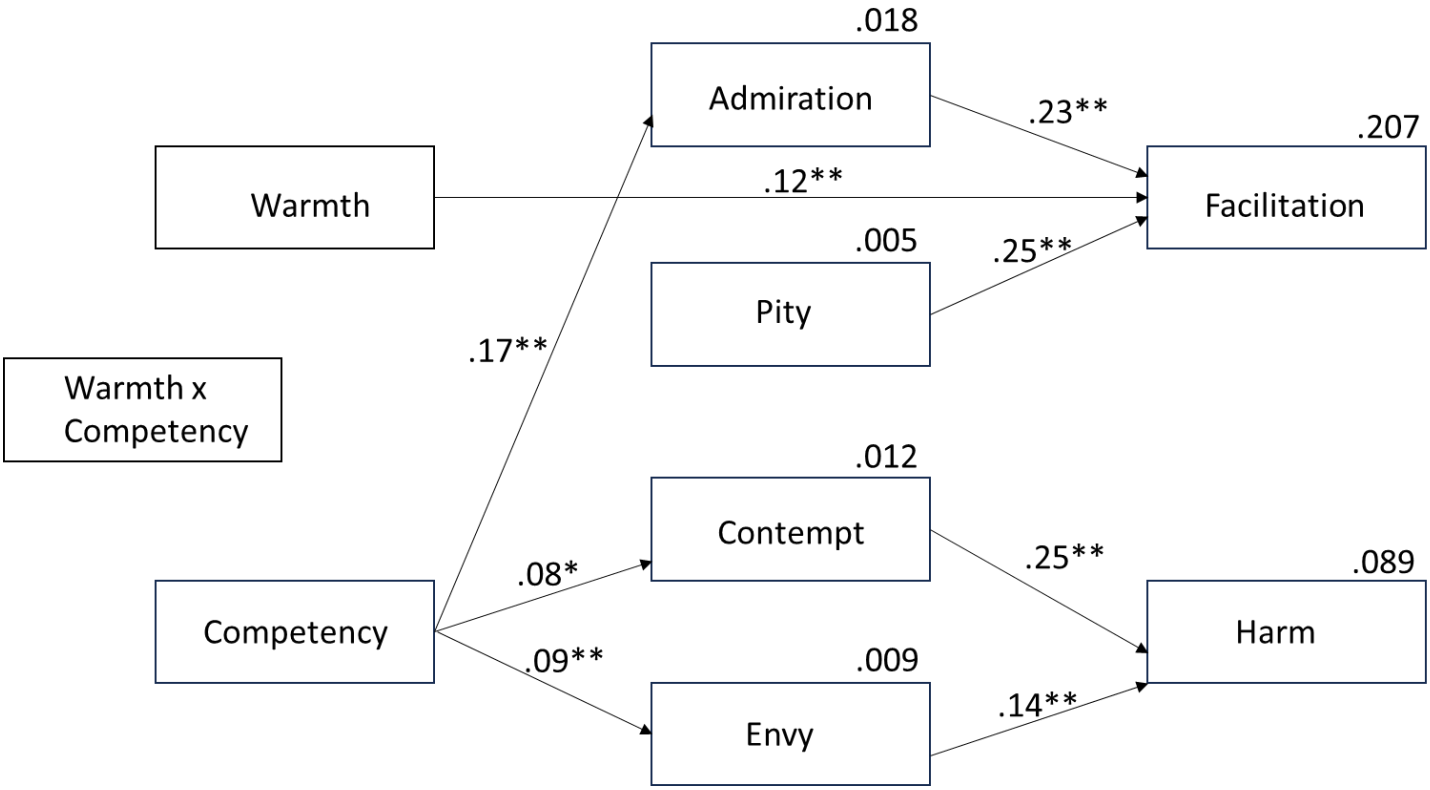
of the opposite gender group, while the behavioural response of facilitation is directly linked to warmth perceptions of the opposite gender group. It is interesting that there are no direct links from perceptions of competence to behavioural responses or from perceptions of warmth to emotional responses.

To test the Hypotheses 4a to 4d, we will examine the indirect effects of Model 2. Hypothesis 4a, which posited that perceiving the opposite gender group as warm will predict admiration and pity which will increase facilitative behaviour, was not supported because the indirect effects between warmth hetero-stereotype and facilitation through admiration or pity were not statistically significant. Hypothesis 4b, which posited that perceiving the opposite gender group as less warm will predict contempt and envy which will increase harming behaviour, was also not supported either. Specifically, no indirect effects between warmth hetero-stereotype and harm though contempt and envy reached statistical significance. Hypothesis 4c, which stated that perceiving the opposite gender group as competent will predict admiration and envy which will increase facilitating behaviour, was supported. Specifically, the indirect effect between competence hetero-stereotype and the behavioural response of facilitation through the feeling of admiration reached statistical significance (see Table 6). However, the latter was not found for the indirect effect between competence hetero-stereotype and the behavioural response of facilitation through the feeling of envy. Lastly, Hypothesis 4d, which posited that perceiving the opposite gender group as less competent will predict contempt and pity which will increase harming behaviour, was not supported. Instead, two statistically significant positive indirect effects were found between competence hetero-stereotype and the behavioural response of harm through either the feeling of contempt or the feeling of envy (see Table 6). The interaction term between perceived warmth and competence (i.e. high warmth –

high competence, high warmth – low competence, low warmth – high competence, low warmth – low competence), had no direct or indirect effects (see Figure 23).

