Intergroup Empathy: Beyond Boundaries

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Abstract

Individuals feel more empathy for those in their group (i.e., ingroup members) and less for those who are not (i.e., outgroup members). But evidence suggests that empathy is not merely selective to the other's group, rather it fluctuates according to how the other's group is perceived by the individual. This project was developed to investigate whether individuals truly differentiate between outgroups when it comes to empathy. Across several studies, I presented participants with images depicting others receiving physically painful stimulations. The other person in each case was a member of the ingroup or one of two outgroups, one of which was more of a competitive threat to the ingroup. In Study 3, I found that participants exhibited an ingroup bias, that is, greater levels of empathy to images of ingroup pain, compared to outgroup pain. In Study 4, I found that empathic responses also varied between the two outgroups: Empathy was significantly lower when targets were from the outgroup that was perceived as more of a competitive threat to the ingroup, than the other outgroup. This provided the first evidence that beliefs about outgroups, and not merely the ingroup-outgroup distinction, modulates empathic processing. I also investigated the extent to which threats that are incidental to the ingroup context affect empathy. Across two studies I showed reliable evidence that priming incidental feelings of fear was sufficient to elicit intergroup bias in self-reported empathy, specifically against the outgroup, i.e., reduced empathy for outgroup targets, rather than increased empathy for ingroup targets. Finally, I investigated the extent to which my findings could be accounted for by individual differences. In a series of 'mini meta-analyses', I provide evidence that in an intergroup context a shared group membership confers an empathic advantage when responding to a target's pain, regardless of one's sex or their scores on a measure of trait empathy.

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1 General Introduction

When we watch a film or play, read a book, or stare at a piece of art we're often moved to emotion. We understand that what we're seeing is not actually happening to us but we react as if it is: We laugh, cry, flinch, and gasp. To understand why this is, we first need to understand what happens when we do experience things first-hand. One way to do this is by considering what happens when we feel physical pain. When we fall over, break a limb, or cut ourselves, certain regions of the brain become active—not one region, but many (Peyron, Laurent, & García-Larrea, 2000). These distinct areas connect to one another and become active at the same time whenever we experience something that is painful. Crucially, though, these same regions also become active when we simply observe another person in pain (Lamm, Decety, & Singer, 2011). In other words, feeling pain and seeing someone else in pain engages the same neural circuitry. In many ways, this phenomenon manifests physically through people's behaviours: When watching videos of someone undergoing invasive surgery, people can't help but winch or retract their limbs into a defensive pose. It is this phenomenon that forms the basis of how we understand and connect with other human beings (de Vignemont & Singer, 2006). A phenomenon that we refer to as empathy.

Whilst there may exist more than a hundred ways to define what we mean by empathy (Cuff, Brown, Taylor, & Howat, 2014), at its core, to empathise with someone is to almost literally feel their pain. It's our capacity to do this that makes films and books so enjoyable. When an actor, writer, or artist moves you to laughter or to tears they implicitly understand that for an audience to feel an emotion the actor/writer need only present a compelling version—the brain simulates the emotions that the observer sees (Chakrabarti, Bullmore, & Baron-Cohen, 2006; Wicker et al., 2003).

We don't, however, go about our daily lives feeling what everyone is feeling and experiencing the world through what we imagine is the other person's eyes. If we did, it would be impossible to, for example, care for patients with chronic pain; to provide therapy for clinical depression; or to surgically remove a cancerous tumour. If we continually felt what other people feel, we'd be so incapacitated by a person's agony that we could do nothing to help them. On a darker note, we could never have performed the acts of barbarity that are scattered in our history; events where people's behaviour was driven by fear and loathing rather than empathy and compassion.

Humans are capable of making tremendous cognitive leaps in order to put themselves in another person's shoes but, seemingly, they are also able to completely avoid doing it (Zaki, 2014). So, how do we switch empathy on and off? The answer is quite simple: When we interact with another person our brain function differs according to a variety of contextual factors such as who the other person is and which social groups they belong to (Cikara & Van Bavel, 2014). We are far more likely to feel the pain of another person if they belong to a group that is the same or similar to our own (Stürmer, Snyder, Kropp, & Siem, 2006; Stürmer, Snyder, & Omoto, 2005). Robert Cialdini, a pioneer of the psychological investigation of empathy, identified that empathy is driven by what he referred to as 'oneness' (Cialdini, Brown, Lewis, Luce, & Neuberg, 1997): If the sense of who you are (i.e., your identity) overlaps with that of another person, you are far more likely to feel their suffering over others to whom there is no, or relatively little, overlap.

