The Behavioural Effects of Perspective-Taking: The Influence of Group Membership and Stereotype Threat

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Emma L. Seddon. The Behavioural Effects of Perspective-Taking: The Influence of Group Membership and Stereotype Threat

Perspective-taking induced self-other overlap in cognitive representations has been lauded as a mechanism which promotes social bonds. The application of self (perspective-taker) to other (target of perspective-taking) leads to reduced stereotyping and prejudice, while the application of other to self increases the stereotypical behaviour of the perspective-taker (in line with the target stereotype). However, three experiments presented in this thesis suggest that this is not always the case when perspective-taker and target belong to different stereotyped groups.

Focusing on the stereotype of women and maths, Experiment 1 found that perspective-taking when the perspective-taker and target belonged to different stereotyped groups did not result in behaviour consistent with the target-stereotype. Furthermore, evidence of behavioural contrast was found. Experiment 2 further examined the behavioural effects of perspective-taking when the perspective-taker was negatively stereotyped and the target was positively stereotyped; consistent with the first experiment, contrast effects were found following perspective-taking. Given the findings of the first two experiments, hypotheses regarding the outcome of an intervention designed to reduce stereotype threat using perspective-taking were revised (Experiment 3). Findings of Experiment 3 were consistent with Experiments 1 and 2, in that perspective-taking when the target was positively stereotyped did not reduce stereotype threat for women (negatively stereotyped). The findings of the three experiments were interpreted in line with the prime-to-behaviour literature, and specifically, behavioural contrast effects following priming with exemplars.

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Dedication

To my family, for their unequivocal support.

Chapter 1: Perspective-taking

To take the perspective of another individual involves the active contemplation of the point of view of that person (Galinsky & Ku, 2004), epitomised in the colloquial expression "to walk in his or her shoes". When walking in the metaphorical shoes of another individual and deliberately considering their perspective, one would likely amass an array of personal knowledge about that person such as what their life and current circumstances are like, what emotions they experience and have experienced, what guides their perceptions and what motivates their actions (Galinsky, Magee, Inesi, & Gruenfeld, 2006). Over the past several decades, this seemingly simple cognitive process has been the subject of extensive empirical research within social psychology (e.g., Davis, Conklin, Smith, & Luce, 1996; Batson, Early, & Salvarani, 1997; Galinsky, Wang, & Ku, 2008), and is recognised to have extremely important social consequences (e.g., Davis, 1983).

Both Piaget (1932) and Mead (1934) marked the ability to take the perspective of another as a fundamental cognitive mechanism which enables an individual to advance from a state of infantile egocentrism towards the capacity for other-oriented reactions. Subsequent research has argued that perspective-taking is crucial for the refinement of moral reasoning (Kohlberg, 1976), accuracy in person perception (Bernstein & Davis, 1982), empathic concern (Cialdini, Brown, Lewis, Luce, & Neuberg, 1997) and altruistic gestures (Batson, 1991, 1998). Unsurprisingly, perspective-taking has also been found to generate a host of interpersonal relationship benefits, such as increased prosocial behaviour (Batson, Batson, Todd, Brummet, Shaw, & Aldeguer, 1995) and a tendency to engage in more pleasing social interactions (Chartrand & Bargh, 1999). In addition, research exploring the impact of perspective-taking on intergroup relations has yielded equally impressive results. Taking the perspective of a negatively stereotyped individual has been found to reduce intergroup bias

at both an individual and group level, reduce intergroup conflict and aggression, and decrease stereotyping and prejudice (Batson, Early et al., 1997; Galinsky, 2002; Galinsky & Ku, 2004; Galinsky & Moskowitz, 2000; Galinsky, Ku, & Wang, 2005; Vescio, Sechrist, & Paolucci, 2003).

1.1 Stereotype and Prejudice

Stereotypes are cognitive structures that comprise conventional and often oversimplified knowledge, beliefs, and expectations about social groups (Kunda, 1999). For example, African Americans are seen as aggressive, athletic and unintelligent (Steele & Aronson, 1995; Stone, Lynch, Sjomeling, & Darley, 1999), the elderly are thought to be slow and forgetful (Levy, 1996), and women are perceived as poor mathematicians (Steele, 1997) and negotiators (Kray, Galinsky, & Thompson, 2002). The transmission of group stereotypes throughout society is enabled by communication channels such as the media, literature and word-of-mouth (Quinn & Spencer, 2001), and propagated by the tendency for individuals to declare or express agreement with more stereotype-consistent than stereotype-inconsistent information during communication (Clark & Kashima, 2007; Ruscher, 1998). Research has suggested that stereotype *activation*, defined as "the extent to which the stereotype is on one's mind, activated and accessible" (Kunda & Sinclair, 1999, p. 14), is automatic in the presence of behaviour or features typical of the stereotyped group (Bargh, Chen, & Burrows, 1996; Devine, 1989; Pratto & Bargh, 1991). However, *application* of a stereotype, defined as "the extent to which a stereotype is used to make judgements about a member of a stereotyped group" (Kunda & Sinclair, 1999, p. 14), is argued to be a more effortful process (Devine, 1989).

The literature has identified two main benefits of stereotyping for the *stereotype holder*. First, it aids in the comprehension of unknown individuals by means of categorisation, thus

affording cognitive efficiency (van den Bos & Stapel, 2009; Wheeler, Jarvis, & Petty, 2001); this allows the stereotype holder to delegate limited cognitive resources to other pressing tasks (Macrae, Milne, & Bodenhausen, 1994). The second benefit pertains to self-enhancement (van den Bos & Stapel, 2009). Research has found that negatively stereotyping others is an effective method of enhancing personal self-esteem, as one attains a positive self-view in comparison to the target (Fein & Spencer, 1997; Schwinghammer, Stapel, & Blanton, 2006). Clearly, inaccurate stereotyping would nullify the aforementioned benefits; however, Wheeler et al. (2001) note that the benefits tend to outweigh any costs to the perceiver. The costs of stereotyping tend to be discussed in terms of the negative consequences for the *stereotyped target*, which include stereotype-based discrimination, prejudice, and stereotype threat.

1.2. Perspective-Taking and Belief-Change

A number of studies have suggested that taking the perspective of a stigmatised individual can induce a change in the beliefs of the perspective-taker, leading to reduced prejudice towards the stigmatised group of which the individual is a member. This process was explored by Batson, Polycarpou et al. (1997), who proposed that taking the perspective of a stigmatised individual arouses feelings of empathy for that person, which then generalises towards the outgroup as a whole – provided that group-membership is a primary factor for the stigma. To test their predictions, Batson, Polycarpou et al. (1997) had participants listen to an audio-tape of a stigmatised individual talking about their life and personal experiences. Prior to listening to the recording, empathy was manipulated by asking participants either to take the *perspective* of the stigmatised target, imagining how that person feels and what they have been through ("high-empathy" condition), or alternatively to consider the target from an *objective* standpoint ("low-empathy" condition). Results showed

that participants who took the perspective of an AIDS victim (Experiment 1), a homeless man (Experiment 2), or a convicted murderer (Experiment 3) reported more empathy and more positive attitudes towards people with AIDS, the homeless, and convicted murderers respectively, than participants who were instructed to remain objective. Moreover, self-reported empathy was found to mediate the relationship between perspective-taking and improvement in participant attitude, therefore supporting the predictions of Batson, Polycarpou et al. (1997).

Using the same perspective-taking manipulation as described above, Vescio et al. (2003) extended the findings of Batson and colleagues to the domain of racial prejudice. They demonstrated that White participants instructed to take the perspective of an African American college student reported more positive beliefs about African Americans generally, compared to participants in an objective condition. The finding that perspective-taking has the potential to reduce negative racial stereotyping and prejudice has since been supported by a number of similar studies, focusing on stigmatised groups such as African Americans (Dovidio et al., 2004; Shih, Wang, Bucher, & Stotzer, 2009) and non-native speakers of English (Weyant, 2007).

Employing a variation of the perspective-taking exercise described above, Galinsky and Moskowitz (2000) demonstrated the efficacy of perspective-taking as a method of reducing negative stereotyping and outgroup derogation of the elderly. Participants were presented with a photograph of an elderly man and were asked to write a short essay about a typical day in his life. One third were told to take the perspective of the photographed individual as if "walking through the world in his shoes", whilst another third were given no specific instructions as to how to write their essay (the remaining participants were allocated to a stereotype suppression condition; however, stereotype suppression is not pertinent to

the current discussion). Perspective-takers, in comparison to control participants, included less stereotypic content in a second essay written about a different elderly man. Moreover, they did not show any enhanced response to stereotype-consistent words during a lexical decision task, demonstrating evidence of perspective-taking induced implicit stereotype control (Galinsky & Moskowitz, 2000, Experiment 1).

In addition to debiasing social thought, perspective-taking has also been found to affect self-perceptions. In a series of five experiments, Galinsky et al. (2008) manipulated (Experiments 1A-1D) and measured (Experiment 1E) participants' tendency to take the perspective of a variety of individual targets belonging to either positively or negatively stereotyped groups, and demonstrated that perspective-taking leads individuals to adopt attributes typical of the target-group as self-descriptive. Participants who wrote about a day in the life of a cheerleader (Experiment 1A) or a college professor (Experiment 1B) from the perspective of the photographed target subsequently rated themselves as, respectively, more attractive or intelligent on a trait-rating task than did control participants. Experiment 1C replicated this effect using a negatively stereotyped target. Participants who took the perspective of an elderly man rated negative characteristics stereotypically associated with the elderly as more self-descriptive, demonstrating that perspective-takers assimilate the target stereotype into their self-concept regardless of stereotype valence.

Consistent with the latter findings, participants in Experiment 1D who were instructed to take the perspective of an African American male target subsequently rated themselves as possessing more stereotype-relevant (as opposed to stereotype-irrelevant) positive and negative traits, compared to non-perspective-takers. These results were conceptually replicated in Experiment 1E which employed a measure of spontaneous perspective-taking tendency (Perspective-Taking subscale of the Interpersonal Reactivity

Index: Davis, 1980) as opposed to a perspective-taking manipulation. A positive correlation was found between perspective-taking tendency and the number of stereotype-relevant traits applied to the self. Galinsky et al. (2008) reported their findings as evidence of a robust relationship between perspective-taking and including stereotypes of others in the self-concept; a pattern that emerges regardless of whether the stereotype is positive (college professors), negative (the elderly), or socially sensitive (African Americans), and whether perspective-taking is experimentally manipulated or measured.

In summary, the act of perspective-taking may lead to one of two outcomes with regard to belief-change. Firstly, it has been found that perspective-taking can lead individuals to evaluate the target in line with their own perceived attributes, resulting in reduced stereotyping and prejudice towards the target or the target's group (Batson, Polycarpou et al., 1997; Galinsky & Moskowitz, 2000; Vescio et al., 2003). Secondly, perspective-takers have been found to experience changes in their self-concept, illustrated by Galinsky et al. (2008) who found that participants who took the perspective of a stereotyped target later ascribed more stereotype-consistent attributes to themselves.

1.3 The Underlying Mechanism of Perspective-Taking: Self-Other Overlap

The potential benefits associated with debiased social thought and decreased stereotyping has prompted research into the mechanisms which underlie perspective-taking. Such investigations have largely centred on the concept of *self-other merging*. In recent years the self-concept has been conceptualised as being "responsive and fluid" (Cialdini et al., 1997, p. 482), with a capacity to temporarily reallocate cognitive resources and reconstruct self-representations depending on immediate contextual cues, for example, one's present company, or the task at hand (Cialdini et al., 1997; Markus & Wurf, 1987; Smith, 1996, 1999; Smith & DeCoster, 1998; Turner, Oakes, Haslam, & McGarty, 1994). This dynamic

conception of self has influenced recent explorations into the perceived boundaries of self and other, and the extent to which these boundaries may overlap (Aron, Aron, Tudor, & Nelson, 1991; Cialdini et al., 1997; Davis et al., 1996; Galinsky et al., 2008; Goldstein & Cialdini, 2007).

The notion of self-other merging is an abstract one, whereby an individual's self-characteristics and the characteristics of a distinct other become increasingly similar at the level of mental representation (Davis et al., 1996; Goldstein & Cialdini, 2007). Aron et al. (1991) proposed that such overlap is a corollary of close relationships, based on their finding that individuals demonstrated longer reaction-time latencies when making me/not-me decisions on non-shared traits (i.e., trait adjectives selected from Anderson's, 1968, personality-trait word list which participants rated as unlike themselves and like the other, or vice versa, on a pre-test questionnaire) when the other in question was a spouse, compared to a more casual acquaintance. Interestingly, Aron et al. (1991) continued to suggest that self-other overlap had the potential to influence both an individual's behaviour and cognition. In a similar research vein, Cialdini et al. (1997) also suggested that a merging of the conceptions of self and other results in a psychological sense of interpersonal unity, or *oneness*; however, Cialdini et al. (1997) argued that oneness may be achieved by one of two related mechanisms (or possibly both). First, the experience of interconnected personal identities may manifest as a consequence of *attachment-related cues* that signal high genetic communality, such as kinship, friendship, or familiarity. Second, the act of *perspective-taking* may facilitate a sense of oneness between perspective-taker and target, similar to that found in closely connected dyads. Despite a link between these two areas, it is important to note that Cialdini et al. (1997) focused on the empathy-altruism relationship, involving a manipulation of relationship closeness, followed by measures of oneness and helping behaviour, rather than a typical

perspective-taking manipulation. A complementary line of research – and one which is more relevant to the current line of investigation – has begun to specifically address self-other merging as a direct consequence of perspective-taking (Davis et al., 1996; Galinsky & Moskowitz, 2000; Galinsky et al., 2005; 2008), and to explore the nature and foundations of self-other overlap.

In an exploratory examination of the relationship between perspective-taking and the overlap of self and other cognitive representations, Davis et al. (1996) found that participants who were instructed to take the perspective of an unfamiliar target via a role-taking exercise were more likely to attribute traits to the target individual that they had previously described as self-characteristic (relative to participants who were first instructed to watch the actions of the target from a neutral perspective). Importantly, this effect was not mediated by increased liking of the target, nor was it greatly affected by an increase in cognitive load. The authors interpreted these findings as evidence for the increase in application of self-descriptive traits to a novel target following perspective-taking, lending strong support to the hypothesis that perspective-taking leads to an increase in self-other merging at the level of mental representation (Davis et al., 1996). This interpretation was supported by Galinsky and Moskowitz (2000) who argued that perspective-taking activates the self-concept which is then increasingly applied to the target individual. According to the authors, it is this mechanism which decreases the accessibility and expression of the outgroup stereotype, thus decreasing the tendency of the perspective-taker to derogate the outgroup of which the target individual is a member.

1.4 Direction of Self-Other Overlap

Self-other overlap is an intuitively appealing framework around which the effects of perspective-taking can be interpreted; however, the literature has yet to provide an answer to

the question regarding the *direction* in which overlap occurs. Despite drawing the conclusion that perspective-taking causes an observers' cognitions regarding a target to become more self-like, Davis et al. (1996) are comprehensive in acknowledging the two possible processes (and outcomes) that may occur when one views the world from the vantage point of another. First, overlap may occur if one's self-characteristics are increasingly applied to the other, resulting in a more *self-like* perception of the other, as demonstrated by Davis et al. (1996). Conversely, one may increasingly apply cognitions characteristic of the other to the self, and thus perceive oneself to be more *other-like* (Davis et al., 1996; Galinsky et al., 2005; 2008). These two processes (i.e., seeing more of oneself in another, and including more of the other in oneself) each motivate a merging of self and other representations, resulting in the perspective-taker and target sharing more of the same characteristics. However, distinguishing the factors which determine the direction of overlap is vital in order to attain a more complete understanding of the effects of perspective-taking.

Davis et al. (1996) proposed that the former of the two processes – ascribing self-characteristics to the other – is likely to occur when the perspective-taker and target are *strangers*, as the perspective-taker may have very little knowledge of the target's characteristics. Davis et al. (1996) further suggest that application of self-characteristics to another individual may represent a primary building block in the process of self-other merging that occurs in a close dyadic relationship over time. In addition, several lines of research suggest that the latter discussed process – ascribing target characteristics to the self – occurs when the perspective-taker and target are *familiar* with one another, or share a close relationship (Aron et al., 1991). The intimate information shared in such dyads may lead to a confusion of self and other, resulting in the other being increasingly treated as part of the

self (Aron et al., 1991; Cialdini et al., 1997; Goldstein & Cialdini, 2007; Wright, Aron, McLaughlin-Volpe, & Ropp, 1997).

Acknowledging that the two processes believed to underlie perspective taking are unlikely to be discrete phenomena, Galinsky and colleagues (2005) argued that the diverse effects resulting from perspective-taking are a consequence of a *bidirectional* merging of self and other cognitive representations. In their conceptual model of the reciprocal relationship between perspective-taking and the formation of social bonds, Galinsky et al. (2005) envisage two independent parallel pathways, representative of the two self-other merging processes which stem from the initial act of perspective taking. The first pathway of Galinsky et al.'s (2005) model depicts the application of self-representations to the other, and is based on a host of supporting evidence (Batson, Early et al., 1997; Batson, Polycarpou et al., 1997; Davis et al., 1996; Galinsky & Ku, 2004; Galinsky & Moskowitz, 2000; Vescio et al., 2003). Indeed, Galinsky et al. (2005) note that much of the research on perspective-taking induced self-other merging has focused on this process. As self-opinions tend to be positive (Galinksy & Ku, 2004), ascribing self-descriptive traits to the target has been found to result in reduced stereotypical judgements of the target, and the creation or maintenance of social bonds.

In support of bidirectional merging, the second of the two pathways suggests that self-other overlap can also be driven by the inclusion of other-representations into the self, such that the self becomes more other-like. The authors cited several lines of research as providing the foundations for this pathway, including the work of Aron and colleagues (Aron & Aron, 1986, 1996, 1997; Aron & McLaughlin-Volpe, 2001; Aron et al., 1991) and work on *self-stereotyping*, whereby traits characteristic of the group are considered to be self-descriptive (Biernat, Vescio, & Green, 1996; Pickett, Bonner, & Coleman, 2002; Turner,

Hogg, Oakes, Reicher, & Wetherell, 1987). Furthermore, in a series of unpublished studies, Galinsky, Wang, and Ku (unpublished manuscript, cited in Galinsky et al., 2005) found that perspective-taking not only resulted in target-characteristics being viewed as self-descriptive but also led to an increase in participants' stereotype-consistent behaviours, thus providing preliminary evidence for the second pathway.

Galinsky et al. (2005) thus succeeded in amalgamating two discrete lines of research within a comprehensive bidirectional model of self-other overlap. Furthermore, this model is applicable to, and can adequately account for, the diverse spectrum of cognitive and behavioural (discussed below) effects that have been associated with perspective-taking. For example, when considered simultaneously, the first pathway (through application of the self to the other) leads to decreased intergroup bias, while the second pathway (through inclusion of the other in the self) leads to an increase in stereotype-consistent behaviours. Galinsky et al. (2005) contend that such outcomes of perspective-taking play a key role in the co-ordination of behaviour and the creation and maintenance of multicultural social bonds.

1.5 Behaviour Change

Galinsky et al.'s (2005) model suggests that perspective-taking results in a change of beliefs, firstly in terms of applying self-representations onto the other, so that targets are represented as being more self-like, and secondly in terms of including other-representations in the self, so that the self becomes more other-like. This accounts for the findings previously discussed, which demonstrate that perspective-taking can aid in the debiasing of social thought (Batson, Polycarpou et al., 1997; Vescio et al., 2003), decrease stereotyping of target individuals and groups (Davis et al., 1996; Galinsky & Moskowitz, 2000), and lead perspective-takers to adopt the stereotypical traits of targets (Galinsky et al., 2008).

Galinsky et al. (2005) also note that perspective-taking can result in a change in *behaviour*, such that the perspective-taker applies other-representations to the self and subsequently behaves in ways consistent with the stereotyped target. Research examining the effects of perspective-taking on behaviour stems from prime-to-behaviour research. Prime-to-behaviour research consists of studies which have established that priming (defined by Bargh et al., 1996, as "the incidental activation of knowledge structures, such as trait concepts and stereotypes, by the current situational context", p. 230) can produce complex behaviour which is either consistent (assimilation) or inconsistent (contrast) with the target stereotype. Early reports focused on *assimilation* effects, wherein priming with a group stereotype leads to behaviours consistent with that stereotype. For example, an early study by Bargh et al. (1996) found that college students who were primed (through a scrambled sentence task) with the stereotype of the elderly walked away from the experimental location at a slower pace than non-primed participants. Similarly, students primed with the stereotype of a college professor have been found to perform better on a subsequent analytical task, whereas students primed with the stereotype of a soccer hooligan underperformed on the same task relative to non-primed participants (Dijksterhuis & van Knippenberg, 1998). Such effects have now been replicated numerous times using a range of stereotype and trait primes, and measuring a large set of behaviours (e.g., Chen & Bargh, 1997; Hansen & Wänke, 2009; Levy, 1996; see Dijksterhuis & Bargh, 2001, for a review). These studies suggest that the prime activates the relevant stereotype, which then leads the participant to engage in behaviours consistent with the stereotypical construct.

This line of research was advanced by Wheeler et al. (2001). The authors instructed White participants to write about a day in the life of a student named either Tyrone (a typically African American name) or Eric (who was presumably White), to prime the African

American stereotype of academic underperformance in the former group. All participants then sat a difficult maths test. Results showed that participants who wrote about Tyrone scored significantly lower on the maths test than those who wrote about Eric, demonstrating that non-stereotyped individuals primed with a target stereotype are likely to display target-stereotype-consistent behaviours. Interestingly, additional analyses of narrative essay content showed that performance decrements were most pronounced for participants who wrote about Tyrone from a first-person perspective ("I") compared to those who used a third-person perspective ("He"). Spontaneous use of the first-person perspective may indicate that the participant has taken the perspective of Tyrone, and assimilated the negative stereotype into their self-representation (Galinsky & Ku, 2004); however, as Wheeler et al. (2001) did not explicitly manipulate perspective-taking, it is possible that other factors influenced participant behaviour, such as the degree of elaboration in the written essays (Wheeler et al., 2001).