Figure 23

Statistically direct and indirect effects, Study 3



In summary, the results of Study 3 provide evidence that hetero-stereotypes indeed influence individuals' emotions and behaviours. For instance, perceiving the opposite gender group as competent might result in facilitating behaviour when the perceived competence is emotionally appraised with admiration. However, perceiving the opposite gender group as competent can also result in harming behaviour when the perceived competence is emotionally appraised with contempt, or envy. While the effects of competence hetero-stereotype on

behavioural responses (e.g., facilitation or harm) are all mediated through emotion, warmth hetero-stereotype was directly related to facilitation in the present study.

Table 7.

Tests of direct and indirect path for Model 2(assuming no group differences in paths between females and males), Study 3

	Path	*Coeff.*	*SE*	*95%CL*	*p*
Direct Effects	C → Contempt	.08	.05	[.001;.175]	.046
	C → Admiration	.17	.05	[.065;.264]	.002
	C → Pity	.03	.05	[-.074;.127]	.585
	C → Envy	.09	.05	[.000;.188]	.051
	W → Contempt	-.01	.05	[-.074;.127]	.866
	W → Admiration	.03	.05	[-.078;.121]	.642
	W → Pity	.04	.05	[-.061;.147]	.417
	W → Envy	-.04	.05	[-.142;.060]	.442
	C*W → Contempt	.08	.05	[-.019; .189]	.117
	C*W → Admiration	.06	.06	[-.055; .182]	.333
	C*W → Pity	.04	.06	[-.074; .182]	.506
	C*W → Envy	.05	.06	[-.059; .160]	.401
	C → Facilitation	.09	.05	[-.003; .186]	.054
	C → Harm	-.06	.05	[-.164; .038]	.219
	W → Facilitation	.12	.05	[.021; .203]	.017
	W → Harm	.02	.05	[-.079; .123]	.635
	C*W → Facilitation	.08	.06	[-.038; .207]	.182
	C*W → Harm	-.06	.05	[-.166; .041]	.245
	Contempt → Facilitation	-0.4	.04	[-.125; .045]	.379
	Admiration → Facilitation	.23	.05	[.145; .321]	.001
	Pity → Facilitation	.25	.04	[.157; .328]	.001
	Envy → Facilitation	.00	.04	[-.081; .090]	.960
	Contempt → Harm	.25	.05	[.151; .343]	.001
	Admiration → Harm	-.03	.04	[-.107; .064]	.646
	Pity → Harm	.02	.05	[-.080; .108]	.725
	Envy → Harm	.14	.04	[.058; .229]	.002
Indirect Effects	C → Contempt → Facilitation	-.00	.01	[-.020; .002]	.189
	C → Admiration → Facilitation	.05	.02	[.019; .084]	.002
	C → Pity → Facilitation	.01	.02	[-.022; .037]	.556
	C → Envy → Facilitation	.00	.01	[-.010; .012]	.953
	W → Contempt → Facilitation	.00	.00	[-.004; .007]	.644
	W → Admiration → Facilitation	.01	.01	[-.016; .028]	.621

W → Pity → Facilitation	.01	.01	[-.012; .036]	.391
W → Envy → Facilitation	.00	.00	[-.006; .006]	.938
C*W → Contempt → Facilitation	-.00	.00	[-.016; .002]	.254
C*W → Admiration → Facilitation	.01	.02	[-.012; .044]	.297
C*W → Pity → Facilitation	.01	.02	[-.017; .044]	.476
C*W → Envy → Facilitation	.00	.00	[-.007; .006]	.986
C → Contempt → Harm	.03	.02	[.003; .076]	.030
C → Admiration → Harm	-.01	.01	[-.031; .014]	.495
C → Pity → Harm	.00	.01	[-.005; .015]	.531
C → Envy → Harm	.02	.01	[.002; .051]	.032
W → Contempt → Harm	-.00	.01	[-.031; .026]	.856
W → Admiration → Harm	-.00	.00	[-.010; .003]	.498
W → Pity → Harm	.00	.00	[-.004; .014]	.470
W → Envy → Harm	-.01	.01	[-.026; .009]	.375
C*W → Contempt → Harm	.02	.02	[-.005; .060]	.096
C*W → Admiration → Harm	-.00	.01	[-.018; .004]	.398
C*W → Pity → Harm	.00	.00	[-.004; .015]	.480
C*W → Envy → Harm	.01	.01	[-.011; .032]	.357

Note. C = Hetero-stereotype Competence, W = Hetero-stereotype Warmth, C*W = Interaction Term between Hetero-stereotype Competence and Hetero-stereotype Warmth. The information showed in grey indicate statistically significant effects.

Note. ***$p < .001$, **$p < .01$, *$p < .05$

Discussion

The aim of Study 3 was to retest and validate the results of Study 1 and 2. More specifically, the aim of Study 3 was to ascertain the presence of a compensation effect (Hypothesis 1) in dichotomic and crossed intergender contexts. Furthermore, the study aimed to explore the interrelations between warmth and competence hetero-stereotypes and subsequent emotions and behaviours.

The results of Study 3 were similar to the findings of Study 1 and 2 as they showed that the compensation effect was only present in males. However, the compensation effect was only found in the dichotomic intergender context and not in the crossed intergender context, suggesting that intergroup context plays a role in the presence or lack thereof of the compensation effect in gender auto- and hetero-stereotypes held by males. Likewise, the crossed intergender context showed a difference in the meta-stereotypes of females as they perceived that there is no difference between how warm and competent males perceived them to be, whilst stereotyping that they are perceived as warmer than competent in the dichotomic intergender context. This suggests that in a context where females and males share a social category, females tend to think that males perceive them as similar in warmth and competent. The results of Study 3 were also consistent with Study 1 and 2 for females with regards to their gender stereotypes because females do not show a compensation effect, but rather ingroup favouritism, and this is regardless of the intergender context.