1.6 The Role of the Self-Concept in Stereotype Prime-to-Behaviour Effects

Perspective-taking was not the primary focus of Wheeler et al. (2001); instead, the study succeeded in highlighting the central role of the active self-concept in inducing behavioural change following stereotype priming. This idea was further explored in a review by Wheeler, DeMarree, and Petty (2007) who present an *active-self* account of stereotype, trait, and exemplar prime-to-behaviour effects. The active-self model details a perceptual route for prime-to-behaviour effects whereby the self-concept is responsive to changes in the social environment, and adjusts accordingly. The active-self account distinguishes between the *chronic* self-concept, which includes all self-concept information that is stored in long-term memory, and the *active* self-concept, which includes aspects of the self-concept that are readily accessible (Wheeler et al., 2007). The functional dissociation between the two facets

of the self-concept is apparent when one considers the influence of each on behaviour; while chronic self-concept representations are stable over time and determine a person's trait characteristics, active self-concept representations are more susceptible to change depending on the current situation. Active self-concept representations will partly determine how one perceives and acts in any given situation; therefore, the active self-concept is believed to have a considerable influence on behaviour (Wheeler et al., 2007; Smeesters, Wheeler, & Kay, 2010).

The critical role attributed to the active self-concept in Wheeler et al.'s (2007) active-self account represents a marked departure from earlier direct (unmediated) activation theories of prime-to-behaviour effects, such as the *ideomotor account* (Carpenter, 1874; Dijksterhuis & Bargh, 2001; James, 1890/1950). Direct accounts posit that primes (in the form of concrete behavioural, or abstract stereotypical constructs) activate stored behavioural representations, which affect behaviour directly without the involvement of any perceptual processes (for a review of the ideomotor mechanism, see Wheeler & Petty, 2001). The simplicity of a direct activation account of prime-induced, stereotype-consistent behaviour is undoubtedly attractive. However, research demonstrating that primes do not always lead to assimilative effects (e.g., Dijksterhuis, Spears et al., 1998; Dijksterhuis & van Knippenberg, 2000; LeBouef & Estes, 2004) exposes a weakness in the direct model, which fails to provide an explanation. Such behavioural *contrast* (counter-assimilative) effects are typically attributed to a spontaneous comparison process which occurs upon presentation of a social target which the primed individual considers to be dissimilar to themselves (Gilbert, Giesler, & Morris, 1995). Behavioural contrast effects are easily incorporated into the active-self model on the basis that primes may lead to shifts in the active self-concept in the opposite direction to the prime (Smeesters et al., 2010). In short, the active-self account

proposes that behavioural assimilation to the prime is the result of the inclusion of prime content in the active self-concept, while behavioural contrast follows from the inclusion of prime-incongruent content (and correspondingly, exclusion of prime-congruent content) in the active self-concept (Wheeler et al., 2007).

Research exploring self-relevant moderators of prime-to-behaviour effects has provided further evidence that primes can affect behaviour indirectly via their effects on the self-concept. In a review of indirect prime-to-behaviour effects, Smeesters et al. (2010) noted that self-related moderators generally fall into one of three categories: (1) distinctiveness from the prime, (2) information processing orientation, and (3) features of the chronic self-concept representation.

Firstly, individuals who perceive their chronic self-representations to consist of features which are similar to the features of a prime are more likely to assimilate the prime into their self-concept and demonstrate stereotype-consistent behaviours than individuals who perceive their chronic self-representations to be distinct from the prime (Hall & Crisp, 2008; Schubert & Hafner, 2003; Spears, Gordijn, Dijksterhuis, & Stapel, 2004). For example, participants primed with abstract stereotypical constructs tend to demonstrate stereotype assimilation, whereas those primed with discrete exemplars of the same stereotypes are more likely to demonstrate contrast effects (Dijksterhuis, Spears et al., 1998).

Secondly, the manner in which stereotype prime content is processed by an individual has also been found to mediate prime-to-behaviour effects. This was illustrated in a recent study by Wheeler and colleagues, who found that individuals with a tendency to process prime content information in a self-relevant way showed more stereotype-consistent behaviours than individuals who did not possess a tendency for self-reflection (Wheeler, Morrison, DeMarree, & Petty, 2008).

Finally, features of the chronic self-concept have been found to moderate prime-to-behaviour effects. Smeesters, Yzerbyt, Corneille, and Warlop (2009) found that individuals with more accessible self-concept representations were more likely to reject the prime in favour of their self-representations as a guide for behaviour; conversely, individuals with less accessible representations were more likely to demonstrate target-stereotype-consistent behaviour. Furthermore, research has demonstrated that individuals who report conflicting self-representations in stereotype-relevant domains are more likely to shift their self-representations in line with the prime construct and demonstrate greater prime-to-behaviour effects, compared to individuals low in ambivalence (DeMarree & Loersch, 2009). In concert, the evidence from the three domains provides strong support for the central role of the active self-concept in prime-to-behaviour effects.

The idea that active self-concept representations can accommodate prime content and consequently influence behaviour is intriguing, and bears a number of similarities to the self-other overlap mechanism believed to underlie the effects of perspective-taking. Both theories – that of behavioural priming and of perspective-taking – posit that changes to the individual self-concept are fundamental to explaining observed behavioural effects. Furthermore, the finding that prime-content information processed in a self-relevant way is likely to be incorporated into the self-concept and used to influence behaviour (Wheeler et al., 2008) is comparable to the idea that putting oneself in the shoes of another will lead to a merging of self and other, and a subsequent increase in stereotype-consistent behaviour.

1.7 Behaviour and Perspective-taking

The prime-to-behaviour literature, in establishing the potential for behaviour-change in individuals primed with a stereotyped target, laid the foundation for research directly exploring the effects of perspective-taking on behaviour. Employing a design based on that

of Wheeler et al. (2001), Marx and Stapel (2006) purposefully manipulated perspective-taking by having male and female participants write about a day in the life of a male target (Paul) from either a first-person ("I" focus) or third-person ("He" focus) perspective. Participants then completed a diagnostic emotion test and self-report measures of emotional sensitivity and self-perceived stereotypical characteristics. As men are stereotypically seen as less emotionally sensitive than women, Marx and Stapel (2006) predicted that male participants would underperform on the emotion test compared to women regardless of perspective-taking condition, due to their status as targets of the negative stereotype. However, as women are *not* negatively stereotyped in the domain of emotional sensitivity it was predicted that women in the first-person condition would perform worse on the emotion test than women in the third-person condition, due to those in the first-person condition taking the perspective of Paul and therefore "becoming" targets of the negative stereotype. It was also expected that female participants taking the perspective of Paul would *feel* more "male-like".

Findings supported these hypotheses. Regarding changes in *self-perception*, female participants who took Paul's perspective reported having better analytic ability (a stereotypically male characteristic) and less emotional sensitivity (a stereotypically female characteristic) than female participants in the third-person condition, suggesting that female participants' self-representations became more male-like subsequent to taking the perspective of a stereotyped male target. Furthermore, regarding changes in *behaviour*, female participants in the third-person condition outperformed female participants who wrote about Paul from the first-person perspective on the emotion test. This demonstrates that non-stereotyped individuals (women) who take the perspective of a negatively stereotyped target (man) underperform on a domain-relevant test, therefore displaying stereotype-consistent behaviours (at least for the negative stereotype pertaining to men's emotional

sensitivity). In contrast to earlier studies which investigated self-other overlap with a focus on the perspective-taker seeing more of themselves in the stereotyped target (e.g., Davis et al., 1996; Galinsky & Ku, 2004; Galinsky & Moskowitz, 2000), Marx and Stapel (2006) conceive cognitive overlap to occur in the direction of other-characteristics being increasingly applied to the self, such that the perspective-taker becomes stereotyped and displays behaviours typical of the target in question. This is consistent with the second pathway of the conceptual model proposed by Galinsky et al. (2005), whereby the inclusion of target characteristics within the self-concept following perspective-taking leads one to behave in a manner consistent with the target stereotype.

This line of investigation was advanced in a collection of experiments by Galinsky and colleagues (2008), who conducted a comprehensive and systematic exploration of the cognitive and behavioural consequences of taking the perspective of a stereotyped target. The first five experiments (1A-1E) demonstrated that a target's stereotype-relevant characteristics are increasingly applied to the self-concept of a perspective-taker following perspective-taking, regardless of the nature or valence of the stereotype in question. Based on this evidence, Galinsky et al. (2008) theorised that perspective-taking would also lead participants to *behave* in a manner consistent with the target's stereotype, and that stereotype-consistent behaviours would be target specific. To test this hypothesis, Galinsky et al. (2008, Experiment 2A) manipulated perspective-taking using a paradigm based on that employed by Batson, Early et al. (1997). Participants listened to an audio-tape of the stereotyped target – in this case an assistant professor in political science – after being instructed to either imagine how they would feel and think if they were the target (perspective-taking self), imagine how the target would be thinking and feeling (perspective-taking other), or to listen to the tape objectively (objective control). Participants in both of the perspective-taking

conditions answered more questions correctly on a subsequent analytical reasoning test than did objective control participants, in line with the stereotype of professors as intelligent and knowledgeable. In order to discount the possibility that superior performance on the analytic test was simply a result of increased cognitive processing induced by active perspective-taking, Galinsky et al. (2008, Experiment 2B) had participants take the perspective of a cheerleader. Considering that cheerleaders are stereotypically seen as unintelligent and lacking in analytic ability, it was predicted that participants who took the perspective of a cheerleader would underperform on the same analytical test as presented in Experiment 2A. Results supported this hypothesis, and furthermore, established the relationship between perspective-taking and stereotype-consistent behaviour as target-specific.

In sum, Marx and Stapel (2006) and Galinsky et al. (2008, Experiments 2A-B) established that the act of perspective-taking – which previous research had found to induce changes both in perspective-takers' self-concepts and in their beliefs about the stereotyped target (Batson, Polycarpou et al., 1997; Davis et al., 1996; Galinsky & Moskowitz, 2000; Galinsky et al., 2008; Vescio et al., 2003) – leads the perspective-taker to engage in stereotype-consistent behaviours which are target-specific. In explanation of these behavioural effects it has been argued that the target characteristics are increasingly applied to the self-concept during perspective-taking as part of the process of self-other overlap, such that the perspective-taker becomes a victim of the target stereotype (Galinsky et al., 2008; Marx & Stapel, 2006). Interestingly, perspective-taking induced, stereotype-consistent behaviours have been demonstrated whether the stereotype in question is positive (e.g., Galinsky et al., 2008, Experiment 2A) or negative (e.g., Galinsky et al., 2008, Experiment 2B). However, the literature has yet to address the effects of perspective-taking on behaviour when the perspective-taker is a member of a negatively stereotyped group, while the target is

a member of a positively stereotyped group. While Marx and Stapel (2006) focused on a gender stereotype (males are less emotionally sensitive than females) and had both male and female participants complete the perspective-taking manipulation, all participants (regardless of gender) were presented with a male (negatively stereotyped) target. Therefore, it would be interesting to assess the effect of taking the perspective of a positively stereotyped target. Specifically, Marx and Stapel (2006) and Galinsky et al. (2005; 2008) hypothesise that perspective-taking can result in a change in behaviour, so that the perspective-taker applies other-representations onto the self, and therefore behaves in ways consistent with the target. However, this previous research either does not examine the perspective-taker's own group membership (Galinsky et al., 2005; 2008) or only examines a situation where the target is a negatively stereotyped group member (Marx & Stapel, 2006). Therefore, the current research examines the behaviour of perspective-takers who are themselves negatively stereotyped, while the target is from a positively stereotyped group. This allows the idea of self-other overlap to be explored further, in terms of whether such a situation would also lead the perspective-taker to apply other-representations onto the self.

1.8 Current Research

The three experiments reported in this thesis had two main aims. The first aim was to explore the effects of perspective-taking on behaviour with a focus on the perspective-taker as a member of a negatively stereotyped group, while the target of perspective-taking was from a positively stereotyped group. This aim was primarily addressed in Experiments 1 and 2. The second aim was to examine perspective-taking in the context of developing an intervention designed to reduce the negative effects of stereotype threat. This aim was addressed in Experiment 3 (see Chapter 2 for a discussion of the stereotype threat literature, and an overview of Experiment 3). In addressing these aims, the research presented here

furthers the current understanding of the complex behavioural consequences of perspective-taking.

The current research focused on the stereotype that women are poorer at mathematics than men. This decision was based on three main factors. The first concerned the need to categorise participants (and the target of perspective-taking) as being from either a positively or negatively stereotyped group; as previous research has suggested that women are seen as negatively stereotyped when it comes to mathematics (Grimm, Markman, Maddox, & Baldwin, 2009; Keller 2007; Logel, Iserman, Davies, Quinn, & Spencer, 2009; Spencer, Steele, & Quinn, 1999), and men are seen as positively stereotyped (Croizet et al., 2004; Steele & Aronson, 1995), participant gender was chosen. Secondly, research into the behavioural effects of perspective-taking has examined a number of stereotyped targets (e.g., cheerleaders, college professors, African Americans: See Galinsky et al., 2008); however, the stereotype regarding women's maths ability has not yet been explored within this area. Finally, the potential for perspective-taking to improve women's maths performance deserves further investigation as part of the continued exploration of the gender-gap in maths achievement and the underrepresentation of women in maths based degree courses and careers (Burkley, Parker, Stermer, & Burkley, 2010; Good, Aronson, & Inzlicht, 2003; Rosenthal, Crisp, & Suen, 2007).

Extending the basic design of Marx and Stapel (2006) to include either a negatively or a positively stereotyped target (rather than just a negatively stereotyped target), Experiment 1 manipulated the perspective-taking of male and female participants (via instruction to write about the target from either a first-person or third-person perspective) prior to taking a difficult maths test. Given the findings of Marx and Stapel (2006), Galinsky et al. (2008), and the predictions of Galinsky et al.'s (2005) model of self-other merging, it

seems reasonable to suggest that perspective-taking would lead to stereotype-consistent behaviours, such that writing about a male (positively stereotyped) target from a first-person perspective would lead to higher maths test scores than writing about a male target from a third-person perspective. However, as men are already positively stereotyped in this context, taking the perspective of a male target (i.e., same positive group membership) was not expected to affect performance of male participants. Conversely, women taking the perspective of a male target (i.e., different group membership) were expected to demonstrate an improved score on the maths test compared to women in the third-person condition, as a result of becoming positively stereotyped following increased application of target-characteristics to the self. That is, while perspective-taking induced self-other overlap renders the stereotype self-relevant for women in the first-person condition, writing about the target from the third-person perspective is not expected lead to self-other overlap, and the stereotype will remain non-relevant (in line with the theorising of Marx and Stapel, 2006).

Participant gender is predicted to similarly influence behaviour when the target is female (negatively stereotyped). That is, stereotype-consistent behaviours are expected to occur for female participants regardless of perspective-taking condition, as they already contend with a negative stereotype in the domain of maths. However, because male participants are not targeted by this negative stereotype, perspective-taking should affect behaviour. Male participants in the first-person condition are expected to take on the stereotyped characteristics of the female target and perform worse on the maths test relative to men in the third-person perspective condition.

Experiment 2 followed on from the findings of Experiment 1, exploring the effects of perspective-taking on participant behaviour, with a specific focus on the performance of female participants (negatively stereotyped) when the target of perspective-taking is male

(positively stereotyped). Experiment 2 employed a modified perspective-taking manipulation, which saw the third-person perspective condition replaced by an objective condition in order to better control for perspective-taking. In addition, a more stereotypical target was used, in that a male maths student was presented rather than simply a male student. These modifications allowed for a more controlled exploration of the behavioural effects of perspective-taking. As with Experiment 1, based on the Galinsky et al. (2005) model, it was expected that women in the first-person condition would demonstrate stereotype-consistent behaviour, and outperform women in the objective condition on the maths test. Finally, Experiment 3 examined perspective-taking and stereotype threat, a phenomenon which is covered in the following chapter.

Chapter 2: Stereotype Threat

The previous chapter reviewed research into perspective-taking, with an overarching focus on the reduction of stereotyping and prejudice. The various outcomes of perspective-taking were discussed, including belief change (i.e., attributing self-characteristic traits to the target and vice-versa, and demonstrating more positive beliefs about the target) and behaviour change (i.e., the demonstration of target-specific, stereotype-consistent behaviours following perspective-taking). These effects were explained in terms of the concept of self-other merging at the level of mental representation, and the idea of self-other overlap being a bidirectional process was discussed. Finally, a brief overview of the current research was presented, and the two main aims of this thesis introduced; the first aim was to explore the effects of perspective-taking on behaviour, with a focus on the target of perspective-taking being of a positive (versus negative) group membership, and the second aim was to examine perspective-taking as the basis for a potential stereotype threat intervention strategy. This second aim is explored further in this chapter. Drawing on the perspective-taking literature, there are a number of good theoretical reasons why taking the perspective of a positively stereotyped target may reduce the negative effects of stereotype threat in vulnerable group members. Therefore, the current chapter examines research into stereotype threat, focusing on intervention methods which have demonstrated previous success, and closes with an overview of the perspective-taking intervention method explored in Experiment 3.

2.1 Stereotype Threat

In the seminal paper, Steele and Aronson (1995) examined the relative performance of African American and White students on a difficult test of intelligence – a domain in which African Americans are negatively stereotyped. They found that when the test was presented as diagnostic of intellectual ability, African Americans significantly

underperformed relative to White participants, and relative to African Americans in a non-diagnostic condition. The authors argued that framing the test as diagnostic of intelligence activated the associated racial stereotype of Black Americans being unintelligent, inducing a disruptive fear of a risk of confirming the stereotype as self-relevant. Furthermore, a second study (Steele & Aronson, 1995, Experiment 4) found that simply having participants indicate their race prior to the test was sufficient to induce performance decrements in African American students, compared to the performance of White participants and of African Americans who were not asked to state their race.

The manipulations employed by Steele and Aronson (1995) had negligible effects on the test performance of White participants in either study, leading the authors to conclude that activation of the negative racial stereotype led to performance interference and reductions on stereotype-related ability tests. To account for this effect, Steele and Aronson (1995) introduced the concept of *stereotype threat*, a self-evaluative threat triggered by environmental cues which make salient the devaluing in-group stereotype. They observed that such cues are evident in situations where an individual risks confirming their in-group stereotype as self-relevant, and concluded that the thought of being perceived or evaluated by others through the lens of a negative stereotype interferes with performance in evaluative testing situations.

Stereotype threat theory adopts a situationist explanation for the underperformance of negatively stereotyped groups, marking a departure from biological and sociocultural theories of group differences in ability. Defined as a "threat in the air" (Steele, 1997, p. 614), stereotype threat can affect *any* individual belonging to a group about whom a negative societal stereotype exists, given an environment which is conducive to the elicitation of the stereotype. To experience stereotype threat an individual must recognise that a negative

stereotype regarding their group is applicable to their current situation. They must also be aware of the potential for self-fulfilment of the stereotype, and consequent judgement by others (Wheeler & Petty, 2001). In addition, Aronson, Lustina, Good, and Keough (1999) demonstrated that a history of stigmatisation is neither necessary nor sufficient for the experience of stereotype threat in a study that established the underperformance of White men (a group not historically stigmatised) on a difficult maths test when informed that Asian participants generally score higher than White participants. Conversely, White men who were not exposed to this information did not underperform on the test. Finally, research has supported Steele and Aronson's (1995) hypothesis that a person need not endorse the stereotype, nor believe it to be true of themselves, in order to experience feelings of threat. For example, Huguet and Régner (2009) found evidence of stereotype threat in adolescent girls who overtly denied the negative gender stereotype that females are poor at maths.

2.2 The Targets of Stereotype Threat

Over the last fifteen years, stereotype threat has become one of the most widely researched topics in social psychology (Schmader, 2010), with empirical demonstrations highlighting the existence of stereotype threat in diverse settings "crossing race, ethnicity, gender and culture" (Rosenthal & Crisp, 2006, p. 502). When reminded of their gender group membership, women have been found to underperform in cognitive domains such as visuospatial ability (Campbell & Collaer, 2009; McGlone & Aronson, 2006) and engineering exams (Bell, Spencer, Iserman, & Logel, 2003), as well as non-cognitive domains including negotiations (Kray, Thompson, & Galinsky, 2001; Kray, Reb, Galinsky, & Thompson, 2004), driving (Yeung & von Hippel, 2008), and tests of political knowledge and awareness (McGlone, Aronson, & Kobrynowicz, 2006). Experimentally increasing the situational salience of gender has likewise established the prevalence of stereotype threat in men faced

with affective tasks (Leyens, Désert, Croizet, & Darcis, 2000), tasks related to social sensitivity (Koenig & Eagly, 2005), and also verbal-linguistics (Keller, 2007).

With regard to investigations focused on racial group stereotypes, stereotype threat has been found to adversely affect the academic performance of African American and Hispanic groups (Aronson, Fried, & Good, 2002; Cadinu, Maass, Frigerio, Impagliazzo, & Latinotti, 2003; Cohen, Garcia, Apfel, & Master, 2006; Gonzales, Blanton, & Williams, 2002; Walton & Spencer, 2009), as well as Latinos (Aronson, Quinn, & Spencer, 1998). Analogous results have been produced for White participants stereotyped as poor natural athletes (Beilock, Jellison, Rydell, McConnell, & Carr, 2006; Stone et al., 1999), or as racist (Frantz, Cuddy, Burnett, Ray, & Hart, 2004), in addition to the aforementioned findings of Aronson et al. (1999) who pitted White men as inferior to Asian men in mathematics.

In addition, studies have demonstrated stereotype threat effects in students from low socioeconomic backgrounds stereotyped as having poor academic ability (Croizet & Claire, 1998; Harrison, Stevens, Monty, & Coakley, 2006; Desert, Preaux, & Jund, 2009), the elderly stereotyped as having poor memory (Hess, Auman, Colcombe, & Rahhal, 2003; Levy, 1996), gay men stereotyped as inadequate child minders (Bosson, Haymovitz, & Pinel, 2004), and mentally ill patients stereotyped as incompetent (Quinn, Kahng, & Crocker, 2004).

Although stereotype threat has been observed in a number of stereotyped domains, of particular interest here is academic underperformance. Academic underperformance has been demonstrated in a range of settings, including laboratory studies (Schmader & Johns, 2003; Steele & Aronson, 1995), quasi- and real classroom environments (Cole, Matheson, & Anisman, 2007; Good, Aronson, & Harder, 2008; Huguet & Régner, 2007; Keller, 2007; Neuville & Croizet, 2007) and on high-stakes standardised tests (Good et al., 2003). However, it has also been argued that chronic exposure to stereotype threatening situations

can lead individuals to adopt longer-term defensive mechanisms, damaging their potential for progression in the stereotype-relevant domain.

One such mechanism, identified by Major and colleagues (Major, Spencer, Schmader, Wolfe, & Crocker, 1998), is *domain disengagement*. Defined as an extreme protective strategy (Major & Schmader, 1998), disengagement involves isolating performance in the threatened domain such that it no longer contributes to self-worth. As a protective strategy there is evidence that short-term psychological disengagement can be healthy and adaptive, allowing threatened individuals to maintain positive self-views in adverse environments (Major et al., 1998; Nussbaum & Steele, 2007); however, when an individual is faced with long-term exposure to the devaluing stereotype of his or her in-group, research shows that protective disengagement can lead to *disidentification* with the stereotyped domain. Disidentification is a coping-mechanism, defined by Steele (1997) as a "reconceptualization of the self and of one's values so as to remove the domain as a self-identity" (p. 614). While disidentification serves to protect the individual from stereotype threat in a similar manner to that of disengagement (i.e., by re-defining the self-concept such that achievement in the stereotyped domain is not valued), dropping a domain as a basis of self-esteem may have the unfortunate effect of diminishing interest and consequent achievement in the stereotyped area (Steele & Aronson, 1995); an idea that has been supported in a number of studies (Davies, Spencer, & Steele, 2005; Steele, James, & Barnett, 2002).

2.3 Stereotype Threat Interventions

Due to the negative consequences of stereotype threat, a number of researchers have investigated possible interventions designed to alleviate the effects of stereotype threat. In his theorising, Steele (1997) argued that susceptibility to stereotype threat is essentially determined by the salience and applicability of a negatively stereotyped group identity within

the test domain, amalgamated with a high level of personal concern about how actions may be interpreted by observers as confirmation of the stereotype. One important implication of this theoretical tenet, and what differentiates stereotype threat from many biological explanations for group-based performance differences, is that the situational *threat in the air* should be amenable to interventions which focus on rendering the negatively stereotyped group identity irrelevant within the testing environment. Indeed, should all stereotypic cues be removed from the testing environment, it follows that stereotype threat would be eliminated and performance in the domain would improve; however, this would require the means to alter society's perceptions toward stereotyped social groups, which is generally considered an unrealistic feat (Davies et al., 2005; Kit, Tuokko, & Mateer, 2008). Research has therefore attempted to reduce the negative effects of stereotype threat using intervention methods which aim to: (1) structure the stereotype threatened individual's perceptions about negative stereotypes and their applicability to the test situation; (2) structure the stereotype threatened individual's beliefs about the threat; (3) de-emphasise threatened social identities.

2.3.1 Structuring the stereotype threatened individual's perception of negative stereotypes and their applicability to the test situation. A number of studies have successfully reduced stereotype threat effects by modifying the threatened individual's perception of the test situation such that negative stereotypes and group identities are ostensibly irrelevant. One way to implement this strategy is to attack the veracity of the negative stereotype that links the social group to the test domain. For example, female students who were informed that an upcoming maths test had *not* produced any gender differences in past research performed just as well as male students on the test, and significantly better than female students who were given no information regarding gender differences (Spencer et al., 1999). This finding has been replicated in similar experiments

(e.g., Campbell & Collaer, 2009; Quinn & Spencer, 2001), including one test that was explicitly presented as diagnostic of ability (Good et al., 2008). However, this method of reducing stereotype threat is unlikely to transfer successfully to real-world testing situations due to the widespread knowledge of gender and racial differences on certain standardised tests of ability.

An alternative approach to altering stereotype threatened individuals' perception of the situation is to re-frame the threat as a challenge. Recognising the contradictory consequences of adopting a *threat* mindset (associated with an increase in cognitively taxing, stress-related responses) versus a *challenge* mindset (perceived as facilitative and adaptive) when faced with a difficult task, Alter and colleagues hypothesised that reframing an otherwise stereotype-threatening test as a challenge would improve performance (Alter, Aronson, Darley, Rodriguez, & Ruble, 2010). Results supported this hypothesis; typical stereotype threat effects were found for minority-group students (high school underrepresented at a prestigious university) on an academic test, but reframing the test as a challenge significantly reduced the performance deficit. It therefore appears that manipulating the perception of the situation, either through undermining the stereotype or encouraging a challenge mindset, can reduce underperformance among stereotyped individuals.

In addition, studies have shown that providing an external attribution for task-related difficulties and anxiety can help mitigate stereotype threat effects (Good et al., 2003; Johns, Schmader, & Martens, 2005). This principle was recently illustrated in women set to take a difficult maths test in a male-dominated environment (Ben-Zeev, Fein, & Inzlicht, 2005). Half of the female participants were informed that any anxiety or nervous arousal experienced during the test may be attributed to the presence of a "subliminal noise

generator" (misattribution group), whilst the remaining half did not receive any means to account for their anxiety (control group). Findings revealed that women in the misattribution group were more likely to attribute nervous feelings to the subliminal noise, and to perform better on the maths test than women in the control group. Furthermore, female participants in the misattribution group performed as well on the test as male participants and non-stereotype threatened female participants, leading Ben-Zeev et al. (2005) to conclude that the intervention helped to "lift the burden of stereotype threat" (p. 180).

Finally, a related approach involves educating vulnerable individuals about stereotype threat. Support for this method was provided by Johns et al. (2005), who examined the maths performance of women who had been taught about stereotype threat and its effects, versus women who had received no pre-test education. When the maths test was described as diagnostic of ability, typical stereotype threat effects were found in women who did not receive the teaching manipulation; however, women who understood the anxiety-inducing effects of the situational threat performed as equally well as men. The authors argued that the teaching manipulation provided women with a blatant misattribution cue, supplying a situational explanation for anxiety which might otherwise have been interpreted in terms of the ability-limiting negative stereotype associated with their gender.

2.3.2 Structuring the stereotype threatened individual's beliefs about the threat. A second line of work has attempted to reduce stereotype threat effects by restructuring the beliefs and emotional responses of stereotype threatened individuals to the negative stereotype. Research has highlighted individual differences in lay beliefs about the plasticity of personal traits, revealing that the extent to which personal traits are perceived as malleable versus fixed impacts the way in which challenges are responded to and performance outcomes are dealt with (Dweck, 1986; 1999; Dweck & Leggett, 1988). For

example, Aronson et al. (2002) found that belief in the malleability of intelligence (a negatively stereotyped trait for African Americans) led Black students to demonstrate superior academic performance, and report greater enjoyment of academia, than Black students who did not partake in the intervention. These effects were conceptually replicated in a real-world setting by Good et al. (2003), who demonstrated that female students exposed to a mentoring programme designed to emphasise the expandability of intelligence and plasticity of brain development earned higher scores on an end-of-year maths test than female students who were not enrolled in the programme. Importantly, female students who received the intervention performed as well on the test as their male peers. Also consistent with the idea that an entity perspective exacerbates stereotype threat, Burkley et al., (2010) found that women with fixed-trait beliefs were more likely to disengage from the maths domain following failure. Taken together these studies suggest that belief in the malleability of traits can have a profound effect on performance, and that stereotype threat can be reduced by encouraging an incremental perspective.

Another intervention technique involves the use of in-group role models who are proficient in the stereotyped domain. Marx and Roman (2002) found that women scored significantly higher on a maths test when the test was administered by a competent female mathematician (i.e., a positive in-group role-model) than when the test was administered by a man. Furthermore, female participants who witnessed a female administrator performed equivalently to male participants. Analogous results have since been reported in the literature; women performed better on a test of political knowledge when the test administrator was female as opposed to male (McGlone et al., 2006), and Black participants performed better on a verbal intelligence test when the test administrator was Black as opposed to White (Marx & Goff, 2005). Collectively these studies suggest that the presence

of stereotype-disconfirming in-group role models within the test environment acts to buffer stereotyped targets from the adverse effects of stereotype threat.

Following from the success of the aforementioned role model intervention techniques, two recent studies investigated the effect of Barak Obama's status as an intelligent and successful African American role-model on the academic performance of African American students. Employing a large national sample, Marx, Ko, and Friedman (2009) had Black and White participants complete a difficult, diagnostic verbal exam at four predetermined points during Obama's Presidential campaign and election. Results showed that Obama had a positive role model effect on the test performance of Black Americans, such that Black and White participants performed equally well on the test, albeit only at times when Obama's stereotype-defying accomplishments were "concrete and salient" (p. 954). Marx et al. (2009) concluded that Obama's achievements as a role-model acted as a shield for Black participants against stereotype threat. However, Aronson, Jannone, McGlone, and Johnson-Campbell (2009) failed to replicate the "Obama effect" in an experimental study, suggesting that some Black Americans may have viewed Obama's extraordinary success as unattainable. Therefore, while some evidence suggests that positive, stereotype-disconfirming role-models can reduce performance decrements under stereotype threat, further research is needed to explore the boundaries of this effect.

2.3.3. De-emphasising threatened social identities. In addition to interventions which change the stereotype threatened individual's perception of the test situation and those which manipulate their attitude towards the stereotype, a third category of research has explored methods which aim to reduce susceptibility to stereotype threat and engender good performance outcomes by de-emphasising threatened social identities. Such interventions are founded on the principle that stereotype threat will only disrupt performance if the

stereotyped identity is salient during the test situation. In support of this theory, Ambady, Paik, Steele, Owen-Smith, and Mitchell (2004) found that women who adopted a more differentiated self-view after actively considering unique aspects of their personal identity (both positive and negative self-traits) were less at risk of stereotype threat. Emphasising the individual as opposed to the group identity via the disclosure of personal information is termed *individuation*, and provides distance from the stereotype, reducing the salience of the threatened group identity and protecting against group stereotype activation and poor performance.

The success of individuation in reducing stereotype threat effects is promising; however, individuals often possess multiple self-relevant group identities, each of which may be associated with a different ability-related stereotype within a single performance domain (Shih, Pittinsky, & Ambady, 1999). Exploring the implications of this, Shih et al. (1999) had Asian American women complete a maths test after responding to a survey designed to highlight their Asian identity (positively stereotyped), female identity (negatively stereotyped), or neither (control). Findings showed an improvement in maths performance relative to the control group when their Asian identity was accessible, but underperformance compared to the control group when their female identity was salient. This suggested that stereotyped group identity salience may be reduced, and stereotype threat effects attenuated, by highlighting a positive in-group identity. Similarly, Rydell, McConnell, and Beilock (2009) found that female undergraduates who completed a maths test after receiving both positive college student-related and negative gender-related information showed no evidence of stereotype threat effects, in that they performed just as well as female undergraduates who received no information about social identities. The authors suggested that female participants with multiple identities activated may have adopted the identity which allowed

them to maintain a positive view of themselves (student) rather than the identity which maintained a negative view (female). This idea received further support in a recent study by Rydell and Boucher (2010).

Interventions which employ techniques such as individuation or promoting a positive group identity appear to reduce susceptibility to stereotype threat by overshadowing the threatened social identity. Similar to this line of research is work by Rosenthal and colleagues (Rosenthal & Crisp, 2006; Rosenthal et al., 2007), who succeeded in decreasing stereotype threat effects by reducing the boundaries between a negatively stereotyped in-group and a positively stereotyped out-group. Rosenthal and Crisp (2006) hypothesised that an individual would not be able to conform to a self-relevant stereotype based on expected performance differences between an in-group and an out-group if the psychological distinction between the two groups was blurred. In line with this hypothesis, female participants who completed an overlapping characteristics task requiring them to list characteristics shared by men (out-group) and women (in-group) prior to receiving a stereotype threat manipulation performed significantly better on a maths test than non-intervention control participants. That the intervention task was most successful when placed before (versus after) an explicit threat manipulation suggests that reducing intergroup bias may prevent stereotype threat from emerging in vulnerable individuals. Interestingly, a later study found that increasing the relevance of the overlapping-characteristics task to the threatened domain increased the efficacy of the manipulation (Rosenthal et al., 2007).

2.4 Perspective-Taking and Reducing Stereotype Threat

The success of the intervention methods outlined above in reducing performance deficits characteristic of stereotype threat demonstrates that the *threat in the air* can be alleviated by several means. The third study presented in this thesis aimed to build on this

existing knowledge and test a potential stereotype threat intervention strategy drawing on the perspective-taking literature, which suggests that perspective-taking can result in perspective-takers behaving in line with the target as a consequence of increased self-other overlap at the level of cognitive representation. In keeping with the majority of stereotype threat research, and with the first two studies presented in this thesis, Experiment 3 focused on the stereotype that women are poor at maths. When women (negatively stereotyped group members) are reminded of the negative stereotype about their group, they can underperform on a maths test (stereotype threat). However, instructing these female participants to take the perspective of a man (positively stereotyped group member) may be a way to reduce this threat. Specifically, following Galinsky et al.'s (2005) model, taking the perspective of an other should result in behaviour in line with that other, so that threatened women will take the perspective of a man and therefore behave in line with the positive male stereotype and improve their performance.

Parallels can be drawn between the idea of reducing stereotype threat using perspective-taking and the logic behind intervention strategies which de-emphasise threatened social identities. Specifically, female participants taking the perspective of a male target were expected to experience self-other overlap, such that positive stereotype-relevant characteristics belonging to the male target were increasingly applied to the self-concept of the female perspective-taker. Correspondingly, the female perspective-taker should become more male-like as the male identity becomes self-relevant, potentially decreasing the salience of the female identity and reducing susceptibility to stereotype threat effects. Encouraging stereotype threatened group members to distance themselves from the stereotype through individuation (Ambady et al., 2004), and activating positive self-relevant in-group identities (Shih et al., 1999) similarly encouraged the reduction of stereotype threat by reducing the

salience of the negative in-group identity. Furthermore, the findings of Rydell et al. (2009) (i.e., when multiple self-relevant identities are available, the identity resulting in a positive self-view is adopted) are encouraging in terms of the current research. Specifically, perspective-taking induced self-other overlap is argued to make the stereotype self-relevant (Marx & Stapel, 2006); therefore, female perspective-takers may draw upon the positive aspects of the male stereotype which are included in their self-representation and adopt a more positive self-view.

The perspective-taking intervention task employed in Experiment 3 was presented prior to the explicit threat manipulation in order to *buffer* against the negative effects of stereotype threat (in line with the findings of Rosenthal & Crisp, 2006). The stereotype threat manipulation used in Experiment 3 consisted of two conditions (based on successful threat manipulations used in the stereotype threat literature); one designed to create a stereotype threat situation for female participants (threat) and one designed to reduce the ambient level of stereotype threat (no-threat). It was predicted that female participants in the threat condition who take the perspective of the male target (by writing about the target from the first-person perspective) would perform better on the maths test than stereotype threatened female participants who did not perspective-take (i.e., those in the objective condition). Male participant's maths scores were not expected to vary between the two perspective conditions as all male participants were presented with a target of the same-gender group membership. Also, it was predicted that the scores of male participants should not vary between the two stereotype threat conditions (threat vs. no-threat), since men are positively stereotyped in this context and therefore are not vulnerable to stereotype threat.

2.5 Current Research Summary

The role of perspective taking in reducing stereotype threat was the main focus of Experiment 3. Prior to this, Experiment 1 focused on the idea that perspective-taking can lead perspective-takers to demonstrate behaviours characteristic of the target of perspective-taking. More specifically, Experiment 1 explored the effects of perspective-taking on behaviour when the perspective-taker belongs to a negatively stereotyped group while the target is from a positively stereotyped group. Experiment 2 expanded this line of research further by adjusting the perspective-taking method and providing participants with a photograph which strengthens the target's stereotyped group membership using visual cues. Finally, Experiment 3 examined the effect of perspective taking on behaviour following an explicit stereotype threat manipulation.

Chapter 3: The Effect of a Positive vs. Negative Target on Behaviour of Perspective-Takers

Experiment 1 aimed to explore the effect of perspective-taking on behaviour by examining performance when the target of perspective-taking was either positively or negatively stereotyped, and the participant was either positively or negatively stereotyped. In line with perspective-taking theorising it was expected that, on taking the perspective of the target, self-other merging would occur, such that the characteristics of self and target-other become increasingly similar at the level of mental representation, and the participant becomes more target-like and vice versa (Davies et al., 1996; Galinsky et al., 2005). The perspective-taking literature has shown that self-other overlap following perspective-taking can result in the perspective-taker demonstrating stereotype-consistent behaviours (e.g., Galinsky et al., 2008; Marx & Stapel, 2006). Marx and Stapel (2006) found that positively stereotyped participants who took the perspective of a negatively stereotyped target underperformed on a stereotype-relevant test compared to non-perspective-takers, concluding that perspective-taking makes the target stereotype self-relevant. Based on these findings, it seems reasonable to suggest that negatively stereotyped participants who take the perspective of a positively stereotyped target will outperform negatively stereotyped non-perspective-takers.

Experiment 1 was based on the methodology of Marx and Stapel (2006). Specifically, writing a short essay about a day in the life of the stereotyped target from the *first-person* perspective was used to induce perspective-taking in participants, while writing about the target from a *third-person* perspective established a non-perspective-taking control group. However, there were a number of changes to the manipulation employed by Marx and Stapel (2006). First, a maths test rather than an emotional sensitivity test was used, meaning

that women were negatively stereotyped and men were positively stereotyped within the test domain (the opposite to the emotion stereotype used by Marx & Stapel, 2006). Second, alongside a negatively stereotyped target (female), a positively stereotyped target (male) was also used. This allowed for a comparison of the effects of perspective-taking on behaviour when the target was positively versus negatively stereotyped. Finally, participants in the current study were presented with a photograph of the (male/female) target, to aid perspective-taking. Although Marx and Stapel (2006) did not include a photograph of the target, this feature is often employed in similar perspective-taking manipulations (e.g., Galinsky & Ku, 2004; Galinsky & Moskowitz, 2000; Galinsky et al., 2008; Macrae et al., 1994).

In line with Marx and Stapel (2006), it was expected that female participants presented with a female target (negatively stereotyped) would underperform on the maths test compared to male participants regardless of perspective-taking condition, as women are already negatively stereotyped in this domain.

However, when the target is male (positively stereotyped), it was expected that female participants in the first-person perspective condition would 'become' more male-like and perform better on the maths test than female participants in the third-person condition – consistent with the stereotype that men are good at maths.

The female (negatively stereotyped) target and male (positively stereotyped) target should have the opposite effect on the performance of male participants to that of female participants. Therefore, male participants who wrote about a female target in the first-person perspective were expected to underperform on the maths test compared to male participants in the third-person condition, as a result of the negative female stereotype (poor at maths) becoming self-relevant in the first-person condition.

Finally, it was expected that male participants (already positively stereotyped) presented with a male target would perform equally well regardless of perspective-taking condition.

3.1 Experiment 1

3.1.1 Method

Participants and Design

Participants were 199 male (n = 65) and female (n = 132) AS-/A-Level students aged 16-18 (M = 16.99, SD = 0.53), from two school sixth-forms in the UK (two participants did not record their gender and three failed to record their age). All were of British nationality. Participants were randomly assigned to one of two Perspective conditions (first-person perspective vs. third-person perspective) and one of two Target Gender conditions (male vs. female).

Procedure

Participants were tested in mixed-gender groups of 15-20 students, with each participant seated at a separate desk in order to replicate the testing conditions of a standardised exam. Following consent, the female experimenter verbally instructed participants to behave in accordance with exam conditions (i.e., no talking or conferring), and distributed printed booklets which comprised the experimental materials. The booklets were shuffled before distribution to ensure random assignment of participants to each experimental condition. Information on the cover sheet informed participants that 20 minutes were allocated in total for three separate tasks, and that they would receive verbal instruction from the experimenter regarding when to start and finish each section. They

were asked to refrain from leafing through the booklet, and to turn through the sections only when instructed by the experimenter.

Materials

Perspective / target gender manipulation. Participants were presented with a black-and-white photograph of either a male or female 17 year-old student (Target Gender) and instructed to write about a day in the life of that student from either a first-person perspective (I) or a third-person perspective (He/She). The perspective-taking procedure was taken from Marx and Stapel (2006), although it differed in that both a male and female target were used. Participants in the perspective-taking (first-person perspective) condition received the following instructions (printed below the photograph):

This is [Paul/Paula]. [He/She] is 17 years old and is currently studying for [his/her] A-Levels at college. Please write a short passage about a typical day in [Paul's/Paula's] life, using the first-person perspective (i.e., "I wake up and…")

Participants in the control (third-person perspective) condition received the following instructions:

This is [Paul/Paula]. [He/She] is 17 years old and is currently studying for [his/her] A-Levels at college. Please write a short passage about a typical day in [Paul's/Paula's] life, using the third-person perspective (i.e., "[He/She] wakes up and…")

Below the instructions were 13 lines on which participants constructed their narrative passage. Participants were verbally informed that they had five minutes in which to complete the exercise.

Maths test. The second section of the study comprised a 30-item mathematics test (taken from Rosenthal et al., 2007) consisting of straightforward mental arithmetic questions; for example, *"In a group of 21 people, 2/7 were wearing jeans. How many people were*

wearing jeans?". Participants received written and verbal instruction to complete as many of the maths problems as they could within ten minutes, without the aid of a calculator.

Demographic information. Participants were asked a number of demographic questions, including their age and nationality. There was no time limit for this final section. The experimental materials for Experiment 1 can be found in Appendix A.

3.1.2 Results

Twenty participants were excluded from the following analyses due to failure to complete all relevant information (n = 4); late arrival (n = 1); or requiring exam concession – a condition we could not meet (n = 15).

Maths Performance

Maths performance was calculated as the number of items correct, with a maximum score of 30 (minimum = 0). A 2 (Participant Gender: male vs. female) x 2 (Target Gender: male vs. female) x 2 (Perspective: first-person vs. third-person) ANOVA was calculated for maths performance.