The results of Study 3 also implied that although gender differences exist in how they auto-, hetero, and meta-stereotype, gender differences did not reveal in the effects of hetero-stereotypes on behavioural responses mediated through emotions. More specifically, the path analysis revealed that perceiving the other gender group as warm elicits facilitating behaviour

towards them without being mediated by emotions, which is contrary to what was hypothesised (i.e. Hypotheses 4a and 4b) and the predictions of the BIAS map (Cuddy et al., 2007). Since warmth perceptions involve whether the outgroup members are perceived as having good or bad intentions (Cuddy et al., 2008; Fiske et al., 2002), this suggests that when the gender outgroup is perceived as having good intentions and therefore does not present a threat (i.e. are warm), it makes facilitative behaviour in our sample more likely, which can lead to good intergender relations. However, when the outgroup is perceived to be high on competence, which is the outgroup's ability to execute their intentions (Cuddy et al., 2008; Fiske et al., 2002), facilitative behaviour towards the outgroup is likely if feelings of admiration are evoked, whereas harming behaviour will be the most likely response if feelings of contempt or envy are evoked. The former is partially in line with the predictions of the BIAS map (Cuddy et al., 2008) and previous research (García-Ael et al., 2018; Vaughn et al., 2017) which found that high competence perceptions predict facilitative behaviour through feelings of admiration (Constantin & Cuadrado, 2019). However, the latter is not in line with the predictions of the BIAS map (Cuddy et al., 2008) and previous research (Boysen et al., 2023) that found that it is the perceived lack of competence that predicts harming behaviour when feelings of contempt are evoked. The latter, also contradicts the predictions by the BIAS map (Cuddy et al., 2008) that state that perceived competence will predict facilitation when feelings of envy are evoked.

General Discussion

The overall aim of this research was to understand intergender stereotypes of the majority group (black South Africans) in South Africa from an intergroup perspective. The aim was four-fold whereby the role of gender identification (Study 1 and 2), intergender relations (i.e. perceived interdependency and status; Study 2), and social context (Study 3) on intergender stereotypes (Studies 1 to 3) were explored as well as their influence on intergender behaviour mediated through emotions (Study 3). More specifically, we hypothesised a compensation effect in that females stereotype themselves and are stereotyped by males as warmer than competent when compared to males, whereas males stereotype themselves and are stereotyped by females as more competent than warm when compared to females (Hypothesis 1); and females and males demonstrate a stronger compensation effect the more they identify with their gender ingroup (Hypothesis 2). We also hypothesised that females and males tend to hetero-stereotype the opposite gender as warmer when they perceive them as less competitive (high interdependency) relative to when perceiving them as more competitive (low interdependency) (Hypothesis 3a); and females and males tend to hetero-stereotype the opposite gender group as more competent when they perceive them as having high status relative to when they perceive them as having low status (Hypothesis 3b). Furthermore, we hypothesised that perceiving the opposite gender group as warm will predict admiration and pity which will increase facilitative behaviour (Hypothesis 4a), perceiving the opposite gender group as less warm will predict contempt and envy which will increase harming behaviour (Hypothesis 4b), perceiving the opposite gender group as competent will predict admiration and envy which will increase facilitating behaviour (Hypothesis 4c), while perceiving the opposite gender group as less competent will predict contempt and pity which will increase harming behaviour (Hypothesis 4d).

In accordance with Hypothesis 1, we demonstrated in three studies that males stereotyped indeed females as warmer (i.e., hetero-stereotype) compared to their own male group (i.e. auto-stereotype), but auto-stereotyped their group as more competent compared to females (i.e. hetero-stereotype), and as demonstrated in Study 3 this was specifically true in a context where only the gender category is considered (i.e., dichotomic context). We also demonstrated in three studies that the males' meta-stereotypes were consistent with their auto- and hetero-stereotypes because they also perceive that females view them as more competent than warm. These results imply that males in this context possess ambivalent stereotypes and apply a compensation effect in their gender stereotypes. It is, however, important to note, that males' gender stereotypes are somewhat different in a context where another social category (i.e., student) that males share with females is salient (i.e., crossed context; see Study 3), as they perceived in this condition females as equally competent as their male group, therefore eliminating the compensation effect predicted in Hypothesis 1. Inconsistent with Hypothesis 1 were the gender stereotypes held by females. We found in three studies that females do not hold ambivalent but rather univalent stereotypes (i.e., ingroup favouritism) because they stereotype their group (i.e. auto-stereotype) as warmer and more competent than they stereotype males to be (i.e. hetero-stereotype). This pattern was found regardless of the intergender context (i.e., dichotomic versus crossed context), as demonstrated in Study 3. Interestingly, in three studies the meta-stereotypes shared by females imply that they are aware that males think about them as more warm than competent, specifically in the dichotomic context.

With regard to Hypothesis 2, which predicted the presence of a stronger compensation effect the more females and males identify with their gender ingroup, we found ambiguous results for males in Studies 1 and 2. The results of Study 1 showed that there was a stronger

compensation effect the more males identified with their male ingroup, which is consistent with Hypothesis 2, whereas this was not found in Study 2. Although female participants did not exhibit a compensation effect, so not confirming Hypothesis 2, identification with their female gender group played a role in their ingroup favouritism. In both Study 1 and Study 2, females perceived their female group as more competent than males the more they identified with their female gender group. It is, however, important to note that these results should be treated with caution due to two reasons. Firstly, the distribution of the gender identification scores were skewed in that most participants identified strongly with their gender group. Thus, we were not able to clearly distinguish between participants who did not identify and very strongly identified with their gender group. Secondly, the interaction between gender groups, gender identification groups, stereotype dimensions (i.e., warmth and competence), and stereotype forms (auto-, hetero-, meta-stereotypes) reached only marginal statistical significance in Study 2. Future research is necessary to systematically explore the effects of ingroup identification on gender stereotypes.