A main effect of Participant Gender was found, $F(1, 171) = 8.229$, $p = .005$, with male participants (M = 12.98, SD = 5.41, n = 59) performing significantly better than female participants (M = 10.31, SD = 5.02, n = 120), in line with the stereotype that men are better than women at mathematical problem solving. There was no main effect of Target Gender, $F(1,171) = 1.023$, $p = .313$, therefore there was no significant difference between the maths performance of participants who wrote a narrative essay about a male target (M = 11.65, SD = 5.33, n = 88) and those who wrote about a female target (M = 10.75, SD = 5.24, n = 91). Additionally, there was no main effect of Perspective, $F(1, 171) = 1.267$, $p = .262$, therefore

there was no significant difference between participants writing in the third-person (M = 10.75, SD = 4.39, n = 89) and first-person (M = 10.75, SD = 4.39, n = 89).

Each of the three two-way interactions were non-significant; the first between Target Gender and Perspective, $F(1, 171) = 2.157$, $p = .144$, the second between Target Gender and Participant Gender, $F(1, 171) = 1.370$, $p = .243$, and the third between Perspective and Participant Gender, $F(1, 171) = 1.516$, $p = .220$. However, the analysis did reveal a significant three-way interaction between Target Gender, Participant Gender and Perspective, $F(1, 171) = 3.952$, $p = .048$. To examine the three-way interaction, further ANOVAs were carried out to analyse the effects of Target Gender and Perspective on maths performance separately within each Participant Gender.

Male participants. A 2 (Target Gender) x 2 (Perspective) ANOVA was conducted on the maths performance of male participants. Examining the maths performance of male participants revealed no main effect of Target Gender, $F(1, 55) = 0.009$, $p = .926$, so there was no significant difference between men who wrote about a day in the life of a male target (M = 12.55, SD = 4.64, n = 29) and men who wrote about a day in the life of a female target (M = 13.40, SD = 6.11, n = 30). Likewise, there was no main effect of Perspective, $F(1, 55) = 1.916$, $p = .172$, therefore there was no difference between male participants in the third-person (M = 11.78, SD = 4.76, n = 23) compared to the first-person condition (M = 13.75, SD = 5.71, n = 36). However, the analysis revealed a significant Target Gender x Perspective interaction, $F(1,55) = 4.121$, $p = .047$. T-tests decomposed this two-way interaction further.

Target gender. First, the effect of Perspective on maths score was examined independently for each Target Gender condition. No significant difference was found between male participants who wrote about a male target from the first-person (M = 12.18, SD = 5.11, n = 17) and third-person (M = 13.08, SD = 4.03, n = 12) perspective, $t(27)$ =

0.511, p = .613. However, male participants who wrote about a female target from a first-person perspective scored significantly higher on the maths test (M = 15.16, SD = 5.98, n = 19) than male participants who wrote about a female target from a third-person perspective (M = 10.36, SD = 5.26, n = 11), $t(28)$ = -2.206, p = .036.

Perspective. Second, the effect of Target Gender was examined independently for each Perspective condition. The analysis revealed no significant difference between male participants in the third-person condition who wrote about a male target (M = 13.08, SD = 4.03, n = 12) and those who wrote about a female target (M = 10.36, SD = 5.26 n = 11), $t(21)$ = 1.399, p = .176. Similarly, there was no difference between male participants in the first-person condition who wrote about a male target (M = 12.18, SD = 5.11, n = 17) and those who wrote about a female target (M = 15.16, SD = 5.98, n = 19), $t(34)$ = -1.597, p = .119.

Therefore, further analyses of the significant two-way interaction between Target Gender and Perspective for the maths scores of male participants appears to show that the main difference lies between male participants who wrote about a day in the life of a female target from a first-person compared to a third-person perspective (see Figure 1), with the former performing better on the maths test than the latter.

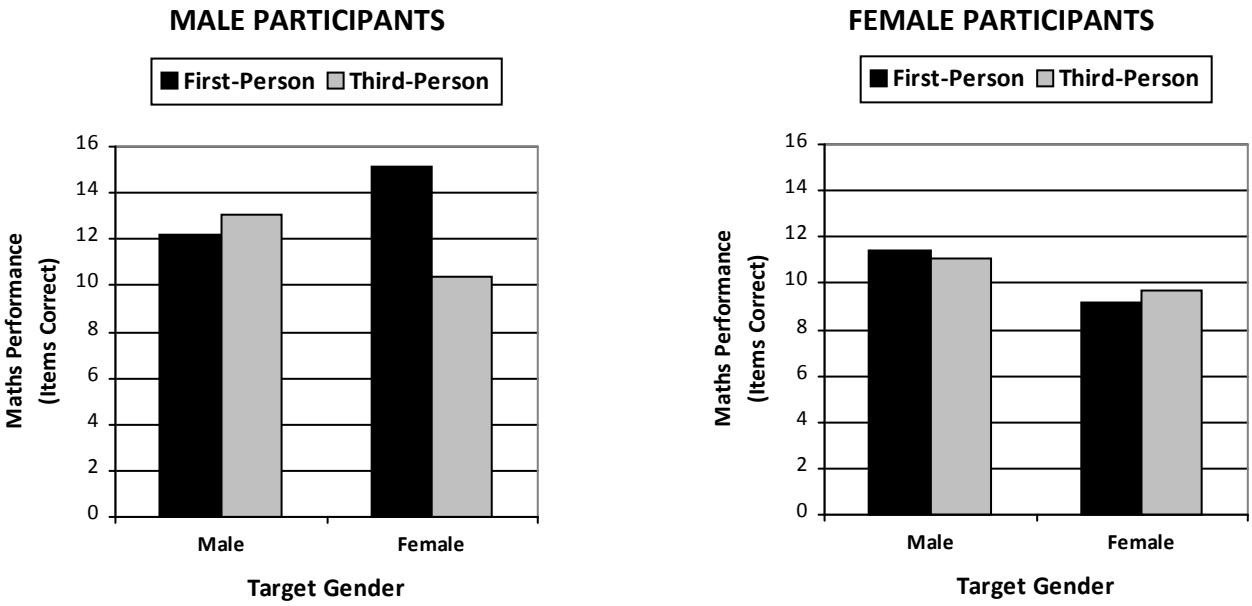


Figure 1. Maths test performance of male participants (left) and female participants (right) when instructed to write about a male or female target from either the first-person or third-person perspective.

Female participants. Examining the maths performance of female participants, a marginally significant main effect of Target Gender was found, $F(1, 116) = 3.830$, $p = .053$. Mean maths scores showed that female participants who wrote about a day in the life of a male target scored higher on the maths test ($M = 11.20$, $SD = 5.63$, $n = 59$) than female participants who wrote about a day in the life of a female target ($M = 9.44$, $SD = 4.23$, $n = 61$). However, there was no main effect of Perspective; there was no significant difference between female participants in the third-person perspective ($M = 10.39$, $SD = 4.23$, $n = 66$) and first-person perspective ($M = 10.20$, $SD = 5.89$, $n = 54$) conditions. The two-way interaction between Target Gender and Perspective was also non-significant $F(1,116) = 0.217$, $p = .642$. This suggests that, regardless of perspective-taking condition, female

participants who wrote about a male target scored higher on the maths test than female participants who wrote about a female target.

3.1.3 Discussion

The aim of Experiment 1 was to expand the findings of Marx and Stapel (2006) to examine the effect of perspective-taking when the target was from a positively stereotyped group. It was expected that when the target was a woman (negatively stereotyped), female participants would underperform on the maths test compared to men regardless of perspective-taking condition (in line with Marx & Stapel, 2006). This was supported, with male students performing better than female students. However, for men it was expected that they would underperform in the first-person compared to the third-person perspective condition when presented with a female target (also in line with Marx & Stapel, 2006), with the idea that they would merge the other into the self and effectively become targets of the negative stereotype (i.e., the stereotype would become self-relevant for the perspective-taker). This finding of Marx and Stapel (2006) was not supported – male participants writing about a female target performed better in the first-person than the third-person condition; the opposite to the finding of Marx and Stapel (2006).

For the male target (positively stereotyped), it was expected that self-other merging would also occur, in line with Galinsky et al.'s (2005) model, so that female participants would improve their performance after effectively becoming a target of the positive male stereotype. However, this finding was not observed; regardless of perspective or participant gender there was no significant difference between participants when writing about a male target.

The current findings cast doubt on previous research which suggests that taking the perspective of a negatively stereotyped target results in underperformance in line with that negative stereotype. Specifically, Marx and Stapel (2006) found that female participants (positively stereotyped in the domain of emotional sensitivity) performed worse on an emotion test after writing about a day in the life of a male target (negatively stereotyped) from a first-person perspective, relative to female participants who wrote about the target from a third-person perspective. Marx and Stapel (2006) argued that writing from a first-person perspective (i.e., perspective-taking) made the negative stereotype self-relevant, resulting in stereotype-consistent behaviour (poor performance). However, the finding of Experiment 1 that men who wrote about a female target (negatively stereotyped) from the first-person perspective outperformed men in the third-person perspective condition directly contradicts the findings of Marx and Stapel (2006).

In order to further explore the discrepancy between the current findings (i.e., perspective-taking does *not* lead to behaviour consistent with the target stereotype on a domain relevant task) and that of Marx and Stapel (2006) and the wider perspective-taking literature (e.g., Galinsky et al., 2005; 2008), Experiment 2 focused on exploring the male target condition further. That is, the second experiment conceptually replicated Experiment 1, with a specific focus on the behaviour of female participants (negatively stereotyped) taking the perspective of a male target (positively stereotyped). In addition, modifications made to the perspective-taking manipulation in Experiment 2 aimed to further differentiate the perspective-taking and control conditions, and increase the stereotypicality of the target.

Chapter 4: The Effect of Perspective-Taking on Women's Maths Performance when the Target is a Stereotypical Maths Student

In order to extend the findings of Experiment 1, Experiment 2 focused on exploring the male target condition further. Specifically, Experiment 2 aimed to examine the findings of the male target condition for female participants (negatively stereotyped group), with different perspective-taking conditions and a more stereotypical male target.

Experiment 1 found that female participants performed better on a maths test when presented with a male target rather than a female target, regardless of perspective-taking (i.e., first-person or third-person) condition. However, it has been argued that considering a target from *either* the first-person *or* the third-person can be seen as taking the perspective of the target (Batson, Early et al., 1997). According to this view, it is possible that participants in Experiment 1 who wrote about the target in the first-person imagined how they *personally* would feel in the target's situation, while those in the third-person condition imagined how the *target* felt; both groups, effectively, perspective-taking. This may partly explain the discrepancy between the findings of Experiment 1 (i.e., considering a positively stereotyped target from the first-person perspective did not improve participants' performance, and similarly, when the target was negatively stereotyped did not harm performance), and previous perspective-taking research and theorising which suggests that perspective-taking leads to behaviour consistent with the stereotyped target (e.g., Galinsky et al., 2005). That is, the third-person perspective condition used in Experiment 1 may not have been a strong enough control for perspective-taking (first-person perspective condition). Therefore, a different control condition was used in Experiment 2.

Perspective-taking has been explored using different methods. Experiment 1 employed the method of Marx and Stapel (2006) in creating a first-person and third-person

perspective condition. However, a number of different perspective-taking manipulations exist within the literature. The majority encourage perspective-taking by instructing participants to consider the target from the first-person perspective, imagining how they, personally, would feel after spending a day in the target's shoes (e.g., Batson, Early et al., 1997; Davis et al., 1996; Galinsky & Ku, 2004; Galinsky & Moskowitz, 2000; Galinsky et al., 2008; Goldstein & Cialdini, 2007). In contrast, researchers have differed markedly in their approach to perspective-taking control conditions. While some have simply presented an image or description of the target with no further instructions (e.g., Galinsky & Ku, 2004; Galinsky & Moskowitz, 2000; Goldstein & Cialdini, 2007), others have attempted to suppress participants' tendency to consider the target's stereotypical features (e.g., Galinsky & Moskowitz, 2000; Galinsky et al., 2008). Another method involves instructing the participant to consider the target *objectively* by taking a neutral perspective, detached from thoughts about what the target has been through or what they might feel. Designed to inhibit perspective-taking, this manipulation has been used successfully as a perspective-taking control condition by Batson, Early et al. (1997) and Galinsky et al. (2008). Therefore, Experiment 2 included an objective condition, rather than a third-person condition.

In addition, the male target in Experiment 2 was presented as a stereotypical maths student, rather than simply as a college student (Experiment 1). This was also in line with previous perspective-taking studies that have tended to use a typical exemplar, whereby the target stereotype is visually emphasised and immediately distinguishable. For example, photos have been used of a skinhead (Macrae et al., 1994), an elderly man (Galinsky & Moskowitz, 2000), a cheerleader replete with pom-poms (Galinsky et al., 2008, Experiment 1A), a university professor (Galinsky et al., 2008, Experiment 1B) and an African-American man (Galinsky et al., 2008, Experiment 1D). The current research aimed to explore the

effect of perspective-taking on the behaviour of negatively stereotyped group members (women) when the target was positively stereotyped (a man). For the target's positive stereotypical characteristics to be correctly perceived by the perspective-taker, and applied to their self-concept via self-other overlap, those characteristics should be visibly recognisable. Therefore, the male target in Experiment 2 was photographed in front of a Mathematical Sciences university sign, carrying a calculus textbook, to increase the maths-specific contextual cues. In addition, the target was described as an undergraduate student studying maths.

In contrast to Experiment 1, in which male and female participants were tested, Experiment 2 concentrated on female participants only. The first reason for this was to build on and further explore the findings of Experiment 1 by examining the potentially positive effects of perspective-taking for a negatively stereotyped group; this is particularly important, as it has not been addressed in previous literature. The second reason for focusing on female participants concerns the second aim behind the experiments presented in this thesis, which was to develop an intervention method for stereotype threat (addressed in Experiment 3). Women (but not men) contend with a negative stereotype in the domain of maths, leaving them vulnerable to stereotype threat effects in situations where their maths ability is examined (such as in the current experiments); the stereotype threat is "in the air" (Steele, 1997, p. 614). Therefore, the effect of perspective-taking on the performance of women on the maths test is of particular interest here.

It was hypothesised that female participants would perform better in the first-person condition than the objective condition, consistent with the target stereotype (in line with the theorising of Galinsky et al., 2005).

4.1 Experiment 2

4.1.1 Method

Participants and Design

Participants were 30 female students from Durham University aged 18-22 (M = 19.24; SD = 1.09) who were run individually and received 30 minutes course credit or £3.00 for their participation. Participants were assigned to one of two Perspective conditions (first-person vs. objective).

Procedure

On arrival, participants gave consent before being informed that the experiment consisted of a number of written tasks related to social psychology, each of which had a time limit that would be made clear to them by the experimenter.

Materials

Perspective-taking manipulation. Participants were presented with a black-and-white photograph of a young male holding a calculus textbook, standing next to a Mathematical Sciences university sign, with the description: *This is Paul. He is 20 years old, and is currently studying maths at university*. Participants in the first-person condition received the written instructions:

Please take Paul's perspective. Clearly visualise what it would be like to be Paul and imagine a typical day in his life, looking at the world through his eyes and walking through the world in his shoes. Now write a short passage about a day in Paul's life as if you were Paul going through his day, using the first-person perspective (i.e. "I wake up and...").

Participants in the objective condition received the written instructions (adapted from Batson, Early et al., 1997):

Please write a short passage about a typical day in Paul's life. Do not to concern yourself with how this person feels and what he may have been through, instead, remain detached and unemotional. Try to take a neutral perspective, and be as objective in your description as possible.

As in Study 1, participants were given a lined area in which to write their passage, and were verbally informed that they had five minutes to complete the task.

Maths test. Following the perspective-taking manipulation all participants completed a nine-item mathematics test (extract from: AQA GCSE Higher-Tier Mathematics 4302, Specification B, March 2009). All questions were open-ended, and some had multiple-parts. There was a maximum score of 15. Participants were told to complete as many of the problems as they could within ten minutes without the aid of a calculator, and asked to show their working-out on the question paper.

Demographic questions. Following the maths test, participants were asked to provide some demographic information, including their age and nationality. At the end of the experiment, participants were fully debriefed and thanked for their participation. The experimental materials for Experiment 2 can be found in Appendix B.

4.1.2 Results

Maths Performance

Maths performance was calculated as the number of correct answers. An independent t-test was calculated to examine the maths performance of participants in the first-person and objective conditions, revealing a significant difference between the two conditions, $t(28) = -2.555$, $p = .016$. Female participants who wrote about a male target from an objective standpoint answered more maths questions correctly ($M = 7.47$, $SD = 2.10$, $n =$

15) than female participants who wrote about a male target from a first-person perspective (M = 5.73, SD = 1.58, n = 15).

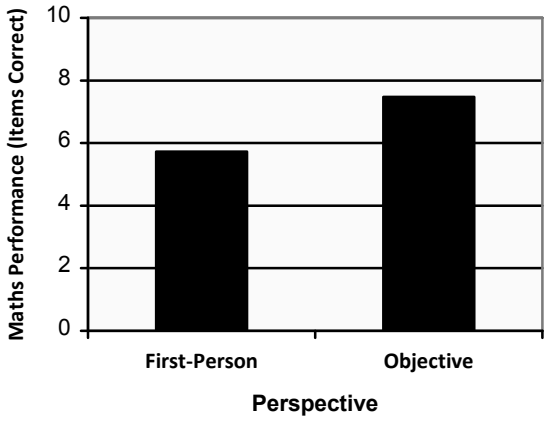


Figure 2. Maths performance for female participants presented with a male target in the first-person and objective conditions.

4.1.3 Discussion

The aim of Experiment 2 was to examine the effect of taking the first-person or objective perspective of a typical male maths student (positively stereotyped) on female participants' maths performance. Results showed that female participants in the objective condition performed better on the maths test than female participants in the first-person condition. This finding is counter to Galinsky et al. (2008), who suggested that perspective-taking leads to more stereotype-consistent behaviour, and demonstrated this effect across a series of investigations using a range of different stereotypes. In addition, the findings of Experiment 2 are counter to the predictions of Galinsky et al.'s (2005) model, which suggests that the increased application of target-representations to the self-concept following perspective-taking should result in the self becoming more target-like (i.e., the female

perspective-taker becoming more male-like), and behaving in line with the male target stereotype. However, as Galinsky et al. (2005; 2008) did not examine participants from negatively stereotyped group memberships, this finding offers an important contribution to the literature. Specifically, it appears that when the target is positively stereotyped and the participant is negatively stereotyped, perspective-taking does not lead to behaviour consistent with the target stereotype (at least for women and maths). As mentioned previously, this is inconsistent with expectations based on the theorising of Galinsky et al. (2005). One explanation for the current findings may be that the male target used in Experiments 1 and 2 was an *exemplar* (i.e., an individual representing a typical member of the stereotyped group), rather than simply an abstract stereotypical construct.

Galinsky et al. (2005) do not consider the implications of priming participants with an exemplar versus an abstract stereotype; however, research from the prime-to-behaviour literature has demonstrated that while priming participants with an abstract stereotype leads to behavioural assimilation (i.e., behaviour in line with the target stereotype), priming with a discrete exemplar leads to behavioural contrast effects, that is, behaviour opposite to the target stereotype (Dijksterhuis, Spears et al., 1998). Behavioural contrast is argued to occur as the result of a spontaneous social comparison between perceiver and exemplar, which overrides the tendency towards assimilation of the activated (primed) stereotype construct. Therefore, it is possible that the manner in which the target stereotype is presented (exemplar), in addition to the perspective-taker being from a different group to the target, has an effect on the behavioural outcomes of perspective-taking (behavioural contrast rather than assimilation).

One drawback to Experiment 2 was the lack of a male (positively stereotyped) comparison group. While the intention of Experiment 2 was to further explore the effect of

perspective-taking on the performance of the negatively stereotyped group (women), it would be interesting to examine the conditions of Experiment 2 (i.e., first-person perspective versus objective) with a positively stereotyped comparison group. Therefore, Experiment 3 sought to examine the behaviour of both a negatively (women) and positively (men) stereotyped group following perspective-taking, while additionally examining the role of stereotype threat. As discussed in Chapter 2, it was initially considered possible that perspective-taking could act as an additional intervention for reducing stereotype threat. However, the findings of Experiments 1 and 2 suggest that perspective-taking actually has a negative impact on the performance of a negatively stereotyped group. Therefore, it was felt that, in line with the theorising in Chapter 2, stereotype threat situations could be overcome by taking the perspective of a positively stereotyped group member. However, in line with the findings from Experiments 1 and 2, it was felt that it would be unlikely that typical stereotype threat situations would be overcome by the introduction of a perspective-taking condition. Experiment 3 explored this further.

Chapter 5: Can Perspective-Taking Reduce Stereotype Threat?

Experiment 3 examined perspective-taking as an intervention technique for reducing stereotype threat. As discussed in Chapter 2, stereotype threat is a social-psychological threat which has the potential to affect any individual who finds themselves in a situation where they risk conforming to, or being judged in terms of, the devaluing stereotype associated with their group membership (Steele, 1997). Conceptually, stereotype threat is a situational "threat in the air" (Steele, 1997, p. 614); therefore, it should be experienced in situations where the negative stereotype is relevant and salient (Steele, 1997; Spencer et al., 1999). From this distinctive feature of stereotype threat derives the implication that, by removing the stereotypic expectation from the testing environment, stereotype threat effects should be attenuated or eliminated altogether. Therefore, recent work has moved beyond demonstrating the existence of stereotype threat to exploring various intervention methods which aim to improve the performance of negatively stereotyped group members on domain-relevant tasks.

Previous methods have successfully reduced stereotype threat by, for example, modifying the presentation of the task so that the negative group stereotype is rendered irrelevant (e.g., Spencer et al., 1999), or shaping the beliefs of vulnerable group members toward the stereotype (e.g., Aronson et al., 2002). In addition, a number of successful interventions have focused on de-emphasising threatened social identities (Ambady et al., 2004; Rydell et al., 2009; Shih et al., 1999), on the basis that stereotype threat will only disrupt performance if the stereotyped identity is salient during the test situation. This idea is similar to the idea explored in this thesis of reducing stereotype threat using perspective-taking. Specifically, the self-other overlap mechanism believed to underlie perspective-taking should increase the application of target trait representations to the self-concept, resulting in

a more other-like conception of self (Galinsky et al., 2005). Correspondingly, the perspective-taker may become more removed from the negatively stereotyped group identity and less vulnerable to stereotype threat. Furthermore, there is evidence to suggest that perspective-taking leads the perspective-taker to demonstrate behaviours consistent with the target stereotype (Galinsky et al., 2008; Marx & Stapel, 2006). Therefore, it was considered likely that perspective-taking (using a positively stereotyped target) could be a useful method for reducing stereotype threat; if this is the case, then the performance of women in the first-person condition should not differ significantly from that of men, in line with previous stereotype threat intervention research (e.g., Johns et al., 2005; Martens, Johns, Greenberg, & Schimel, 2006; Marx & Roman, 2002).

However, the experiments presented so far in this thesis suggest that perspective-taking may not have the positive consequences as was hoped; Experiment 1 predicted that female participants who took the perspective of a male (positively stereotyped) target would perform better on the maths test than female participants in the third-person condition; however, while women performed better when the target of perspective-taking was male, compared to female, there was no significant performance difference between the first-person and third-person conditions. Additionally, in spite of a more stringent perspective-taking control condition, Experiment 2 saw female participants *underperform* in the first-person perspective compared to the objective control condition. Therefore, perspective-taking may not be an effective method for reducing stereotype threat. Experiment 3 sought to examine these two conflicting suppositions further.

The basic paradigm used to manipulate stereotype threat involves randomly allocating stereotyped group members to either a stereotype threat or a control condition. The mean performance of the two groups on a stereotype-relevant task can then be

compared. Studies also often include non-stereotyped individuals as a comparison group (e.g., if the focus was on the stereotype that women are poor at maths then the comparison group would include men, who are not targeted by a negative stereotype in this domain). The threat condition usually comprises information or cues designed to activate the negative stereotype, while the control condition is designed to nullify the relevance of the stereotype to the test situation (within the literature, the stereotype threat control condition is sometimes referred to as the reduced-threat condition, depending on the method used). Within the stereotype threat literature there are numerous variations on this basic design, with threat and threat-removal manipulations ranging from subtle to explicit (Nguyen & Ryan, 2008).

In order to create a typical stereotype threat manipulation, Experiment 3 had two conditions based on previous research (threat versus no-threat). The threat condition was designed to increase the relevance of the stereotype to the test situation, and was based on instructions employed in previous studies (e.g., Johns et al., 2005; Keller, 2007; Keller & Dauenheimer, 2003). Participants were informed that the maths test they were about to take was designed to investigate individual differences in maths ability, and had produced gender differences in the past such that the average achievement of men was different to that of women. In their review of stereotype threat effects, Nguyen and Ryan (2008) categorise this type of threat cue as *moderately explicit*, as it conveys a message of group differences without identifying the direction of those differences. One advantage of employing a moderately explicit threat cue as opposed to an explicit cue (e.g., stating a subgroups' inferiority in the test domain) is the reduced likelihood of inducing *stereotype reactance*: the improved performance of stereotyped individuals which can occur following an explicit threat to their ability to perform (Kray et al., 2001).

The no-threat condition in Experiment 3 was employed as a control for stereotype threat effects. Stereotype threat-control or removal strategies are designed to render the negative stereotype less relevant to the test situation, such that the stereotype is not activated and stereotype threat is not experienced by participants (Kit et al., 2008). Past research has successfully controlled for stereotype threat using methods which are implicit (e.g., framing a test as non-diagnostic of ability) or explicit (e.g., stating that there are no recorded performance differences between the ingroup and outgroup on a test). A recent meta-analysis found *explicit* threat removal cues to be more effective than subtle cues in reducing stereotype threat effects in women (Nguyen & Ryan, 2008); therefore, an explicit cue (based on the design of Brown & Pinel, 2003) was used for the no-threat condition in Experiment 3. Specifically, participants were informed that the test investigated cognitive processing ability, and had not been shown to produce gender differences in past research (i.e., men = women).

Based on the hypothesis that perspective-taking could be used as a stereotype threat intervention, women were predicted to perform better in the first-person perspective condition than the objective condition following stereotype threat. In addition, in line with the theorising of Galinsky et al. (2005), when no threat was present women were also predicted to perform better in the first-person compared to the objective condition, consistent with the male target stereotype (good at maths). For men, who do not contend with a negative stereotype in the test domain, it was not expected that there would be any performance difference between the threat and no-threat conditions. Furthermore, as the target of perspective-taking was male (same group membership), no performance difference was expected between men in the first-person and objective groups.

However, alternative hypotheses were formulated based on the findings from Experiment 2. Due to the finding that women underperformed in the first-person condition relative to the objective condition, it was hypothesised that the same pattern would be observed under stereotype threat in Experiment 3. That is, the first-person perspective condition was predicted to heighten the stereotype, leading to underperformance. Conversely, in the no-threat condition, it was thought that suggesting that the maths test did not show gender differences would stop the first-person perspective condition having negative consequences. That is, by informing the female participants that there are no gender differences, the threat in the air would be reduced, and the first-person perspective may cease to have any affect. For men, again, no performance difference was expected between the first-person and objective conditions, regardless of whether they were in a stereotype threat situation (threat condition) or a reduced threat situation (no-threat condition).

5.1 Experiment 3

5.1.1. Method

Participants and Design

Participants were 143 students, 74 male and 69 female, from the University of Birmingham (n = 50) and Durham University (n = 93), aged 17-38 (M = 20.68 SD = 2.87). Participants were randomly allocated to one of two Stereotype Threat conditions (threat vs. no-threat) and one of two Perspective conditions (first-person vs. objective).

Procedure

As in Experiment 2, participants were tested individually and gave informed consent prior to beginning the experiment. Participants were verbally informed by the experimenter

that the study consisted of three written tasks related to social psychology, the first being a narrative exercise for which they had five minutes to complete.

Materials

Perspective-taking manipulation. See Experiment 2.

Stereotype threat manipulation. Stereotype threat was manipulated during the verbal instructions for the maths test. Half of the participants from each of the two Perspective conditions (first-person and objective) were allocated to the threat condition, and received the following information:

The second section of this study is designed to investigate individual differences in maths ability. You will receive a maths test, and you will have ten minutes to complete as many questions as you can. The maths test you will receive has been shown to produce gender differences in past research, which means that the average achievement of male participants was different from the average achievement of female participants.

Participants in the no-threat condition were informed:

The second section of this study is designed to investigate individual differences in cognitive processing. You will receive a maths test, and you will have ten minutes to complete as many questions as you can. The maths test you will receive has not been shown to produce gender differences in past research, which means that the average achievement of male participants was equal to the achievement of female participants.

Maths test. Following the stereotype threat manipulation, all participants completed a nine-item mathematics test, matched for difficulty to the test used in Experiment 2 (due to use on a concurrent study, the same maths test could not be used). The questions were selected from AQA GCSE Higher-Tier Section B exam papers (2007-2009), and amalgamated into a single exam paper. Participants were not permitted to use a calculator, were asked to show all their working on the exam paper, and were given ten minutes to

complete the test. Some of the questions had multiple-parts; therefore the maximum score was 16. The maths test used in Experiment 3 can be found in Appendix C

Demographic measures. Following the maths test, participants completed a demographic questionnaire. There was no time-limit for this section, and on finishing participants were fully debriefed and thanked for their participation.

5.1.2 Results

Fourteen cases were excluded from the following analysis; 12 participants failed to complete all of the relevant information (i.e., perspective-taking manipulation, dependent measure, demographics), and two participants had participated in a similar study in the same academic year.

Maths Performance

Maths performance was calculated for each participant as the sum of correct answers for each of the maths test questions, with a maximum score of 16 (minimum = 0). A 2 (Perspective: first-person vs. objective) x 2 (Stereotype Threat: threat vs. no-threat) x 2 (Participant Gender: male vs. female) ANOVA was conducted for maths performance.

A main effect of Participant Gender was found, with male participants (M = 8.75, SD = 3.96, n = 67) answering significantly more maths questions correctly than female participants (M = 6.16, SD = 3.20, n = 62), $F(1, 121) = 15.877$, $p < .001$. However, no main effect of Perspective was found, therefore, there was no significant difference between the maths performance of participants in the first-person condition (M = 7.40, SD = 3.68, n = 62) and objective condition (M = 7.60, SD = 3.98, n = 67), $F(1, 121) = 0.239$, p =.626. Nor was there a main effect of Stereotype Threat, therefore there was no significant difference

between the maths performance of participants in the threat (M = 7.78, SD = 4.00, n = 63) and no-threat conditions (M = 7.24, SD = 3.66, n = 66), $F(1, 121) = 0.40$, $p = .528$.

In addition, each of the three two-way interactions were non-significant; the first between Perspective and Stereotype Threat, $F(1, 121) = 0.282$, $p = .597$, the second between Perspective and Participant Gender, $F(1, 121) = 0.040$, $p = .841$, and the third between Stereotype Threat and Participant Gender, $F(1, 121) = 0.877$, $p = .351$. However, the three-way interaction between Perspective, Stereotype Threat and Participant Gender was significant, $F(1, 121) = 4.407$, $p = .038$. To examine the three-way interaction, further ANOVAs were carried out to analyse the effects of Perspective and Stereotype Threat on maths performance for each Participant Gender.

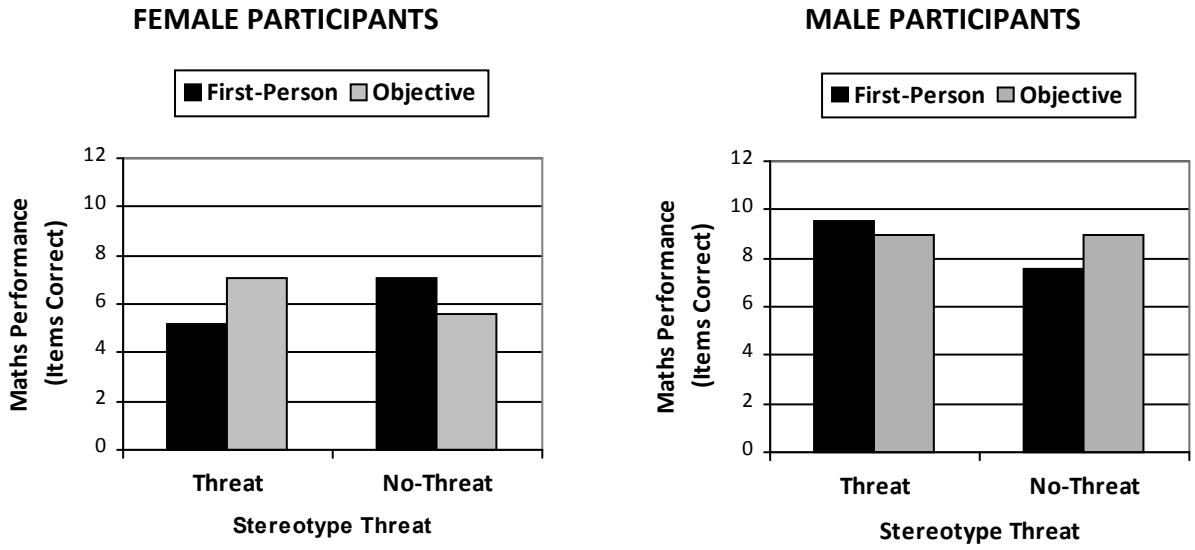


Figure 3. Maths performance of female participants (left) and male participants (right) in the threat and no-threat conditions, when in the first-person perspective and objective conditions.

Male participants. Examining the maths performance of male participants, there was no main effect of Perspective $F(1, 63) = 0.206$, $p = .652$, so there was no significant difference between the performance of male participants in the first-person condition ($M = 8.50$, $SD = 3.65$, $n = 34$) and male participants in the objective condition ($M = 9.00$, $SD = 4.29$, $n = 33$). Similarly, there was no main effect of Stereotype Threat, $F(1, 63) = 1.066$, $p = .306$, therefore there was no significant difference between male participants in the threat ($M = 9.27$, $SD = 3.99$, $n = 33$) and no-threat conditions ($M = 8.24$, $SD = 3.91$, $n = 34$). Finally, the two-way interaction between Perspective and Stereotype Threat was non-significant, $F(1, 63) = 1.066$, $p = .306$. This suggests that the performance of male participants was not affected as a function of either the perspective taken, or by the presence/ not of stereotype threat.

Female participants. Examining the maths performance of female participants, findings at first appeared to follow the same pattern as for male participants, with no main effect of Perspective, $F(1, 58) = 0.051$, $p = .821$, and therefore, no significant difference between the performance of females in the first-person ($M = 6.07$, $SD = 3.32$, $n = 28$) and the objective conditions ($M = 6.24$, $SD = 3.15$, $n = 34$). And there was no main effect of Stereotype Threat, $F(1, 58) = 0.057$, $p = .812$, indicating no significant difference between the performance of females in the threat ($M = 6.13$, $SD = 3.36$, $n = 30$) and no-threat conditions ($M = 6.19$, $SD = 3.11$, $n = 32$). However, in contrast to the findings for males, the analysis revealed a significant two-way interaction between Perspective and Stereotype Threat for female participants, $F(1, 58) = 4.285$, $p = .043$, as shown in Figure 3 (above). T-tests decomposed this interaction further.

Perspective. First, the effect of Stereotype Threat on maths performance was examined independently for each Perspective condition. An independent t-test found no

significant difference between the maths performance of females in the first-person condition who received a stereotype threat manipulation (M = 5.20, SD = 3.00, n = 15) and those in the no-threat condition (M = 7.08, SD = 3.50, n = 13), $t(26) = -1.528$, $p = .139$. Similarly, there was no significant difference between the maths performance of females in the objective condition who received a stereotype threat manipulation (M = 7.07, SD = 3.53, n = 15) and those in the no-threat condition (M = 5.58, SD = 2.73, n = 19), $t(32) = 1.385$, $p = .176$.

Stereotype Threat. Second, the effect of Perspective on maths performance was examined separately for each Stereotype Threat condition. A t-test found no significant difference between female participants in the first-person condition (M = 5.20, SD = 3.00, n = 15) and those in the objective condition (M = 7.07, SD = 2.73, n = 19) when faced with a stereotype threat cue, $t(28) = -1.558$, $p = .130$. Likewise, there was no significant difference between female participants in the first-person condition (M = 7.08, SD = 3.50, n = 13) and those in the objective condition (M = 5.58, SD = 3.53, n = 15) when faced with a no-threat situation, $t(30) = 1.358$, $p = .184$.

These analyses suggest that there was no difference in the performance of female participants regardless of Perspective (first-person vs. objective) or Stereotype Threat (threat vs. no-threat) condition. That no significant differences were found in post-hoc analyses to explain the significant Perspective and Stereotype Threat interaction may have been due to a lack of power due to a an insufficient sample size. However, as shown in Figure 3, the same pattern is evident here as for Experiment 2, with female participants underperforming in the first-person compared to the objective condition following stereotype threat (tantamount to a *threat in the air* in the previous experiments).

5.1.3 Discussion

Two sets of hypothesises were formulated, the first based on the stereotype threat intervention literature, and the second set based on the findings of Experiments 1 and 2 of the current research. From the stereotype threat intervention and perspective-taking literature, it was expected that stereotype threatened female participants taking the perspective of the positively stereotyped male target (first-person condition) would outperform stereotype threatened women who did not perspective-take (objective condition). That is, perspective-taking-induced self-other overlap should lead women to apply positive male target characteristics to their own self-concept, becoming more male-like. As a result, women were expected to become more removed from their negatively stereotyped female identity, and less vulnerable to stereotype threat, in line with interventions which successfully decrease stereotype threat effects by de-emphasising threatened social identities. Moreover, perspective-taking has been found to result in behaviour consistent with the target stereotype, which, in this case, would be better maths performance.

In contrast, from the findings of Experiments 1 and 2 it was expected that women under stereotype threat would underperform in the first-person condition compared to the objective condition. This prediction was based on the idea that stereotype threat would have been experienced by women taking the maths test in Experiments 1 and 2, in line with the idea of a "threat in the air" (Steele, 1997, p. 614). However, in the no-threat condition, the reduction of stereotype threat was expected to inhibit the negative effect of perspective-taking on women's maths performance. For men, who do not contend with a negative stereotype in the domain of maths, no performance difference was expected between the threat and no-threat conditions. In addition, taking the perspective of a target of the same

group membership (male) should not affect performance, therefore no difference was expected between the performance of men in the first-person and objective conditions.

The findings were not entirely in line with either hypothesis. Experiment 3 found a three-way interaction between participant gender, perspective condition, and stereotype threat condition. Further analysis revealed that the maths performance of male participants was not affected as a function of either the perspective taken (first-person vs. objective condition) or by the presence or absence of stereotype threat (threat vs. no-threat condition). This is consistent with the predictions made for male participants based on the stereotype threat and perspective-taking literatures.

However, further analysis also revealed that, despite a two-way interaction between perspective and stereotype threat for female participants, there was no difference in maths performance regardless of perspective taken or stereotype threat condition. This is contrary to the hypothesis from the stereotype threat and perspective-taking literature, where it was expected that stereotype threatened women in the first-person perspective condition would outperform women in the third-person condition. Instead the findings of Experiment 3 suggest that, in line with the findings from Experiments 1 and 2, perspective taking when the target is male (positively stereotyped) does not reduce the negative effect of stereotype threat on women's maths performance. Furthermore, the no-threat condition appears to alleviate the effects of the stereotype.

However, for this to be fully supported, women experiencing stereotype threat should underperform in the first-person compared to the objective condition (replicating Experiment 2). Results of Experiment 3 support this pattern of findings, with female participants underperforming in the first-person condition compared to the objective condition in under stereotype threat. Unfortunately this pattern does not quite reach

significance. One possibility for this may be that the explicit stereotype threat condition of Experiment 3 is not equivalent to the threat in the air which may be occurring in Experiment 2. In sum, Experiment 3 found no significant difference between the maths performance of stereotype threatened female participants in the first-person and objective perspective groups, suggesting that perspective-taking does not successfully reduce stereotype threat effects for women.

Chapter 6: General Discussion

Three experiments examined the effect of perspective-taking on maths performance, a domain in which prior research has suggested that women are negatively stereotyped and men are positively stereotyped (e.g., Steele, 1997; Steele & Aronson, 1995). Experiment 1 (Chapter 3) examined the effect of perspective-taking on the maths performance of men and women when the target of perspective-taking was either male or female (i.e., same or different stereotyped group membership). Experiment 2 (Chapter 4) further explored the effect of perspective-taking on the maths performance of female participants (negatively stereotyped) when the target was male (positively stereotyped), using a different perspective-taking control condition, and a more stereotypical male target. Finally, Experiment 3 (Chapter 5) examined perspective-taking as an intervention method for reducing stereotype threat, a situational threat that past research has found to result in the underperformance of women on maths-based tasks (e.g., Keller, 2007; Schmader & Johns, 2003; Spencer et al., 1999).

6.1 Perspective-Taking and Stereotyping

Perspective-taking has been found to result in a number of cognitive and behavioural outcomes with important social consequences. For example, taking the perspective of a stigmatised group member can lead to reduced stereotyping and prejudice, and more positive beliefs about the stigmatised target, and the target's group (Batson, Polycarpou et al., 1997; Galinsky & Moskowitz, 2000; Vescio et al., 2003). Perspective-taking can also affect beliefs about the self, with recent research demonstrating that perspective-takers adopt targets' stereotypical traits as self-descriptive, regardless of whether those traits are positive or negative (Galinsky et al., 2008).

Research exploring the underlying mechanisms of perspective-taking has suggested that self-other overlap at the level of cognitive representation is responsible for the diverse range of demonstrated effects. That is, taking the perspective of another person (the target) is theorised to result in self-representations and target-representations becoming increasingly similar, such that the cognitive boundaries of the self and target overlap (Davis et al., 1996; Goldstein & Cialdini, 2007). Early work in this area focused on the projective application of self-characteristics onto the target of perspective-taking, which resulted in a more self-like target representation (e.g., Davis et al., 1996). However, more recent evidence suggests that target characteristics can also be included within the self-concept of the perspective-taker, resulting in a more other-like representation of self (e.g., Galinsky et al., 2005; 2008).

Research has yet to determine what mechanisms drive the direction of self-other overlap (i.e., whether overlap is primarily driven by seeing more of the self in the other, or by including more of the other in the self). However, following a review of the perspective-taking literature, Galinsky et al. (2005) concluded that the two processes are unlikely to be discrete phenomena, arguing that self-other merging is a bidirectional process. This idea is illustrated in Galinsky et al.'s (2005) conceptual model of the reciprocal relationship between perspective-taking and the formation of social bonds, in which perspective-taking-induced self-other overlap is represented by two independent pathways, representing the two different overlap processes: (1) inclusion of self in other and (2) inclusion of other in self.

In addition to successfully accounting for changes to the beliefs of perspective-takers, Galinsky et al.'s (2005) model also accounts for the findings of recent research demonstrating that perspective-takers see more of the target in themselves, and act in a manner consistent with the target stereotype. For example, focusing on the stereotype that men are less emotionally sensitive than women, Marx and Stapel (2006) found that female

participants who took the first-person perspective of a (negatively stereotyped) male target not only reported feeling more male-like, but also underperformed on a test of emotional sensitivity compared to women who wrote about the male target from the third-person perspective. Application of target-characteristics to the self, combined with stereotype-consistent behaviour suggests that perspective-taking makes the stereotype self-relevant for the perspective-taker (i.e., the perspective-takers '"become' stereotyped", Marx & Stapel, 2006, p. 769). The findings of Marx and Stapel (2006) are consistent with the second of Galinsky et al.'s (2005) pathways; that is, the inclusion of other in the self resulted in increased stereotypical behaviour in line with the target.

Research into the effects of perspective-taking on behaviour was advanced by Galinsky et al. (2008), who found that perspective-takers demonstrated stereotype-consistent behaviours using a range of different stereotyped targets (e.g., cheerleader, professor, African American man), concluding that the behavioural effect occurred regardless of whether the stereotype was positive or negative. This line of research is particularly interesting in that it highlights a potential benefit of perspective-taking which has not been addressed by the existing literature: if perspective-taking induced self-other overlap results in stereotype-consistent behaviour, it seems reasonable to suggest that perspective-taking could be used to change the behaviour of negatively stereotyped group members, such that they perform in line with a positive target stereotype in the stereotyped domain.