Meanwhile, when we consider the hypotheses related to the role of interdependency (i.e., competition, Hypothesis 3a) and status (Hypothesis 3b) in gender hetero-stereotypes, we found in Study 2 that our results did not support Hypothesis 3a, but Hypothesis 3b. In both female and male samples, perceived competition between the gender groups did not predict warmth, whereas perceived status of the outgroup influenced how competent the gender outgroup is perceived.

Regarding Hypotheses 4a to 4b that explored the role of hetero-stereotypes in predicting intergender behaviour through emotions, we firstly found results in partially support of Hypothesis 4a. Although warmth hetero-stereotypes did not predict facilitative behaviour through any emotions, it directly predicted facilitative behaviour. We did not find evidence in

support of Hypothesis 4b as low warmth hetero-stereotypes did not predict harming behaviour. However, we did find evidence that partially supported Hypothesis 4c as perceiving the opposite gender group as competent did predict harming behaviour through feelings of admiration, but not through envy. Lastly, our results were inconsistent with Hypothesis 4d because we found that harming behaviour was predicted by perceiving the opposite gender group as high, rather than low, on competence which was mediated through the feelings of contempt and envy. Interestingly, we did not find any difference between females and males in our model assessing the role of hetero-stereotypes in predicting intergender behaviour through emotions. Additionally, the interaction term between perceived warmth and competence (i.e. high warmth – high competence, high warmth – low competence, low warmth – high competence, low warmth – low competence), did not directly or indirectly predict intergender behaviour.

Overall, some of our findings correspond with previous research and some imply context-specific patterns. For instance, the finding concerning the compensation effect shown by males, in the direction of viewing their group as low on warmth but high on competence, while viewing females as high on warmth and low on competence are somewhat consistent with gender stereotype research, which showed that females are stereotyped by males as higher on warmth and lower on competence (Drake et al., 2018; Eckes, 2002; Wen et al., 2020), while males are stereotyped as lower on warmth and higher on competence. However, the compensation effect shown by males was not found in a crossed intergender context. More specifically, under the condition that both the gender and student categories were salient, males viewed females as equally competent, which supports the argument that the salience of one social category over another may have implications for stereotypes (Levy et al., 2017; Prati et al., 2021). Females, on the other hand, did not display the compensation effect. Instead, we found that females in the

present research show ingroup favouritism in their gender stereotypes, similar to what was found for ethnic stereotypes (Grigoryev et al., 2019) and age stereotypes (Vauclair et al., 2018). These results imply that males within the South African context hold traditional ideas about women that strongly align with the gender stereotypes presented by the social role theory – as in other countries like the USA (Haines et al., 2016; Koenig, 2018) - which involve females being stereotyped as possessing more traits that focus on other people and their well-being (i.e. communal/warmth traits) compared to men. According to the social model theory, this is based on assuming that females play certain roles in society (Koenig & Eagly, 2014). In contrast, females within the South African context do not share these traditional ideas that are consistent with the gender stereotypes presented by the social role theory involving stereotyping males as possessing more agentic/competence traits compared to females (Koenig & Eagly, 2014).

The findings that perceived outgroup status but not interdependency influences gender hetero-stereotyping might be because of the distinct nature of the relationship between females and males as it can be argued that increased cooperation that occurs in reproduction, heterosexual relationships and familial, household and other social roles may make interdependency between females and males distinct from other intergroup relations (Cikara & Fiske, 2009; Ellemers, 2018; Ridgeway, 2001). In contrast, perceived outgroup status may influence competence hetero-stereotypes because of the value that has been placed on it in the South African context. For instance, South Africa battles with inequality and in the process of managing this inequality and improving social cohesion, there is an emphasis on improving access to resources and sense of power to those who have been previously marginalised (Fernandez, 2020; Phaswana, 2021; Segalo, 2015). In the context of gender related issues, this involves helping women access high status positions in society (Phaswana, 2021) and men

recover from emasculation endured during apartheid and thus regain their sense of power over masculinities (Segalo, 2015) This further emphasises the importance of social status, potentially making it more salient in intergender relations.

Regarding the role of hetero-stereotypes in predicting intergender behaviour through emotions, some of our findings revealed that hetero-stereotypes indeed influence behaviour through emotions, and this applies to both females and males in our sample. For instance, perceiving the opposite gender group as competent elicits the feeling of admiration for them which in turn leads to behaving in a facilitative way (i.e. help, protect, cooperate, associate) towards the opposite gender group. Meanwhile, it can also result in harming behaviour (i.e. fight, attack, exclude, demean), when the perception evokes feelings of envy, which is not consistent with the predictions of the BIAS Map (Cuddy et al., 2007). However, one could argue that there are situations such as experiencing intergroup threat or perceiving the intergroup relations from a zero-sum perspective (Roberts & Davidai, 2022) which might determine that perceiving the opposite gender group as competent elicits envy and harmful intentions (Behler et al., 2020; Yang & Guo, 2023). Although social psychologists argue that low competence perceptions predict feelings of contempt (Cuddy et al., 2008), which is consistent with the predictions of Fiske et al. (2002) and Cuddy et al. (2007), there are situations where feelings of contempt may be elicited by high competence perceptions as shown in our research. The assumption among social psychologists is that groups that are perceived as less competent are low-status groups, and therefore evoke feelings of contempt. However, it has also been argued that perceived dominance or equality evokes, for instance, contempt when the outgroup dominance or equality is perceived as illegitimate, sometimes due to competition for the perceived competence (e.g., Matsick, 2016; Miceli & Castelfranchi, 2018). Legitimacy perceptions might explain the findings

of the present study as both females and males never hetero-stereotyped the opposite gender group as relatively higher on competence. However, future research should test this explanation. Interestingly, perceiving the opposite gender group as warm directly influences facilitating behaviour, which means that perceiving the opposite gender group as having good intentions may be sufficient to act in a way that is helpful, protective, cooperative, associative towards and with the opposite gender group without feeling proud of and admiring the group.