While Marx and Stapel (2006) included both male and female participants in their study, they presented all participants with a negatively stereotyped target (male), and therefore did not explore the effect of a positive target stereotype on behaviour. Furthermore, other research into the behavioural effects of perspective-taking has overlooked the effects of participant group membership in relation to target group

membership when investigating the behavioural effects of perspective-taking (e.g., Galinsky et al., 2008). Therefore, the first aim of the experiments presented in this thesis was to further the research of Marx and Stapel (2006) and Galinsky et al. (2008) by examining the behaviour of perspective-takers who are themselves negatively stereotyped, while the target is from a positively stereotyped group.

Experiment 1 addressed this aim, examining the effect of perspective-taking on the maths performance of male (positively stereotyped) and female (negatively stereotyped) participants when the target of perspective-taking was either male (positively stereotyped) or female (negatively stereotyped). Perspective-taking was manipulated by having participants write about the target from either a first-person or third-person perspective, based on the method used by Marx and Stapel (2006). The findings of Experiment 1 were intriguing. Firstly, male participants (positively stereotyped) writing about a female target (negatively stereotyped) performed better in the first-person than the third-person perspective condition. Secondly, regardless of perspective or participant gender, there was no difference in the performance of participants who wrote about a male target.

The findings of Experiment 1 on the whole do not appear to be consistent with the account of perspective-taking induced self-other merging, as described in Galinsky et al.'s (2005) model. According to Galinsky et al. (2005), one outcome of perspective-taking is the inclusion of other-representations in the self, such that the self-concept comes to share more features with the target of perspective-taking (i.e., the other), leading to an increase in stereotype-consistent behaviour. Therefore, it was expected that positively stereotyped male participants in Experiment 1 who took the perspective of a negatively stereotyped female target (by writing from the first-person perspective) would underperform on the maths test compared to male participants in the third-person condition. However, when presented with

a female target, men performed better in the first-person compared to the third-person condition. This is not only inconsistent with predictions derived from the Galinsky et al. (2005) model, but is also inconsistent with Marx and Stapel (2006) who found – using the same perspective-taking manipulation as employed in Experiment 1 – that perspective-taking made a negative target stereotype self-relevant for positively stereotyped participants, resulting in the underperformance of perspective-takers (first-person condition) compared to control participants (third-person condition).

In addition, the finding that there was no difference between the performance of participants when writing about a male target regardless of perspective or participant gender was also inconsistent with expectations. Based on the predictions of Galinsky et al.'s (2005) model, taking the perspective of a male target (positively stereotyped) was expected to improve the performance of female participants (negatively stereotyped) relative to a non-perspective-taking control condition. As this did not occur, the findings of Experiment 1 do not appear to support Galinsky et al.'s (2005) model.

However, it has been argued within the perspective-taking literature that considering a target from the first-person perspective and considering a target from the third-person perspective may actually represent two different ways of perceiving the other's situation; that is, two different ways of perspective-taking (Batson, Early et al., 1997). Therefore, it is possible that in the first-person condition, individuals took the perspective of the target by imagining themselves in the position of the target, and how they *personally* would feel as a result, while in the third-person condition, participants took the perspective of the target by imagining how the *target* would feel. In such a way, both conditions can be perceived as perspective-taking. In light of this, Experiment 2 replaced the third-person condition with

an objective condition as a control, based on the method employed by Batson, Early et al. (1997).

Building on the findings of Experiment 1, Experiment 2 explored the male target condition further, focusing exclusively on the performance of female participants. This allowed for further examination of the effect of perspective-taking on the behaviour of negatively stereotyped participants when the target was a positively stereotyped group member. In addition to employing a different control condition (i.e., objective condition) it was decided to present the male target as a stereotypical maths student, rather than a generic college student, in line with previous perspective-taking studies which have used a typical exemplar (Galinsky & Ku, 2004; Galinsky & Moskowitz, 2000; Galinsky et al., 2008).

Experiment 2 found that women in the objective condition performed significantly better on the maths test than women in the first-person condition, suggesting that taking the perspective of a positively stereotyped target (man) does not improve the performance of negatively stereotyped participants (women). This is counter to expectations based on Galinsky et al.'s (2005) model, that perspective-taking would lead to self-other overlap and stereotype consistent behaviour (i.e., a higher score on the maths test than women in the objective condition). However, there are similarities with this finding and the results of Experiment 1; specifically, male and female participants in Experiment 1 showed no difference in maths test performance when presented with a male target, regardless of condition. Taken together, Experiments 1 and 2 suggest that perspective-taking induced self-other merging does not occur when the target is from a positively stereotyped group, and the participant is from a negatively stereotyped group.

6.2 Prime-to-Behaviour as an Explanation

Galinsky et al.'s (2005) model fails to account for the findings of Experiments 1 and 2. However, the prime-to-behaviour literature, which forms the basis of the perspective-taking literature, may offer an interesting account of the findings. As discussed in Chapter 1, prime-to-behaviour research has demonstrated that priming (activating a mental representation) of a stereotypical construct can result in behavioural *assimilation* effects: complex behaviour in line with the activated stereotype. For example, Dijksterhuis and van Knippenberg (1998) found that priming the stereotype of a college professor (stereotypically intelligent) improved the performance of students on a general knowledge task, while activating the stereotype of a soccer hooligan (stereotypically unintelligent) decreased performance on the same task. Similar to the importance placed on changes to the self-concept of the perspective-taker in explaining the behavioural effects of perspective-taking (i.e., during self-other overlap), recent research has theorised that the self-concept plays a key role in the occurrence of prime-to-behaviour effects. Specifically, Wheeler et al. (2007) detail a perceptual route for prime-to-behaviour effects, arguing that primes affect behaviour indirectly via changes to the active self-concept; changes which are determined based on the immediate social context.

Further evidence that primes influence behaviour indirectly via their effect on the self-concept derives from research demonstrating various self-relevant moderators of prime-to-behaviour effects (see Smeesters et al., 2010, for a review). This line of research has also discovered that primes – under certain circumstances – can lead to changes to the active self-concept in a direction opposite to the prime construct, resulting in behavioural *contrast* (as opposed to assimilative) effects. Of interest to the results of Experiments 1 and 2 presented in this thesis, Dijksterhuis, Spears et al. (1998) found that while participants primed with

abstract stereotypical constructs tended to demonstrate stereotype assimilation, those primed with discrete exemplars (i.e., concrete instantiations) of the same stereotypes were more likely to demonstrate behavioural contrast effects. Specifically, priming participants with the abstract stereotype of a professor or a supermodel resulted in, respectively, improved or diminished performance on a test of general knowledge; however, priming exemplars of a professor (Albert Einstein) or a supermodel (Claudia Schiffer) led to the reverse pattern. This builds on the work of earlier studies which found judgmental contrast effects following the priming of extreme and specific exemplars (e.g., Herr, 1986; Herr, Sherman, & Fazio, 1983; Manis, Nelson, & Shedler, 1988; Stapel, Koomen, & van der Pligt, 1997). Dijksterhuis, Spears et al. (1998) concluded that *what* we perceive has a tangible influence on the resulting behavioural effect of perception, such that priming exemplars can lead to "seeing the individual *in front of* the stereotype" (p. 863), evoking a spontaneous social comparison between exemplar and perceiver (Gilbert et al., 1995) which overrides the assimilative effect of the activated construct, and results in behavioural contrast.

As the perspective-taking condition in the current research involved participants being primed with a target individual representing a stereotype (i.e., an exemplar) this may provide an account for the findings of Experiments 1 and 2. That is, in line with the theorising of Dijksterhuis, Spears et al. (1998), presenting participants with "Paul", the male target exemplar, would prime them with a concrete instantiation of a positively stereotyped group member (and likewise in Experiment 1, "Paula", the female exemplar, would represent a concrete example of a negatively stereotyped group member). The primed individual may then engage in spontaneous social comparison with the exemplar, which has the potential to result in a behavioural contrast effect, if the self is perceived to be highly discrepant from the prime.

In other words, perspective-taking with a male exemplar is argued to evoke a comparison with the self, leading individuals to conclude that they are relatively poor at maths (and vice-versa for the female exemplar); this process results in behavioural contrast, in line with the findings of Dijksterhuis, Stapel et al. (1998). This idea is particularly intriguing in that one difference between the current research and that of Marx and Stapel (2006) was the use of a photograph of the target; therefore, it could be that the target in Marx and Stapel's (2006) study was perceived as an abstract stereotype, in contrast to the exemplar used in Experiments 1 and 2.

Behavioural contrast in the context of the current research would be realised as underperformance on the maths test after taking the perspective of the male target exemplar (positively stereotyped group member), in comparison to a non-perspective-taking control group. This accurately describes the pattern of results found for female participants in Experiment 2, providing support for the idea that contrast occurs following perspective-taking with an exemplar. Furthermore, the finding that men in Experiment 1 who took the perspective of a female target exemplar (negatively stereotyped group member) performed better than men who wrote about a female target from the third-person perspective is also consistent with this explanation of results.

However, for the behavioural contrast theory to be fully supported, female participants in Experiment 1 would be expected to perform worse on the maths test after taking the perspective of a male target exemplar, and this was not found to be the case (there was no difference between the performance of women in the first-person and objective conditions). One reason for this may be that the male target used in Experiment 1 was not a sufficiently strong exemplar. Dijksterhuis, Stapel et al. (1998) explicitly state that an exemplar must be "sufficiently extreme and concrete" (p. 863) in order to override the behavioural

assimilation effects which are characteristic of priming with abstract constructs and stereotypes. The male target photograph used in Experiment 2 was modified to represent a male *maths student*, as opposed to simply a male student (as in Experiment 1), and is therefore very likely to have represented an extreme and concrete exemplar of the category "mathematically-identified men". However, it is more difficult to state if the male target used in Experiment 1 represents an extreme exemplar of this category, primarily as there is little information in the literature to directly clarify the term "extreme". This is an area which would benefit from further research.

Similar to Dijksterhuis, Stapel et al. (1998), Gilbert et al. (1995) also argue that the likelihood of a spontaneous comparison following priming is increased when the target is extreme. They further contend that comparison is most likely when the target has been (a) recently encountered, and (b) explicitly judged. Gilbert et al.'s (1995) argument may help to account for why there is a difference in performance between the two perspective conditions in the current research. As participants in both the perspective-taking and control conditions receive a photograph of an exemplar, following the behavioural contrast literature one might expect participants in both conditions to underperform. However, it is only in the perspective-taking condition that participants have the opportunity to reflect on the individual as a typical group member, and therefore explicitly judge them as such (Gilbert et al., 1995). This has important implications for the priming literature, in that it may not be enough to simply prime with an exemplar to produce contrast effects. In light of the findings of this thesis (and the theorising of Gilbert et al., 1995), it appears that there must also be the opportunity to conceptualise the target as a typical group member, in a different group membership to oneself. It is clear that further research is needed to clarify this.

6.3 Perspective-Taking and Stereotype Threat

The second aim of this thesis was to examine perspective-taking as a possible stereotype threat intervention. Research has suggested a number of interventions through which stereotype threat effects can successfully be reduced: (1) structuring the stereotype threatened individual's perceptions about negative stereotypes and their applicability to the test situation; (2) structuring the stereotype threatened individual's beliefs about threat; (3) de-emphasising threatened social identities. This final method is similar to the self-other merging phenomenon suggested to underlie perspective-taking, in that the application of other-characteristics to the self-concept during self-other merging is theorised to result in a more other-like representation of the self, potentially decreasing the salience of the threatened identity.

It was therefore considered possible that perspective-taking could reduce stereotype threat. Specifically, if a stereotype threatened individual takes the perspective of a target who is positively stereotyped in the threatened domain, self-other overlap should result in the perspective-taker applying the target's stereotyped characteristics to their own self-concept. This should, in turn, result in the perspective-taker becoming more other-like, demonstrating behaviour consistent with the target stereotype (in line with Galinsky et al.'s, 2005, model). Therefore, in terms of Experiment 3, it was expected that female participants taking the first-person perspective of a male target would perform better under stereotype threat than female participants in the objective condition. Indeed, if the intervention successfully eliminates stereotype threat, the maths performance of women should equal that of men, in line with the findings of previous stereotype threat intervention research (Johns et al., 2005; Martens, Johns, Greenberg, & Schimel, 2006; Marx & Roman, 2002).

However, the findings of Experiments 1 and 2 suggest that perspective-taking does not have positive consequences for negatively stereotyped group members, with women underperforming in the first-person condition relative to the objective condition (Experiment 2). Based on these findings, it was thought that the same pattern would be observed under stereotype threat (but not in the absence of stereotype threat). This is because, while Experiments 1 and 2 do not explicitly manipulate stereotype threat, research has established that simply being in a stereotype-relevant situation is sufficient to elicit stereotype threat (McIntyre, Paulson, & Lord, 2003; Quinn & Spencer, 2001; Rosenthal & Crisp, 2006; Smith & White, 2002), in line with the idea of a "threat in the air" (Steele, 1997, p. 614). Therefore, the stereotype threat condition in Experiment 3 was theoretically similar to the situation which female participants encountered in Experiments 1 and 2. In contrast, the no-threat condition in Experiment 3 explicitly reduced stereotype threat by stating that the maths test had not produced gender differences the past, thus eliminating the threat in the air.

Therefore, based on the idea that the threat condition in Experiment 3 was similar to Experiments 1 and 2, predictions were made in line with the findings of the first two experiments. Specifically, female participants in the threat condition were expected to underperform on the maths test when in the first-person condition compared to the objective condition. However, in the no-threat condition (where stereotype threat is reduced) it was thought that suggesting that the maths test was not gender-biased would stop the first-person condition having a negative impact on women's performance. For men, performance was not expected to differ between the first-person and objective conditions, regardless of whether they were in a stereotype threat situation or not. This is because men are positively stereotyped in the test domain, therefore they are not susceptible to stereotype

threat, and taking the perspective of a same-gender target should not affect their performance.

The findings of Experiment 3 were not entirely in line with the hypotheses based on the perspective-taking and stereotype threat literature, nor were they consistent with the hypotheses based on the findings of Experiments 1 and 2. There were, however, a number of interesting findings. Male participants answered significantly more maths questions correctly than did female participants, regardless of perspective (first-person vs. objective) or stereotype threat (threat vs. no-threat) condition. In addition, Experiment 3 found a significant interaction between perspective and stereotype threat for female participants. The pattern of results appeared to show that female participants under threat performed better on the maths test in the objective as opposed to the first-person perspective condition, with the opposite pattern occurring in the no-threat condition; however, post-hoc analysis was unable to reveal where the difference lay.

The finding that men outperformed women on the maths test regardless of perspective or stereotype threat conditions is consistent with the stereotype that women are poor at maths, and supports existing evidence of the gender-gap in maths achievement (Brown & Pinel, 2003; Good et al., 2003; Rosenthal et al., 2007). Furthermore, despite the apparent failure of taking the perspective of a (positively stereotyped) male target as a strategy to decrease the susceptibility of women to stereotype-threat effects, the absence of a significant performance difference between male and female participants in the no-threat condition suggests that the no-threat condition alleviated the effects of the stereotype. This is in line with the findings of Experiments 1 and 2 of the current research; however, for this theory to be fully supported, women in the threat condition should underperform in the first-person condition compared to the objective condition (replicating Experiment 2). This

did at first appear to be the case. Experiment 3 found that female participants underperformed in the first-person condition compared to the objective condition; however, this finding did not quite reach significance. One possibility for this may be that the stereotype threat activating cues used in Experiments 2 and 3 were not equivalent in terms of the level of threat experienced by female participants. That is, Experiment 3 explicitly manipulated stereotype threat by informing participants in the threat condition that the maths test had produced gender differences in past research; Nguyen and Ryan (2008) categorise this as a moderately explicit threat-activating cue. This is in contrast to the threat in the air which female participants may have experienced in Experiment 2, which Nguyen and Ryan (2008) categorise as an indirect and subtle (or implicit) threat-activating cue. In a meta-analysis on stereotype threat effects using studies which focused on minorities (and intelligence) and women (and maths), Nguyen and Ryan (2008) found that subtle threat-activating cues produced the largest stereotype threat effect, followed by blatant and moderately explicit cues, arguing that the stereotype may work at an implicit level, directly affecting performance.

In sum, while the findings of Experiment 3 are not entirely in line with all of the expectations based on the two previous experiments, the findings from all three experiments do at least agree that there is no evidence to suggest that perspective-taking can reduce stereotype threat.

6.4 Theoretical Implications and Future Directions

The experiments presented in this thesis contribute to the theoretical model outlined by Galinsky et al. (2005). Galinsky et al.'s (2005) model suggests that perspective-taking results in the bidirectional overlap of self and other cognitive representations, such that the self is applied to the other (resulting in reduced stereotypical judgements of others) and the

other is included in the self (resulting in increased stereotypical behaviour of the self). However, the experiments presented here suggest that this is not the case when the target and perspective-taker are from group memberships which differ in terms of the stereotype associated with their group.

In order to examine this finding further, future research should investigate the boundaries of this effect, with a focus on clarifying the processes which lead to behavioural contrast (as opposed to assimilation effects) following perspective-taking. This may primarily involve exploring the concept and definition of an extreme exemplar, and subsequently involve a comparative examination of the effects of extreme exemplars versus abstract stereotype constructs on the performance of perspective-takers.

Based on the current findings, it would seem that contrast effects upon taking the perspective of an exemplar occur only when perspective-taker and target belong to different stereotyped groups; however, these results are tentative and should be replicated before firm conclusions can be drawn. Similarly, it is not clear whether this pattern holds only for the women and maths stereotype explored in this thesis, or whether the effect generalises to other similarly negative societal stereotypes. This is a further avenue for exploration. Finally, it is important for future research to address the attitude of perspective-takers toward targets of different group memberships to their own, in order to fully relate this line of research to Galinsky et al. (2005) model, which details both cognitive and behavioural effects of perspective-taking.

The finding of Experiments 1 and 2 of the current research, that taking the perspective of a target exemplar of the opposite group membership led to behavioural contrast (as opposed to assimilation effects), meant that the failure of the perspective-taking intervention to protect women against stereotype threat effects (Experiment 3) was not

unexpected. Future research in this area should take its lead from the findings of further examination into the behavioural effects of perspective taking, suggestions for which are outlined above.

6.5 Summary

In summary, the findings of the current research suggest that perspective-taking when the target belongs to a different stereotyped group to that of the perspective-taker does *not* lead to behavioural assimilation, and behaviour consistent with the target stereotype, as was expected in line with Galinsky et al.'s (2005) model. Specifically, Experiment 1 found that men (positively stereotyped group membership) who took the perspective of a female target (negatively stereotyped group membership) performed better on a maths test than men who did not perspective-take. Furthermore, Experiment 2 found that when taking the perspective of a male target, women underperformed in the perspective-taking compared to the objective control condition.

The findings of the first two experiments were interpreted in terms of the prime-to-behaviour literature, which has reported behavioural contrast effects upon priming with an extreme and concrete exemplar of a stereotyped group (e.g., Dijksterhuis, Spears et al., 1998). That is, it was tentatively argued that perspective-taking, when the target is an extreme exemplar of a different group membership to the perspective-taker, leads to spontaneous social comparison, and behavioural contrast (as opposed to assimilation). Finally, the finding of Experiment 3 that perspective-taking does not buffer against the effects of stereotype threat for women in the domain of maths, whilst disappointing, was in line with the findings of Experiments 1 and 2 and consistent with the interpretation of results based on the behavioural contrast literature.

References

Alter, A. L., Aronson, J., Darley, J. M., Rodriguez, C., & Ruble, D. N. (2010). Rising to the threat: Reducing stereotype threat by reframing the threat as a challenge. *Journal of Experimental Social Psychology, 46*, 166-171.

Ambady, N., Paik, S. K., Steele, J., Owen-Smith, A., & Mitchell, J. P. (2004). Deflecting negative self-relevant stereotype activation: The effects of individuation. *Journal of Experimental Social Psychology, 40*, 401-408.

Anderson, N. H. (1968). Likableness ratings of 555 personality-trait words. *Journal of Personality and Social Psychology, 9*, 272-279.

Aron, A., & Aron, E. N. (1986). *Love and the expansion of the self: Understanding attraction and satisfaction*. Washington, DC: Hemisphere.

Aron, A., & Aron, E. N. (1996). Self and self-expansion in relationships. In G. J. O. Fletcher & J. Fitness (Eds.), *Knowledge structures in close relationships: A social psychological approach* (pp. 325-344). Mahwah, NJ: Erlbaum.

Aron, A., & Aron, E. N. (1997). Self-expansion motivation and including other in the self. In S. Duck (Ed.), *Handbook of personal relationships: Theory, research and interventions* (2nd ed., pp. 251-270). New York: Wiley.

Aron, A., Aron, E. N., Tudor, M., & Nelson, G. (1991). Close relationships as including other in the self. *Journal of Personality and Social Psychology, 60*, 241-253.

Aron, A., & McLaughlin-Volpe, T. (2001). Including others in the self: Extensions to own and partner's group memberships. In C. Sedikides & M. Brewer (Eds.), *Individual self, relational self, collective self* (pp. 89-108). Philadelphia, PA: Psychology Press.

Aronson, J., Fried, C., & Good, C. (2002). Reducing the effects of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology, 38,* 113-125.

Aronson, J., Jannone, S., McGlone, M., & Johnson-Campbell, T. (2009). The Obama effect: An experimental test. *Journal of Experimental Social Psychology, 45*, 957-960.

Aronson, J., Lustina, M. J., Good, C., & Keough, K. (1999). When white men can't do math: Necessary and sufficient factors in stereotype threat. *Journal of Experimental Social Psychology, 35*, 29-46.

Aronson, J., Quinn, D. M., & Spencer, S. J. (1998). Stereotype threat and the academic underperformance in minorities and women. In J. Swim & C. Stangor (Eds.), *Prejudice: The target's perspective*. New York: Academic Press.

Batson, C. D. (1991). *The altruism question: Toward a social-psychological answer*. Hillsdale, NJ: Erlbaum.