When considering meta-stereotypes, except for females in the crossed intergender context, the way both females and males assume to be stereotyped by the opposite gender group are consistent with classical gender stereotype findings (Drake et al., 2018; Eckes, 2002; Wen et al., 2020). However, the meta-stereotypes females hold is different from their auto-stereotypes, in that they assume that males stereotype them as warmer but low in competence which is different from their perception that they are warmer but also more competent compared to males. One could argue that this discrepancy between meta-stereotypes and auto-stereotypes in females might be indicative of a successful transformation towards gender equality within the South African context. However, if so, the transformation towards gender equality occurred evidently without males noticing or sharing it – according to their hetero-stereotypes. One could also argue that this discrepancy implies that females' belief that their gender group is not perceived to be endorsed by males might lead to the presence of collective narcissism in females. Collective narcissism, which is the belief that one's ingroup is great and prominent but does not receive sufficient recognition for this (Golec de Zavala et al., 2009; Golec de Zavala & Lantos, 2020). As discussed by Golec de Zavala and Lantos (2020), this discrepancy can lead to group hostility, and therefore, potentially lead to females being hostile towards males. The hostility may also stem from viewing the high-warmth, low-competent meta-stereotype as limiting females' goals

and success, which can evoke feelings of anger (Proudfoot & Kay, 2022). This anger-induced hostility can express itself in societal and public discourses, like the #MenAreTrash movement which first emerged in 2016 on social media in South Africa and involved women highlighting perceived oppressions and lack of respect that they experience from men in different sectors of society (Reneses & Bosch, 2023). The intergroup conflict may also arise from males realising that the meta-stereotypes that they hold are not compatible with the stereotypes females hold about them (i.e., hetero-stereotypes) as females perceive them as less competent, especially since the competency dimension included agency in our studies, which is regarded as an essential trait in most social contexts. These may also present itself in instances where men aggressively respond to messages that portray them in a negative light, like in the #NotAllMen campaign which was a firm opposition on South African social media by, mostly men, in response to the #MenAreTrash movement that they perceived as insinuating that all men are bad and an attack on their sense of pride (Reneses & Bosch, 2023).

As any research, the present studies were not without limitations. Firstly, the studies mostly adopted a cross-sectional survey design, except for the part that accounted for intergender context in Study 3. This means that references to any causal changes or changes over time in gender stereotypes could not be captured (Spector, 2019). Future studies might opt for longitudinal research designs to capture any changes in gender stereotypes overtime and their impact on intergroup emotions and behaviour. Although experimental research designs would be optimal it might be difficult to manipulate gender stereotype (i.e., auto-, hetero- or meta-stereotype) directly to establish its causal link with intergender emotions or behaviour. However, experimental studies could systematically study the impact of factors such as context, status, and degree of interdependency. Secondly, all three studies were conducted as online studies which

means that we were not able to control whether the participants received input from other people during the process of responding to the survey. Future research can overcome this limitation by conducting research of this nature in a more controlled way. Thirdly, there were limitations that relate to the measures and the order of the measures used in this research. For instance, the measure of agency and competence did not consistently and distinctively represent separate measures (see Supplementary). Likewise, the constant order of the stereotype measures was another limitation because of the possibility of the anchoring effect. Therefore, future research may consider randomising the order of the auto-, hetero- and meta-stereotype measures. Likewise, the measure of interdependency may have been a limitation as we only measured intergroup competition, which presents one dimension of interdependency. Therefore, future research may consider also measuring intergroup cooperation when studying the role of interdependency in predicting warmth gender hetero-stereotypes. Lastly, our sample only included psychology students of a South African university, therefore our findings cannot be generalised to the general South African context. Future research could sample participants from different domains to overcome this limitation.

Irrespective of these limitations the present research contributes to overcoming some of the identified limitations of studies focussing on gender stereotype content. Firstly, the consideration of auto-, hetero-, and meta-stereotypes allows indeed to extend our insights on some of the dynamics involved in the intergender relations between female and male gender groups. Especially since this research demonstrated that females and males differ in how they perceive themselves and the assumptions they have about each other, which raises the need to address some of these perceptions, assumptions and expectations that do not match, especially since gender groups are interdependent. Although, the results of the present research were not consistent with regard to the

effect of gender identification on gender stereotypes, they nevertheless suggest that gender identification influences stereotype content. Thirdly, we are not aware of any study assessing auto-, hetero-, and meta-gender-stereotypes within the context of South Africa. Not only does the consideration of auto-, hetero-, and meta-gender-stereotypes give us a better understanding about gender relations from an intergroup perspective within a particular societal context but also reinforce the notion of regional differences in the content of gender stereotypes. Lastly, the present research's results that South African females and males differ indeed in their perceptions about each other might be the reason that songs addressing inaccurate perceptions that can occur between females and males – like the one by Lekman (2004, 2:17) – resonate equally strongly in both females and males.

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Supplementary

Table S1.

Exploratory factor analysis of agency/competence and communality/warmth items, Study 1

	Target Group	Sample Size	KMO's Measure	Bartlett's Test	No. of Factors as per Eigenvalues	Scree plot inflexion point
Agency/Competence	Female	200	0.75	< .001	3	2
Auto-stereotypes	Male	115	0.76	< .001	2	2
Communality/Warmth	Female	200	0.86	< .001	1	2
Auto-stereotypes	Male	115	0.89	< .001	1	2
Agency/competence	Female	110	0.83	< .001	2	2
Hetero-stereotypes	Male	192	0.77	< .001	3	2
Communality/Warmth	Female	110	0.75	< .001	2	2
Hetero-stereotypes	Male	192	0.89	< .001	1	2
Agency/competence	Female	99	0.81	< .001	2	2
Meta-stereotypes	Male	174	0.85	< .001	2	2
Communality/Warmth	Female	99	0.89	< .001	1	2
Meta-stereotypes	Male	174	0.86	< .001	1	2

Table S2.

Exploratory factor analysis of agency/competence and communality/warmth items, Study 2

	Target Group	Sample Size	KMO's Measure	Bartlett's Test	No. of Factors as per Eigenvalues	Scree plot inflexion point
Agency/Competence	Female	158	0.66	< .001	2	2
Auto-stereotypes	Male	75	0.79	< .001	2	3
Communality/Warmth	Female	158	0.86	< .001	1	2
Auto-stereotypes	Male	75	0.90	< .001	1	2
Agency/competence	Female	74	0.88	< .001	1	2
Hetero-stereotypes	Male	150	0.73	< .001	3	2
Communality/Warmth	Female	74	0.83	< .001	2	2
Hetero-stereotypes	Male	150	0.85	< .001	1	2
Agency/competence	Female	65	0.88	< .001	2	2
Meta-stereotypes	Male	131	0.86	< .001	1	2
Communality/Warmth	Female	65	0.93	< .001	1	2
Meta-stereotypes	Male	131	0.86	< .001	1	2

Table S3.

Exploratory factor analysis of agency/competence and communality/warmth items, Study 3

	Target Group	Sample Size	KMO's Measure	Bartlett's Test	No. of Factors as per Eigenvalues	Scree plot inflexion point
Agency/Competence Auto-stereotypes	Female	303	0.81	< .001	2	3
	Male	112	0.78	< .001	2	2
	Female Student	300	0.78	< .001	2	2
	Male Student	103	0.80	< .001	2	2
Communality/Warmth Auto-stereotypes	Female	303	0.84	< .001	2	2
	Male	112	0.83	< .001	2	2
	Females Student	300	0.86	< .001	1	2
	Male Student	103	0.88	< .001	1	2
Agency/competence Hetero-stereotypes	Female	106	0.87	< .001	1	2
	Male	288	0.86	< .001	1	2
	Female Student	93	0.85	< .001	2	2
	Male Student	278	0.87	< .001	1	2
Communality/Warmth Hetero-stereotypes	Female	106	0.82	< .001	2	2
	Male	288	0.91	< .001	1	2
	Female Student	93	0.85	< .001	1	2
	Male Student	278	0.92	< .001	1	2
Agency/competence Meta-stereotypes	Female	86	0.80	< .001	2	2
	Male	251	0.90	< .001	1	2
	Female Student	80	0.86	< .001	1	2
	Male Student	230	0.89	< .001	1	2
Communality/Warmth Meta-stereotypes	Female	86	0.88	< .001	1	2
	Male	251	0.89	< .001	1	2
	Female Student	80	0.89	< .001	1	2
	Male Student	230	0.90	< .001	1	2

Annexure 1a

Consent Form: Study 1

Ethics clearance reference number: 68970242_CREC_CHS_2021
Research permission reference number: 2021_RPSC_032

Title: Gender Stereotypes

Dear Prospective Participant

My name is Thembelani Ayanda Nyathi and I am Master's student at the Department of Psychology under the supervision of Prof. Kitty Dumont. We are inviting you to participate in a study that is investigating some of the stereotypes about males and females.

WHAT IS THE PURPOSE OF THE STUDY?

The study aims to get an understanding of some of the traits that we attribute to our own gender group, the opposite gender group and those we think are attributed to our own gender group by the opposite gender group.

WHY AM I BEING INVITED TO PARTICIPATE?

You have been selected to participate in this study as you form part of the target group of this study, namely Unisa students. Furthermore, since we need rather large sample sizes to be able to apply advanced statistical procedures, we must choose an accessible target group. Permission to use Unisa students as participants were obtained from the Research Permission Sub-Committee (RPSC) of the Senate Research, Innovation, and Postgraduate Degrees and Commercialisation Committee (SRIPCC).

WHAT IS THE NATURE OF MY PARTICIPATION IN THIS STUDY?

You will be presented with a link that leads you to the next pages where various information, statements, and questions will be presented to you. Your task is to read the information carefully and to answer these statements by clicking on the appropriate answer(s) provided. Please respond as honestly as possible.

The study will take a maximum of 15 minutes to complete.

CAN I WITHDRAW FROM THIS STUDY EVEN AFTER HAVING AGREED TO PARTICIPATE?

Participation in this study is entirely voluntary, and you may withdraw at any given moment without any consequences.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

Since stereotpes about certain groups form part of our interactions, it is important for us to understand these stereotypes. Therefore, as a participant of this study, you are contributing to the knowledge and understanding of the social and psychological aspects of stereotypes.

ARE THEIR ANY NEGATIVE CONSEQUENCES FOR ME IF I PARTICIPATE IN THE RESEARCH PROJECT?

To our knowledge, there are no risks or inconveniences involved in participating in this study. However, an email address will be provided in case any participants have any issues related to the study. Prof Kitty Dumont can be contacted at dumonkb@unisa.ac.za.

WILL THE INFORMATION THAT I CONVEY TO THE RESEARCHER AND MY IDENTITY BE KEPT CONFIDENTIAL?