Batson, C. D. (1998). Altruism and prosocial behaviour. In D. T. Gilbert, S. T. Fiske, & G. Lindsey (Eds.), *The handbook of social psychology* (Vol. 2, pp. 282-316). Boston: McGraw Hill.

Batson, C. D., Batson, J. G., Todd, M. R., Brummet, B. H., Shaw, L. L., & Aldeguer, M. R. (1995). Empathy and the collective good: Caring for one of the others in a social dilemma. *Journal of Personality and Social Psychology, 68*, 619-631.

Batson, C. D., Early, S., & Salvarani, G. (1997). Perspective-taking: Imagining how another feels versus imagining how you would feel. *Personality and Social Psychology Bulletin, 23*, 751-758.

Batson, C. D., Polycarpou, M. P., Harmon-Jones, E., Imhoff, H. J., Mitchener, E. C., Bednar, L. L., Klein, T. R., & Highberger, L. (1997). Empathy and attitudes: Can

feeling for a member of a stigmatized group improve feelings toward the group? *Journal of Personality and Social Psychology, 72*, 105-118.

Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behaviour: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology, 71*, 230-244.

Beilock, S. L., Jellison, W. A., Rydell, R. J., McConnell, A. R., & Carr, T. H. (2006). On the causal mechanisms of stereotype threat: Can skills that don't rely heavily on working memory still be threatened? *Personality and Social Psychology Bulletin, 32,* 1059–1071.

Bell, A. E., Spencer, S. J., Iserman, E., & Logel, C. E. R. (2003). Stereotype threat and women's performance in engineering. *ASEE Journal of Engineering Education, 19*, 307-312.

Ben-Zeev, T., Fein, S., & Inzlicht, M. (2005). Arousal and stereotype threat. *Journal of Experimental Social Psychology, 41*, 174-181.

Bernstein, W. M., & Davis, M. H. (1982). Perspective-taking, self-consciousness and accuracy in person perception. *Basic and Applied Social Psychology, 3*, 1-19.

Biernat, M., Vescio, T. K., & Green, M. L. (1996). Selective self-stereotyping. *Journal of Personality and Social Psychology, 71*, 1194-1209.

Bosson, J. K., Haymovitz, E. L., & Pinel, E. C. (2004). When saying and doing diverge: The effects of stereotype threat on self-reported versus non-verbal anxiety. *Journal of Experimental Social Psychology, 40*, 247-255.

Brown, R. P., & Pinel, E. C. (2003). Stigma on my mind: Individual differences in the experience of stereotype threat. *Journal of Experimental Social Psychology, 39*, 626-633.

Burkley, M., Parker, J., Stermer, S. P., & Burkley, E. (2010). Trait beliefs that make women vulnerable to math disengagement. *Personality and Individual Differences, 48*, 234-238.

Cadinu, M., Maass, A., Frigerio, S., Impagliazzo, L., & Latinotti, S. (2003). Stereotype threat: The effect of expectancy on performance. *European Journal of Social Psychology, 33*, 267-285.

Campbell, S. M., & Collaer, M. L. (2009). Stereotype threat and gender differences in performance on a novel visuospatial task. *Psychology of Women Quarterly, 33*, 437-444.

Carpenter, W. B. (1874). *Principles of mental physiology with their applications to the training and discipline of the mind, and the study of its morbid conditions*. New York: Appleton.

Chartrand, T. L., & Bargh, J. A. (1999). The chameleon effect: The perception-behaviour link and social interaction. *Journal of Personality and Social Psychology, 76*, 893-910.

Chen, M., & Bargh, J. A. (1997). Nonconscious behavioural confirmation processes: The self-fulfilling nature of automatically activated stereotypes. *Journal of Experimental Social Psychology, 33*, 541-560.

Cialdini, R. B., Brown, S. L., Lewis, B. P., Luce, C., & Neuberg, S. L. (1997). Reinterpreting the empathy-altruism relationship: When one into one equals oneness. *Journal of Personality and Social Psychology, 73*, 481-494.

Clark, A. E., & Kashima, Y. (2007). Stereotypes help people connect with others in the community: A situated functional analysis of the stereotype consistency bias in communication. *Journal of Personality and Social Psychology, 93*, 1028-1039.

Cohen, G. L., Garcia, J., Apfel, N., & Master, A. (2006). Reducing the racial achievement gap: A social-psychological intervention. *Science, 313*, 1307-1310.

Cole, B., Matheson, K., & Anisman, H. (2007). The moderating role of ethnic identity and social support on relations between well-being and academic performance. *Journal of Applied Social Psychology, 37,* 592-615.

Croizet, J., & Claire, T. (1998). Extending the concept of stereotype and threat to social class: The intellectual underperformance of students from low socioeconomic backgrounds. *Personality and Social Psychology Bulletin, 24*, 588-594.

Croizet, J., Després, G., Gauzins, M., Huguet, P., Leyens, J., & Méot, A. (2004). Stereotype threat undermines intellectual performance by triggering a disruptive mental load. *Personality and Social Psychology Bulletin, 30*, 721-731.

Davies, P. G., Spencer, S. J., & Steele, C. M. (2005). Clearing the air: Identity safety moderates the effects of stereotype threat on women's leadership aspirations. *Journal of Personality and Social Psychology, 88*, 276-287.

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology, 10*, 1-19.

Davis, M. H. (1983). Measuring individual differences in empathy: Evidence for a multidimensional approach. *Journal of Personality and Social Psychology, 44*, 113-126.

Davis, M. H., Conklin, L., Smith, A., & Luce, C. (1996). The effect of perspective-taking on the cognitive representation of persons: A merging of self and other. *Journal of Personality and Social Psychology, 70*, 713-726.

DeMarree, K. G., & Loersch, C. (2009). Who am I and who are you? Priming and the influence of self versus other focused attention. *Journal of Experimental Social Psychology, 45*, 440-443.

Desert, M., Preaux, M., & Jund, R. (2009). So young and already victims of stereotype threat: Socio-economic status and performance of 6 to 9 years old children on Raven's progressive matrices. *European Journal of Psychology of Education, 24*, 207-218.

Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology, 56*, 5-18.

Dijksterhuis, A., & Bargh, J. A. (2001). The perception-behaviour expressway: Automatic effects of social perception on social behaviour. *Advances in Experimental Social Psychology, 33*, 1-40.

Dijksterhuis, A., Spears, R., Postmes, T., Stapel, D., Koomen, W., van Knippenberg, A., & Scheepers, D. (1998). Seeing one thing and doing another: Contrast effects in automatic behaviour. *Journal of Personality and Social Psychology, 75*, 862-871.

Dijksterhuis, A., & van Knippenberg, A. (1998). The relation between perception and behaviour, or how to win a game of trivial pursuit. *Journal of Personality and Social Psychology, 74*, 865-877.

Dijksterhuis, A., & van Knippenberg, A. (2000). Behavioural indecision: Effects of self-focus on automatic behaviour. *Social Cognition, 18*, 55-74.

Dovidio, J. F., ten Vergert, M., Stewart, T. L., Gaertner, S. L., Johnson, J. D., Esses, V. M., Riek, B. M., & Pearson, A. R. (2004). Perspective and prejudice: Antecedents and mediating mechanisms. *Personality and Social Psychology Bulletin, 30*, 1537-1549.

Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist, 41*, 1040-1048.

Dweck, C. S. (1999). *Self-theories: Their role in motivation, personality, and development.* Philadelphia, PA: Taylor & Francis.

Dweck, C. S., & Leggett, E. L. (1988). A social cognitive approach to motivation and personality. *Psychological Review, 95*, 256-273.

Fein, S., & Spencer, S. J. (1997). Prejudice as self-image maintenance: Affirming the self through derogating others. *Journal of Personality and Social Psychology, 73*, 31-44.

Frantz, C. M., Cuddy, A. J. C., Burnett, M., Ray, H., & Hart, A. (2004). A threat in the computer: The race implicit association test as a stereotype threat experience. *Personality and Social Psychology Bulletin, 30,* 1611-1624.

Galinsky, A. D. (2002). Creating and reducing intergroup conflict: The role of perspective-taking in affecting outgroup evaluations. In N. M. A. Mannix, E. A. Mannix, & H. Sondak (Eds.), *Toward phenomenology of groups and group membership* (Vol. 4, pp. 85-113). Greenwich, CT: JAI.

Galinsky, A. D., & Ku, G. (2004). The effects of perspective-taking on prejudice: The moderating role of self-evaluation. *Personality and Social Psychology Bulletin, 30*, 594-604.

Galinsky, A. D., Ku, G., & Wang, C. S. (2005). Perspective-taking and self-other overlap: Fostering social bonds and facilitating social coordination. *Group Processes and Intergroup Relations, 8*, 109-124.

Galinsky, A. D., Magee, J. C., Inesi, M. E., & Gruenfeld, D. H. (2006). Power and perspectives not taken. *Psychological Science, 17*, 1068-1074.

Galinsky, A. D., & Moskowitz, G. B. (2000). Perspective-taking: Decreasing stereotype expression, stereotype accessibility, and in-group favouritism. *Journal of Personality and Social Psychology, 78*, 708-714.

Galinsky, A. D., Wang, C. S., & Ku, G. (2008). Perspective-takers behave more stereotypically. *Journal of Personality and Social Psychology, 95*, 404-419.

Gilbert, D. T., Giesler, R. B., & Morris, K. A. (1995). When comparisons arise. *Journal of Personality and Social Psychology, 69*, 227-236.

Goldstein, N. J., & Cialdini, R. B. (2007). The spyglass self: A model of vicarious self-perception. *Journal of Personality and Social Psychology, 92*, 402-417.

Gonzales, P. M., Blanton, H., & Williams, K. J. (2002). The effects of stereotype threat and double-minority status on the test performance of Latino women. *Personality and Social Psychology Bulletin, 28*, 659-670.

Good, C., Aronson, J., & Harder, J. A. (2008). Problems in the pipeline: Stereotype threat and women's achievement in high-level math courses. *Journal of Applied Developmental Psychology, 29*, 17-28.

Good, C., Aronson, J., & Inzlicht, M. (2003). Improving adolescents' standardised test performance: An intervention to reduce the effects of stereotype threat. *Applied Developmental Psychology, 24,* 645-662.

Grimm L. R., Markman A. B., Maddox W. T., & Baldwin G. C. (2009). Stereotype threat reinterpreted as a regulatory mismatch. *Journal of Personality and Social Psychology, 96,* 288-304.

Hall, N. R., & Crisp, R. J. (2008). Assimilation and contrast to group primes: The moderating role of ingroup identification. *Journal of Experimental Social Psychology, 44*, 344-353.

Hansen, J., & Wänke, M. (2009). Liking what's familiar: The importance of unconscious familiarity in the mere exposure effect. *Social Cognition, 27*, 161-182.

Harrison, L. A., Stevens, C. M., Monty, A. N., & Coakley, C. A. (2006). The consequences of stereotype threat on the academic performance of white and non-white lower income college students. *Social Psychology of Education, 9,* 341-357.

Herr, P. M. (1986). Consequences of priming: Judgment and behaviour. *Journal of Personality and Social Psychology, 51*, 1106-1115.

Herr, P. M., Sherman, S. J., & Fazio, R. H. (1983). On the consequences of priming: Assimilation and contrast effects. *Journal of Experimental Social Psychology, 19*, 323-340.

Hess, T. M., Auman, C., Colcombe, S. J., & Rahhal, T. A. (2003). The impact of stereotype threat on age differences in memory performance. *Journal of Gerontology: Psychological Sciences, 58*, 3-11.

Huguet, P., & Régner, I. (2009). Counter-stereotypic beliefs in math do not protect school girls from stereotype threat. *Journal of Experimental Social Psychology, 45*, 1024-1027.

James, W. (1950). *The principles of psychology*. New York: Holt. (Original work published 1890).

Johns, M., Schmader, T., & Martens, A. (2005). Knowing is half the battle: Teaching stereotype threat as a means of improving women's math performance. *Psychological Science, 16*, 175-179.

Keller, J. (2007). Stereotype threat in classroom settings: The interactive effect of domain identification, task difficulty and stereotype threat on female students' maths performance. *British Journal of Educational Psychology, 77*, 323-338.

Keller, J., & Dauenheimer, D. (2003). Stereotype threat in the classroom: Dejection mediates the disrupting threat effect on women's math performance. *Personality and Social Psychology Bulletin, 29*, 371-381.

Kit, K. A., Tuokko, H. A., & Mateer, C. A. (2008). A review of the stereotype threat literature and its application in a neurological population. *Neuropsychological Review, 18*, 132-148.

Koenig, A. M., & Eagly, A. H. (2005). Stereotype threat in men on a test of social sensitivity. *Sex Roles, 52,* 489-496.

Kohlberg, L. (1976). Moral stages and moralization: The cognitive-developmental approach. In T. Lickona (Ed.), *Moral development and behaviour* (pp. 31-53). New York: Holt, Rinehart, & Winston.

Kray, L. J., Galinsky, A. D., & Thompson, L. (2002). Reversing the gender-gap in negotiations: An exploration of stereotype regeneration. *Organisational Behaviour and Human Decision Processes, 87*, 386-409.

Kray, L. J., Reb, J., Galinsky, A. D., & Thompson, L. (2004). Stereotype reactance at the bargaining table: The effect of stereotype activation and power on claiming and creating value. *Personality and Social Psychology Bulletin, 30,* 399-411.

Kray, L. J., Thompson, L., & Galinsky, A. (2001). Battle of the sexes: Gender stereotype confirmation and reactance in negotiations. *Journal of Personality and Social Psychology, 80,* 942-958.

Kunda, Z. (1999). The case for motivated reasoning. *Psychological Bulletin, 108*, 480-498.

Kunda, Z., & Sinclair, L. (1999). Motivated reasoning with stereotypes: Activation, application, and inhibition. *Psychological Inquiry, 10*, 12-22.

LeBouef, R. A., & Estes, Z. (2004). "Fortunately I'm no Einstein": Comparison relevance as a determinant of behavioural assimilation and contrast. *Social Cognition, 22*, 607-636.

Levy, B. (1996). Improving memory in old age through implicit self-stereotyping. *Journal of Personality and Social Psychology, 71*, 1092-1107.

Leyens, J.-P., Désert, M., Croizet, J.-C., & Darcis, C. (2000). Stereotype threat: Are lower status and history of stigmatization preconditions of stereotype threat? *Personality and Social Psychology Bulletin*, *26,* 1189-1199.

Logel C., Iserman E. C., Davies P. G., Quinn D. M., & Spencer S. J. (2009). Interacting with sexist men triggers social identity threat among female engineers. *Journal of Experimental Social Psychology, 45*, 299-312.

Macrae, C. N., Milne, A. B., & Bodenhausen, G. V. (1994). Stereotypes as energy-saving devices: A peek inside the cognitive toolbox. *Journal of Personality and Social Psychology, 66*, 37-47.

Major, B., & Schmader, T. (1998). Coping with stigma through psychological disengagement. In J. K. Swim & C. Stangor (Eds.), *Prejudice. The target's perspective* (pp. 219-241). San Diego, CA: Academic Press.

Major, B., Spencer, S. J., Schmader, T., Wolfe, C. T., & Crocker, J. (1998). Coping with negative stereotypes about intellectual performance: The role of psychological disengagement. *Personality and Social Psychology Bulletin, 24,* 34-50.

Manis, M., Nelson, T. E., & Shedler, J. (1988). Stereotypes and social judgment: Extremity, assimilation, and contrast. *Journal of Personality and Social Psychology, 55*, 28-36.

Markus, H., & Wurf, E. (1987). The dynamic self-concept: A social psychological perspective. *Annual Review of Psychology, 38*, 299-337.

Martens, A., Johns, M., Greenberg, J., & Schimel, J. (2006). Combating stereotype threat: The effect of self-affitmation on women's intellectual performance. *Journal of Experimental Social Psychology, 42*, 236-243.

Marx, D. M., & Goff, P. A. (2005). Clearing the air: The effect of experimenter race on target's test performance and subjective experience. *British Journal of Social Psychology, 44*, 645-657.

Marx, D. M., Ko, S. J., & Friedman, R. A. (2009). The "Obama Effect": How a salient role model reduces race-based performance differences. *Journal of Experimental Social Psychology, 45*, 953-956.

Marx, D. M., & Roman, J. S. (2002). Female role models: Protecting women's math test performance. *Personality and Social Psychology Bulletin, 28*, 1183-1193.

Marx, D. M., & Stapel, D. A. (2006). It depends on your perspective: The role of self-relevance in stereotype-based underperformance. *Journal of Experimental Social Psychology, 42*, 768-775.

McGlone, M. S., & Aronson, J. (2006). Stereotype threat, identity salience, and spatial reasoning. *Journal of Applied Developmental Psychology, 27,* 486-493.

McGlone, M. S., Aronson, J., & Kobrynowicz, D. (2006). Stereotype threat and the gender gap in political knowledge. *Psychology of Women Quarterly, 30*, 392-398.

McIntyre, R. B., Paulson, R. M., & Lord, C. G. (2003). Alleviating women's mathematics stereotype threat through salience of group achievements. *Journal of Experimental Social Psychology, 39*, 83-90.

Mead, G. H. (1934). *Mind, Self and Society*. Chicago: University of Chicago Press.

Neuville, E., & Croizet, J. (2007). Can salience of gender identity impair math performance among 7-8 years old girls? The moderating role of task difficulty. *European Journal of Psychology of Education, 22*, 307-316.

Nguyen, H, D., & Ryan, A. M. (2008). Does stereotype threat affect test performance of minorities and women? A meta-analysis of experimental evidence. *Journal of Applied Psychology, 93*, 1314-1334.

Nussbaum, A. D., & Steele, C. M. (2007). Situational disengagement and persistence in the face of adversity. *Journal of Experimental Social Psychology, 43*, 127-134.

Piaget, J. (1932). *The moral judgement of the child*. London: Kegan, Paul, Trench, & Trubner.

Pickett, C. L., Bonner, B. L., & Coleman, J. M. (2002). Motivated self-stereotyping: Heightened assimilation and differentiation needs result in increased levels of positive and negative self-stereotyping. *Journal of Personality and Social Psychology, 82*, 543-562.

Pratto, F., & Bargh, J. A. (1991). Stereotyping based on apparently individuating information: Trait and global components of sex stereotypes under attention overload. *Journal of Experimental Social Psychology, 27*, 26-47.

Quinn, D. M., Kahng, S. K., & Crocker, J. (2004). Discreditable: Stigma effects of revealing a mental illness history on test performance. *Personality and Social Psychology Bulletin, 30*, 803-815.

Quinn, D. M., & Spencer, S. J. (2001). The interference of stereotype threat with women's generation of mathematical problem-solving strategies. *Journal of Social Issues, 57*, 55-71.

Rosenthal, H. E. S., & Crisp, R. J. (2006). Reducing stereotype threat by blurring intergroup boundaries. *Personality and Social Psychology Bulletin, 32*, 501-511.

Rosenthal, H. E. S., Crisp, R. J., & Suen, M-W. (2007). Improving task performance expectancies in stereotypic domains: Task relevance and the reduction of stereotype threat. *European Journal of Social Psychology, 37*, 586-597.

Ruscher, J. B. (1998). Prejudice and stereotyping in everyday communication. *Advances in Experimental Social Psychology, 30*, 241-307.

Rydell R. J., & Boucher, K. L. (2010). Capitalizing on multiple social identities to prevent stereotype threat: The moderating role of self-esteem. *Personality and Social Psychology Bulletin, 36*, 239-250.

Rydell R. J., McConnell A. R., & Beilock S. L. (2009). Multiple social identities and stereotype threat: Imbalance, accessibility, and working memory. *Journal of Personality and Social Psychology, 96*, 949-966.

Schmader, T. (2010). Stereotype threat deconstructed. *Current Directions in Psychological Science, 19*, 11-18.

Schmader, T., & Johns, M. (2003). Converging evidence that stereotype threat reduces working memory capacity. *Journal of Personality and Social Psychology, 85*, 440-452.

Schubert, T. W., & Hafner, M. (2003). Contrast from social stereotypes in automatic behaviour. *Journal of Experimental Social Psychology, 39*, 577-584.

Schwinghammer, S. A., Stapel, D. A., & Blanton, H. (2006). Different selves have different effects: Self-activation and defensive social comparison. *Personality and Social Psychology Bulletin, 32*, 27-39.

Shih, M., Pittinsky, T. L., & Ambady, N. (1999). Stereotype susceptibility: Identity salience and shifts in quantitative performance. *Psychological Science, 10*, 80-83.

Shih, M., Wang, E., Bucher, A. T., Stotzer, R. (2009). Perspective-taking: Reducing prejudice towards general outgroups and specific individuals. *Group Processes and Intergroup Relations, 12*, 565-577.

Smeesters, D., Wheeler, S. C., & Kay, A. C. (2010). Indirect prime-to-behaviour effects: The role of perceptions of the self, others, and situations in connecting primed constructs to social behaviour. *Advances in Experimental Social Psychology, 42*, 259-317.

Smeesters, D., Yzerbyt, V. Y., Corneille, O., & Warlop, L. (2009). When do primes prime? The moderating role of the self-concept in individuals' susceptibility to priming effects on social behaviour. *Journal of Experimental Social Psychology, 45*, 211-216.

Smith, E. R. (1996). What do connectionism and social psychology offer each other? *Journal of Personality and Social Psychology, 70*, 893-912.

Smith, E. R. (1999). Affective and cognitive implications of a group becoming part of the self: New models of prejudice and of the self-concept. In D. Abrams & M. A. Hogg (Eds.), *Social identity and social cognition* (pp. 183-196). Malden, Massachusetts: Blackwell Publishers Ltd.

Smith, E. R., & DeCoster, J. (1998). Knowledge acquisition, accessibility, and use in person perception and stereotyping: Simulation with a recurrent connectionist network. *Journal of Personality and Social Psychology, 74*, 21-35.

Smith, J. L., & White, P. H. (2002). An examination of implicitly activated, explicitly activated, and nullified stereotypes on mathematical performance: It's not just a women's issue. *Sex Roles,* 47, 179-191.

Spears, R., Gordijn, E., Dijksterhuis, A., & Stapel, D. A. (2004). Reaction in action: Intergroup contrast in automatic behaviour. *Personality and Social Psychology Bulletin, 30*, 605-616.

Spencer, S. J., Steele, C. M., & Quinn, D. M. (1999). Stereotype threat and women's math performance. *Journal of Experimental Social Psychology, 35*, 4-28.

Stapel, D. A., Koomen, W., & van der Pligt, J. (1997). Categories of category accessibility: The impact of trait versus exemplar priming on person judgments. *Journal of Experimental Social Psychology, 33*, 44-76.

Steele, C. M. (1997). A threat in the air: How stereotypes shape intellectual identity and

performance. *American Psychologist, 52*, 613-629.

Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African-Americans. *Journal of Personality and Social Psychology, 69*, 797-811.

Steele, J., James, J. B., & Barnett, R. (2002). Learning in a man's world: Examining the perceptions of undergraduate women in male-dominated academic areas. *Psychology of Women Quarterly, 26*, 46-50.

Stone, J., Lynch, C. I., Sjomeling, M., & Darley, J. M. (1999). Stereotype threat effects on Black and White athletic performance. *Journal of Personality and Social Psychology, 77*, 1213-1227.

Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: A self-categorization theory*. Oxford, UK: Blackwell.

Turner, J. C., Oakes, P. J., Haslam, S. A., & McGarty, C. (1994). Self and collective: Cognition and social context. *Personality and Social Psychology Bulletin, 20*, 454-63.

van den Bos, A., & Stapel, D. A. (2009). Why people stereotype affects how they stereotype: The differential influence of comprehension goals and self-enhancement goals on stereotyping. *Personality and Social Psychology Bulletin, 35*, 101-113.

Vescio, T. K., Sechrist, G. B., & Paolucci, M. P. (2003). Perspective-taking and prejudice reduction: The meditational role of empathy arousal and situational attributions. *European Journal of Social Psychology, 33*, 455-472.

Walton, G. M., & Spencer, S. J. (2009). Latent ability: Grades and test scores systematically underestimate the intellectual ability of negatively stereotyped students. *Psychological Science, 20*, 1132-1139.

Weyant, J. (2007). Perspective-taking as a means of reducing negative stereotyping of individuals who speak English as a second language. *Journal of Applied Social Psychology, 37*, 703-716.

Wheeler, S. C., DeMarree, K. G., & Petty, R. E. (2007). Understanding the role of the self in prime-to-behaviour effects: The Active-Self account. *Personality and Social Psychology Review, 11*, 234-261.

Wheeler, S. C., Jarvis, W. B. G., & Petty, R. E. (2001). Think unto others: The self-destructive impact of negative racial stereotypes. *Journal of Experimental Social Psychology, 37*, 173-180.

Wheeler, S. C., Morrison, K. R., DeMarree, K. D., & Petty, R. E. (2008). Does self-consciousness increase or decrease behavioural priming effects? It depends. *Journal of Experimental Social Psychology, 44*, 882-889.

Wheeler, S. C., & Petty, R. E. (2001). The effects of stereotype activation on behaviour: A review of possible mechanisms. *Psychological Bulletin, 127*, 797-826.

Wright, S. C., Aron, A., McLaughlin-Volpe, T., & Ropp, S. A. (1997). The extended contact effect: Knowledge of cross-group friendships and prejudice. *Journal of Personality and Social Psychology, 73*, 73-90.

Yeung, N. C. J., & von Hippel, C. (2008). Stereotype threat increases the likelihood that female drivers in a simulator run over jaywalkers. *Accident Analysis and Prevention, 40,* 667-674.

Appendices

Appendix A: Experiment 1 Materials

Consent sheet

Your responses in this experiment will be totally confidential. They will simply be collated with a large number of other participants' responses to give an aggregate score. You are, of course, entitled to decline to answer any question you like, or to leave the experiment at any point.

Do you consent to participate in the study? YES / NO

Do you understand that you are free to withdraw from the study:

* at any time and
* without having to give a reason for withdrawing and
* without any adverse result of any kind? YES / NO

Signed .....……..... Date ……

(NAME IN BLOCK LETTERS)

.....…….....

Participant Instructions

- 25 minutes are allocated for this exercise.
- Your teacher will inform you of the time-limits for each section.
- Please complete all sections of the exercise in order.
- Do not confer with your classmates.

- Any information stated during the exercise will remain anonymous.
- Please note that participation is voluntary and you are within your rights to withdraw at any point.
- You will be fully de-briefed following participation. If you have any further queries please refer them to your teacher.

Please study the photograph:

This is Paula. She is 17 years old, and is currently studying for her A-Levels at college.
Please write a short passage about a typical day in Paula's life, using the **first-person perspective** (i.e. "**I** wake up and….")

Please study the photograph:

This is Paula. She is 17 years old, and is currently studying for her A-Levels at college.

Please write a short passage about a typical day in Paula's life, using the **third-person perspective** (i.e. "**She** wakes up and….")

Please study the photograph:

This is Paul. He is 17 years old, and is currently studying for his A-Levels at college.

Please write a short passage about a typical day in Paul's life, using the **first-person perspective** (i.e. "**I** wake up and….")

Please study the photograph:

This is Paul. He is 17 years old, and is currently studying for his A-Levels at college.

Please write a short passage about a typical day in Paul's life, using the **first-person perspective** (i.e. "**I** wake up and….")

- You have **ten minutes** to complete as many maths questions as you can.
- **The use of a calculator is not permitted.**
- The questions can be **attempted in any order.**
- Each question is worth **1 mark**.
- Please use the space provided to do any workings out (these will not be marked) but be careful to write your final answer in the indicated space.
- There are a total of 30 questions (from page 1 to page 7).

---

1. People waiting for a bus were made up of 2 groups of 26 and 4 groups of 24. All of these people needed a seat, how many seats were needed?

Answer :
_____

2. For a charity dance production, 90 tickets were sold at £2 each and a further 200 reduced price tickets were sold at £1.50 each. How much money was raised?

Answer :
_____

3. A telephone conversation, which lasted 2 ½ hours, started at 15:40. What time did the phone call end? Please use the 24 hour clock.

Answer :
_____

4. Pens cost 20p each for the first 30 purchased and 15p for each additional pen. What was the total cost of purchasing 33 pens?

Answer :
_____

5. In a hotel, 23 out of 25 rooms were occupied. What was the number of occupied rooms as a percentage?

Answer :
_____

6. Last year a take-away pizza cost £5. This year the cost has increased by 13%. How much does the pizza cost this year?

Answer :
_____

7. A group travelled 75 miles on a train trip to a concert. Using the conversion of 8 kilometres being equal to 5 miles, how many kilometres did they travel?

Answer :
_____

8. The pass mark for an exam was 40%. The exam had 80 questions worth 1 mark each. To pass the test, how many questions had to be answered correctly?

Answer :
_____

9. In a group of 21 people, 2/7 were wearing jeans. How many people were wearing jeans?

Answer :
_____

10. Results showed that 80% of people in one running team finished a marathon. In the second running team, 22 out of 25 people finished the run. What was the difference between the two groups in the percentage of people finishing the marathon?

Answer :
_____

11. 160 music fans paid £4.50 each to own a limited edition of their favourite song. How much money was made from the sales?

Answer :
_____

12. The price of a meal in Germany was 32€. There are approximately 1.6 euros to the pound. How much was the meal in pounds?

Answer :
_____

13. In a village of 40 households, four-fifths of households owned a computer. How many of the households owned a computer?

Answer :
_____

14. The entrance price for a theme-park is £18. What will the total entrance price be for a group of 25 people?

Answer :
_____

15. A library has an annual budget of £750. £340 of the budget is spent in the first 4 months and £280 is spent in the following 5 months. How much of the budget is left for the rest of the year?

Answer :
_____

16. It is possible to seat 36 people on a coach. How many coaches are needed to seat 430 people?

Answer :
_____

17. A student inherited £350. £225 of this money was spent on a hi-fi system and a further £75 was spent on CDs. What proportion of the inherited money remained? Please give your answer as a fraction in its lowest terms.

Answer :
_____

18. At a theatre production 25 programmes were sold on the first night and 32 on the second night. Each programme cost £5. How much money was made from the sale of the programmes over both nights?

Answer :
_____

19. Two-eighths of 1600 gym members owned life-long membership passes. How many people did not own life-long membership passes?

Answer :
_____

20. A group of friends plan to watch a film on DVD. They need to finish watching the film by 11pm. The film is 1 hour and 49 minutes long. What is the latest time they can begin watching the film?

Answer :
_____

21. An office was offered a 4% discount on all stationary purchased. How much money was saved when the office ordered £800 worth of stationary?

Answer :
_____

22. A fan club has 340 members. Each member is sent 3 stickers. Each sticker costs 5p to produce. How much is the total cost of producing the stickers? Give your answer in pounds.

Answer :
_____

23. A factory worker spends 7 hours and 15 minutes a day working, and works 5 days a week. What is the total time spent working in a week?

Answer :
_____

24. Three-fifths of 25 people living on New Street own a car. What percentage of people on the street do not own a car?

Answer :
_____

25. 48 patients were split equally between 4 doctors. Each patient needed to be seen for 5 minutes. What was the total time each doctor spent with their patients?

Answer :
_____

26. An orchestra on a tour gave a concert to 5 groups of 52 people and 6 groups of 41 people. How many people attended the concerts?

Answer :
_____

27. A company earned £880 profit in the first 4 weeks of business. £220 of this was earned in the first 2 weeks. What proportion of the profit was earned in the second 2 weeks? Please give your answer as a fraction in its lowest terms.

Answer :
_____

28. Travelling to the seaside in their car, a family use 27 litres of petrol. If 4.5 litres equals 1 gallon. How many gallons were used?

Answer :
_____

29. 55% of people at a swimming club gained their bronze award on their first attempt. All remaining swimmers gained the award on their second attempt. There were 60 people in the club. How many people gained the award on their second attempt?

Answer :
_____

30. On a busy Saturday, 48 groups of people booked their summer holidays. Six-eighths have booked holidays abroad. How many groups are going abroad for their holidays?

Answer :
_____

Thank you very much for your help

Please answer the following questions;

1. Please list **all** of the subjects you are currently studying for AS/A-level (e.g. English literature, maths, economics, etc.)

2. What grade did you achieve for GCSE Maths? (Please tick the correct box)

A*	☐
A	☐
B	☐
C	☐
D	☐
E	☐
F	☐
G	☐
U	☐
X	☐
I did not take GCSE Maths	☐

3. Are you currently studying GCSE Maths (perhaps you are re-taking GCSE Maths)? (Please tick)

Yes	☐
No	☐

4. Who do you think will have done better on this test? (Please tick)

Males	☐
Females	☐
Both the same	☐

5. Generally, who are seen as better at Maths? (Please tick)

Males	☐
Females	☐
Both the same	☐

6. Are you allowed extra time in exams? (Please tick)

No ☐
Yes ☐

7. Please state your age;

_____

8. Please state your gender; (please tick)

Male ☐
Female ☐

9. Please state your nationality;

_____

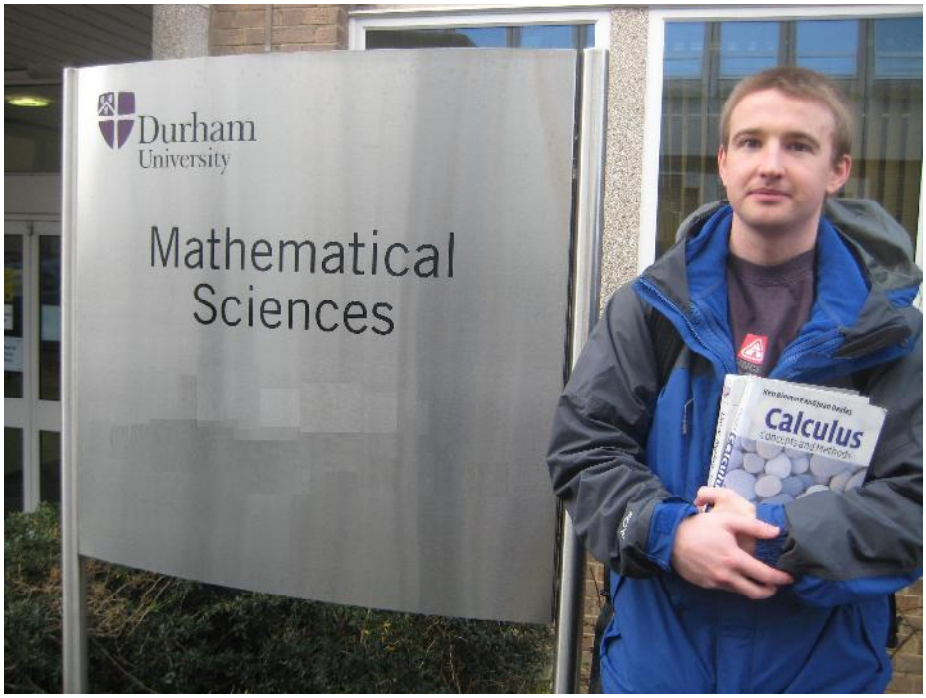
10. Please state your ethnic background;

_____

Thank you very much for your help.

Appendix B: Experiment 2 Materials

Please study the photograph:

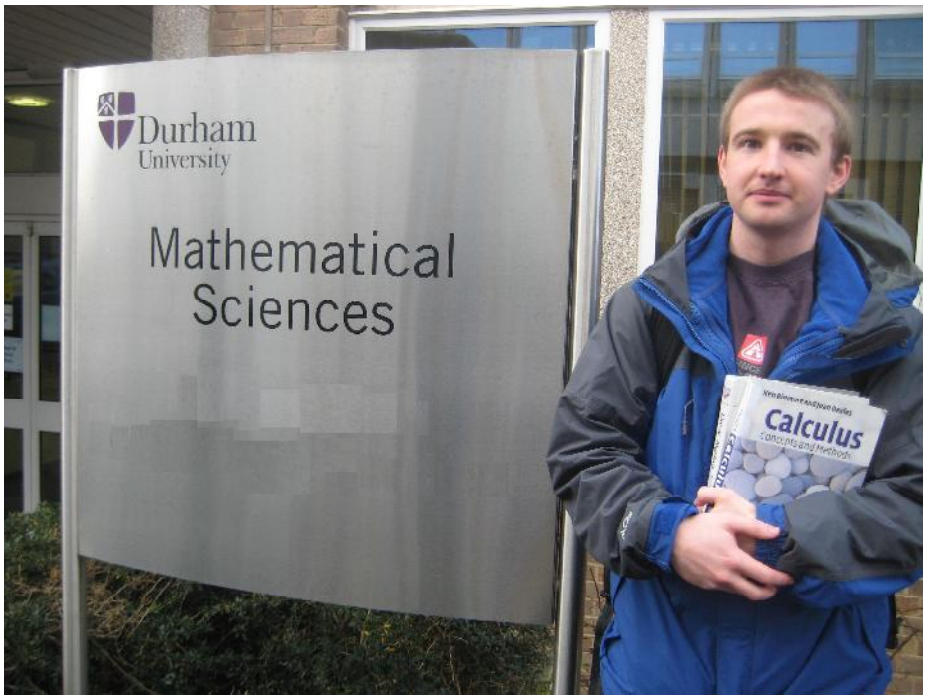


This is Paul. He is 20 years old, and is currently studying maths at university.

Please take Paul's perspective. Clearly visualise what it would be like to *be* Paul and imagine a typical day in his life, looking at the world through his eyes and walking through the world in his shoes.

Now write a short passage about a day in Paul's life as if you were Paul going through his day, using the **first-person** perspective (I.e. "**I** wake up and...").

Please study the photograph:



This is Paul. He is 20 years old, and is currently studying maths at university.

Please write a short passage about a typical day in Paul's life. Do not to concern yourself with how this person feels and what he may have been through, instead, remain detached and unemotional. Try to take a neutral, perspective, and be as **objective** in your description as possible.

1. A snail travels 80 metres in 20 hours.

Find the average speed of the snail in

(a) metres per hour

.....

.....

.....

Answer ..... metres per hour *(2 marks)*

(b) metres per day.

.....

.....

Answer ..... metres per day *(2 marks)*

2. A room has four identical walls.

Each wall needs $\frac{3}{5}$ of a tin of paint.

How many tins of paint are needed to paint all four walls?

.....

.....

.....

Answer ..... *(3 marks)*

3. You are given that $372 \times 51 = 18\,972$

Use this information to find the answers to

(a) 3720×51

Answer ..... *(1 mark)*

(b) $18\,972 \div 5.1$

Answer ..... *(1 mark)*

(c) 372×102

.....

.....

Answer ..... *(1 mark)*

4. Divide £8000 in the ratio 5 : 3 : 2

.....

.....

.....

.....

Answer £ ..... £ ..... £ ..... *(3 marks)*

Turn over for the next question

5. People in the country of Brownland have to pay income tax on the money they earn as shown.

Earnings (£)	Tax to pay
0 – 5000	NIL
Over 5000	20 % on all earnings over £5000

Examples	
Earnings (£)	**Tax to pay**
4000	NIL
13 000	20 % of £8000

Lynn earns £28 000.

Work out the amount of tax that Lynn pays.

.....

.....

.....

.....

Answer £ ..... *(3 marks)*

6. A machine packs grain at a rate of $1\frac{1}{5}$ tonnes of grain per hour.

How long will the machine take to pack 15 tonnes of grain?

.....

.....

.....

.....

.....

Answer ..... *(3 marks)*

7 (a) Write seventy-one million eight hundred thousand in standard form.

Answer ..... *(1 mark)*

(b) Work out $(1.8 \times 10^{7}) \div (3 \times 10^{-4})$
Give your answer in standard form.

.....

.....

.....

Answer ..... *(3 marks)*

8 (a) Write down the number that does **not** have a reciprocal.

Answer ..... *(1 mark)*

(b) Work out $\frac{2\pi}{7} - \frac{\pi}{5}$

.....

.....

Answer ..... *(2 marks)*

Turn over for the next question

9 Surd castle has a drawbridge made in the shape of a cuboid.
The dimensions of the drawbridge are height = $\sqrt{20}$, width = $\sqrt{5}$ and thickness = $\frac{1}{\sqrt{2}}$

All dimensions are given in metres.

(a) Find the volume of the drawbridge.
Give your answer in the form $a\sqrt{2}$, where a is an integer.

Volume of a cuboid = height × width × thickness

.....

.....

.....

Answer ..... m^3 *(3 marks)*

(b) Show that the surface area, in m^2, of the drawbridge is $20 + 3\sqrt{10}$

Surface area of a cuboid = 2 × height × width + 2 × height × thickness + 2 × width × thickness

.....

.....

.....

.....

.....

.....

(3 marks)

END OF QUESTIONS

Please answer the following questions;

1. What degree subject are you currently studying?

2. Did you take maths **GCSE** or equivalent?

YES ☐
NO ☐

If YES please state your maths GCSE grade or equivalent
(i.e. A*,A,B,C etc): _____

3. Did you take maths **AS-level** or equivalent?

YES ☐
NO ☐

If YES please state the AS-level grade you achieved or equivalent: _____

4. Did you take maths **A-level** or equivalent?

YES ☐
NO ☐

If YES please state the A-level grade you achieved or equivalent: _____

5. Are you currently taking / have you taken any maths modules at University?
(*Not* including psychology statistics)

Yes, as part of a maths degree ☐
Yes, but not as part of a maths degree ☐
No ☐

6. Who do you think will have done better on this test? (Please tick)

Males ☐
Females ☐
Both the same ☐

7. Generally, who are seen as better at Maths? (Please tick)

Males ☐
Females ☐
Both the same ☐

8. Are you allowed extra time in exams? (Please tick)

No ☐
Yes ☐

9. Please state your age;

_____

10. Please state your gender; (please tick)

Male ☐
Female ☐

11. Please state your nationality;

_____

12. Please state your ethnic background;

_____

Thank you very much for your help.

Appendix C: Experiment 3 Maths Test

1 (a) Estimate the value of $\frac{39.87}{0.49}$

.....

.....

Answer ..... *(2 marks)*

(b) Work out the time taken to travel 5 miles at 30 miles an hour.
Give your answer in minutes.

.....

.....

.....

Answer ..... minutes *(3 marks)*

2 In a school $\frac{1}{12}$ of the teachers watch reality television.

There are 77 teachers who do **not** watch reality television.

Work out the number of teachers at the school.

.....

.....

.....

Answer ..... *(3 marks)*

3 Given that $\frac{28690}{95} = 302$

(a) write down the answer to 302×950

Answer ..... *(1 mark)*

(b) write down the answer to $\frac{2869}{95}$

Answer ..... *(1 mark)*

(c) work out $100 \times 302 - 5 \times 302$

.....

Answer ..... *(1 mark)*

4 This year a club has 375 members.
This is 25% more than last year.

How many members did the club have last year?

.....

.....

.....

.....

Answer ..... *(3 marks)*

14

5 Year 10 and Year 11 pupils are in an assembly.
Here are some facts about the pupils in the assembly.

Year	boys : girls	Pupil data
10	4 : 5	84 boys
11	2 : 3	150 pupils

Work out the total number of girls in the assembly.
You must show your working.

.....

.....

.....

.....

.....

.....

.....

Answer ..... *(5 marks)*

6 Roger needs $1\frac{2}{3}$ balls of wool to knit one jumper.

He wants to knit two jumpers.

How many balls of wool does he need to buy?

.....

.....

.....

.....

Answer ..... *(2 marks)*

7 (a) Write 1.6×10^7 as an ordinary number in words.

.....

Answer ..... *(1 mark)*

(b) Write 0.00753 in standard form.

.....

Answer ..... *(1 mark)*

8 (a) Write down the reciprocal of 8.

Answer ..... *(1 mark)*

(b) Work out $\frac{3}{7} \div 8$

.....

.....

Answer ..... *(2 marks)*

(c) Work out $3\frac{1}{2} - 1\frac{6}{7}$

.....

.....

.....

Answer ..... *(3 marks)*

15

9 If $a = 5$ and $b = \sqrt{5}$ find the value of

(a) b^{-2}

.....

.....

.....

Answer ..... *(2 marks)*

(b) $\left(\frac{b\sqrt{45}}{a}\right)^{\frac{1}{2}}$

.....

.....

.....

.....

.....

Answer ..... *(3 marks)*

END OF QUESTIONS

5