Because we use an internet platform on which our questionnaire is up-loaded, no personal information will be asked nor up-loaded. More specifically, no personal information about you is recorded in the dataset, and therefore results can only be analyzed at a group level (e.g., females, age groups) for scientific purposes (e.g., MA dissertation, publication in scientific journals).

HOW WILL THE RESEARCHER(S) PROTECT THE SECURITY OF DATA?

During the project period, the dataset will be stored on my workstation. Data are also stored using OneDrive for back up. The computer and back up will be password secured.

WILL THE DATA BE SHARED WITH OTHERS?

There is an ethical agreement among social psychologists to share their data. After completion of data analyses but before submission of the manuscript, the dataset will be uploaded to a project page on the public repository *Open Science Framework* (osf.io). Datasets will be stored on a server located in Frankfurt am Main, Germany. The dataset will be licensed through CC-By Attribution 4.0 International, allowing sharing and re-using of the dataset with acknowledgment of the original author. Again, please keep in mind that **no information** is recorded in the dataset by which you could be personally identified.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

No incentives will be offered.

HAS THE STUDY RECEIVED ETHICS APPROVAL?

The research was reviewed and approved by the [name of ethical committee] (Unisa).

WILL I BE INFORMED OF THE FINDINGS/RESULTS OF THE RESEARCH?

Because we are not recording any personal information about you, we will not be able to contact you about the results of the research project. However, we will refer to any publication related to this research project at the home page of the Department of Psychology under the name of my supervisor: Prof Kitty Dumont.

Should you have any concerns about how the research has been conducted, you may contact the University's Toll-Free Hotline 0800 86 96 93.

Thank you for taking the time to read this information sheet and for participating in this study.

If you would like to participate in our study, you need to consent to the following:

1. **I have carefully read all information provided.**
2. **I understand all information provided.**

I consent **I do not consent**

Annexure 1b

Exit from/end of the study: Study 1

You have reached the end of this study. Thank you very much for your time and effort. Your answers will remain completely anonymous, and all information will be treated confidentially. Results will only be analysed and reported at a group level for scientific purposes (e.g., MA dissertation, publication in scientific journals).

Annexure 2a

Consent Form: Study 2

Ethics clearance reference number: 68970242_CREC_CHS_2021
Research permission reference number: 2021_RPSC_032

Title: Gender Stereotypes

Dear Prospective Participant

My name is Thembelani Ayanda Nyathi and I am Master's student at the Department of Psychology under the supervision of Prof. Kitty Dumont. We are inviting you to participate in a study that is investigating some of the stereotypes about males and females.

WHAT IS THE PURPOSE OF THE STUDY?

The study aims to get an understanding of some of the traits that we attribute to our own gender group, the opposite gender group and those we think are attributed to our own gender group by the opposite gender group.

WHY AM I BEING INVITED TO PARTICIPATE?

You have been selected to participate in this study as you form part of the target group of this study, namely Unisa students. Furthermore, since we need rather large sample sizes to be able to apply advanced statistical procedures, we must choose an accessible target group. Permission to use Unisa students as participants were obtained from the Research Permission Sub-Committee (RPSC) of the Senate Research, Innovation, and Postgraduate Degrees and Commercialisation Committee (SRIPCC).

WHAT IS THE NATURE OF MY PARTICIPATION IN THIS STUDY?

You will be presented with a link that leads you to the next pages where various information, statements, and questions will be presented to you. Your task is to read the information carefully and to answer these statements by clicking on the appropriate answer(s) provided. Please respond as honestly as possible.

The study will take a maximum of 15 minutes to complete.

CAN I WITHDRAW FROM THIS STUDY EVEN AFTER HAVING AGREED TO PARTICIPATE?

Participation in this study is entirely voluntary, and you may withdraw at any given moment without any consequences.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

Since stereotpes about certain groups form part of our interactions, it is important for us to understand these stereotypes. Therefore, as a participant of this study, you are contributing to the knowledge and understanding of the social and psychological aspects of stereotypes.

ARE THEIR ANY NEGATIVE CONSEQUENCES FOR ME IF I PARTICIPATE IN THE RESEARCH PROJECT?

To our knowledge, there are no risks or inconveniences involved in participating in this study. However, an email address will be provided in case any participants have any issues related to the study. Prof Kitty Dumont can be contacted at dumonkb@unisa.ac.za.

WILL THE INFORMATION THAT I CONVEY TO THE RESEARCHER AND MY IDENTITY BE KEPT CONFIDENTIAL?

Because we use an internet platform on which our questionnaire is up-loaded, no personal information will be asked nor up-loaded. More specifically, no personal information about you is recorded in the dataset, and therefore results can only be analyzed at a group level (e.g., females, age groups) for scientific purposes (e.g., MA dissertation, publication in scientific journals).

HOW WILL THE RESEARCHER(S) PROTECT THE SECURITY OF DATA?

During the project period, the dataset will be stored on my workstation. Data are also stored using OneDrive for back up. The computer and back up will be password secured.

WILL THE DATA BE SHARED WITH OTHERS?

There is an ethical agreement among social psychologists to share their data. After completion of data analyses but before submission of the manuscript, the dataset will be uploaded to a project page on the public repository *Open Science Framework* (osf.io). Datasets will be stored on a server located in Frankfurt am Main, Germany. The dataset will be licensed through CC-By Attribution 4.0 International, allowing sharing and re-using of the dataset with acknowledgment of the original author. Again, please keep in mind that **no information** is recorded in the dataset by which you could be personally identified.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

No incentives will be offered.

HAS THE STUDY RECEIVED ETHICS APPROVAL?

The research was reviewed and approved by the [name of ethical committee] (Unisa).

WILL I BE INFORMED OF THE FINDINGS/RESULTS OF THE RESEARCH?

Because we are not recording any personal information about you, we will not be able to contact you about the results of the research project. However, we will refer to any publication related to this research project at the home page of the Department of Psychology under the name of my supervisor: Prof Kitty Dumont.

Should you have any concerns about how the research has been conducted, you may contact the University's Toll-Free Hotline 0800 86 96 93.

Thank you for taking the time to read this information sheet and for participating in this study.

If you would like to participate in our study, you need to consent to the following:

3. **I have carefully read all information provided.**
4. **I understand all information provided.**

I consent **I do not consent**

Annexure 2b

Exit from/end of the study: Study 2

You have reached the end of this study. Thank you very much for your time and effort.
Your answers will remain completely anonymous, and all information will be treated confidentially. Results will only be analysed and reported at a group level for scientific purposes (e.g., MA dissertation, publication in scientific journals).

Annexure 3a

Consent Form: Study 3

Ethics clearance reference number: 68970242_CREC_CHS_2021
Research permission reference number: 2021_RPSC_032

Title: Gender Stereotypes

Dear Prospective Participant

My name is Thembelani Ayanda Nyathi and I am Master's student at the Department of Psychology under the supervision of Prof. Kitty Dumont. We are inviting you to participate in a study that is investigating some of the stereotypes about males and females.

WHAT IS THE PURPOSE OF THE STUDY?

The study aims to get an understanding of some of the traits that we attribute to our own gender group, the opposite gender group and those we think are attributed to our own gender group by the opposite gender group.

WHY AM I BEING INVITED TO PARTICIPATE?

You have been selected to participate in this study as you form part of the target group of this study, namely Unisa students. Furthermore, since we need rather large sample sizes to be able to apply advanced statistical procedures, we must choose an accessible target group. Permission to use Unisa students as participants were obtained from the Research Permission Sub-Committee (RPSC) of the Senate Research, Innovation, and Postgraduate Degrees and Commercialisation Committee (SRIPCC).

WHAT IS THE NATURE OF MY PARTICIPATION IN THIS STUDY?

You will be presented with a link that leads you to the next pages where various information, statements, and questions will be presented to you. Your task is to read the information carefully and to answer these statements by clicking on the appropriate answer(s) provided. Please respond as honestly as possible.

The study will take a maximum of 15 minutes to complete.

CAN I WITHDRAW FROM THIS STUDY EVEN AFTER HAVING AGREED TO PARTICIPATE?

Participation in this study is entirely voluntary, and you may withdraw at any given moment without any consequences.

WHAT ARE THE POTENTIAL BENEFITS OF TAKING PART IN THIS STUDY?

Since stereotpes about certain groups form part of our interactions, it is important for us to understand these stereotypes. Therefore, as a participant of this study, you are contributing to the knowledge and understanding of the social and psychological aspects of stereotypes.

ARE THEIR ANY NEGATIVE CONSEQUENCES FOR ME IF I PARTICIPATE IN THE RESEARCH PROJECT?

To our knowledge, there are no risks or inconveniences involved in participating in this study. However, an email address will be provided in case any participants have any issues related to the study. Prof Kitty Dumont can be contacted at dumonkb@unisa.ac.za.

WILL THE INFORMATION THAT I CONVEY TO THE RESEARCHER AND MY IDENTITY BE KEPT CONFIDENTIAL?

Because we use an internet platform on which our questionnaire is up-loaded, no personal information will be asked nor up-loaded. More specifically, no personal information about you is recorded in the dataset, and therefore results can only be analyzed at a group level (e.g., females, age groups) for scientific purposes (e.g., MA dissertation, publication in scientific journals).

HOW WILL THE RESEARCHER(S) PROTECT THE SECURITY OF DATA?

During the project period, the dataset will be stored on my workstation. Data are also stored using OneDrive for back up. The computer and back up will be password secured.

WILL THE DATA BE SHARED WITH OTHERS?

There is an ethical agreement among social psychologists to share their data. After completion of data analyses but before submission of the manuscript, the dataset will be uploaded to a project page on the public repository *Open Science Framework* (osf.io). Datasets will be stored on a server located in Frankfurt am Main, Germany. The dataset will be licensed through CC-By Attribution 4.0 International, allowing sharing and re-using of the dataset with acknowledgment of the original author. Again, please keep in mind that **no information** is recorded in the dataset by which you could be personally identified.

WILL I RECEIVE PAYMENT OR ANY INCENTIVES FOR PARTICIPATING IN THIS STUDY?

No incentives will be offered.

HAS THE STUDY RECEIVED ETHICS APPROVAL?

The research was reviewed and approved by the [name of ethical committee] (Unisa).

WILL I BE INFORMED OF THE FINDINGS/RESULTS OF THE RESEARCH?

Because we are not recording any personal information about you, we will not be able to contact you about the results of the research project. However, we will refer to any publication related to this research project at the home page of the Department of Psychology under the name of my supervisor: Prof Kitty Dumont.

Should you have any concerns about how the research has been conducted, you may contact the University's Toll-Free Hotline 0800 86 96 93.

Thank you for taking the time to read this information sheet and for participating in this study.

If you would like to participate in our study, you need to consent to the following:

5. **I have carefully read all information provided.**
6. **I understand all information provided.**

I consent **I do not consent**

Annexure 3b

Exit from/end of the study: Study 3

You have reached the end of this study. Thank you very much for your time and effort.
Your answers will remain completely anonymous, and all information will be treated confidentially. Results will only be analysed and reported at a group level for scientific purposes (e.g., MA dissertation, publication in scientific journals).