Researchers have found that we feel more empathy for members of an ingroup (one of 'us') and notably less for a member of an outgroup (one of 'them')—this is referred to as empathic bias. If the target is one of them, compared to one of us, then we feel less concern for their pain (Stürmer et al., 2006, 2005), perceive their expressions of pain to be less painful (Drwecki, Moore, Ward, & Prkachin, 2011), and even inflict pain upon them more often

(Hein, Silani, Preuschoff, Batson, & Singer, 2010). This empathic bias emerges in a variety of different contexts, for example, when 'them' refers to a race that is different from our own (Avenanti, Sirigu, & Aglioti, 2010; Azevedo et al., 2013; Chiao & Mathur, 2010; Xu, Zuo, Wang, & Han, 2009), when 'they' have different political ideologies (Combs, Powell, Schurtz, & Smith, 2009), support a different sports team (Cikara, Botvinick, & Fiske, 2011), and even when they are simply wearing a different coloured T-shirt (Montalan, Lelard, Godefroy, & Mouras, 2012). More recently, there is accumulating evidence to suggest that empathy is not simply switched on for 'us' and off for 'them'; instead, it fluctuates according to how we perceive 'them' (Cikara & Fiske, 2011). If the person belongs to a group whose members we believe to be friendly and trustworthy, we might feel empathy for them even though they belong to an outgroup (Sessa & Meconi, 2015). But if the other's group represents a threat or a rival to us then we feel less empathy for their pain, or even no empathy at all (Cikara, Bruneau, Van Bavel, & Saxe, 2014).

1.1 Overview of This Thesis

In this thesis, I describe a series of studies in which I investigate whether and how empathy is influenced by a number of different contextual factors. I start by going beyond the existing knowledge outlined above, to test the hypothesis that empathic biases emerge not merely as a function of an ingroup-outgroup distinction but rather as a function of the specific beliefs associated with a given ingroup-outgroup relation. I then go on to examine the extent to which empathy is influenced by other factors, such as individual differences, gender, and fear.

In Chapter 2, I review the extant literature on empathy: How it is defined and studied in the lab. I then go on to discuss empathy through the lenses of Social Identity Theory and the Stereotype Content Model to review the current knowledge of when and why empathy

fails. In Chapter 3, I outline the development of the paradigm that allows me to study empathy. I also present an initial test of the hypothesis that intergroup biases in self-reports of empathy are driven by the context specific to a given ingroup-outgroup relation (such as beliefs about a group) rather than simply an ingroup-outgroup distinction. In Chapter 4, I report on two brain imaging studies to test whether the same context-specific biases also influence empathy at a (non-controllable) neurological level. In these studies, participants performed a cognitive task in which they observed other individuals (from either their own group or from one of two outgroups) experiencing physical pain while participants' neural responses were measured via functional magnetic resonance imaging (fMRI). Self-report results reveal that participants reported less empathy towards outgroup others, but only when that outgroup was perceived to be more of a threat in terms of competition with the ingroup. At the level of neural activation, participants exhibited lower levels of empathy-related brain activation while observing the pain of targets from the more competitive outgroup than targets from the ingroup or less competitive outgroup. In Chapter 5, I discuss the role that incidental fear plays during intergroup relations and the extent to which it influences empathy. I present data from two behavioural studies during which participants completed a task involving empathy while simultaneously receiving (or not) cues to induce fear. The results show that fear attenuated empathic responses, but only to outgroup targets. I discuss how these findings contribute to the existing literature on the role of emotions during intergroup conflict. I also discuss the broader role of threat in empathic bias, demonstrating that threat inherent to the intergroup context (e.g., by competition and social devaluation) can lead to attenuated empathy towards members of an outgroup, but threat from other sources (i.e., that are incidental to the intergroup context) can also affect empathy in the same way.

Chapter 6 outlines a secondary analysis using data from the empirical studies detailed in Chapters 4 and 5. This is an analysis of measures pertaining to the role of individual differences (gender and trait empathy) in empathy. I provide a short overview of the existing research in this area and presented findings from a set of meta-analyses. The results revealed, in short, that scoring above average in some measures of trait empathy correlated significantly with more empathy for another person's suffering. However—consistent with principles from Social Identity Theory—in an intergroup context a shared group membership confers an empathic advantage when responding to a target's pain, regardless of one's chronic tendency to empathise with others. With these results, I provide a revised perspective on the role of individual differences in empathy. Chapter 7 is an overall summary and discussion of the project's main goals and findings. Here, I present an overview my findings, integrate them into existing theory and empirical research, and discuss the implications of my work, what conclusions can be drawn, and what avenues await future researchers.

2 Literature Review

2.1 What Is Empathy?

Since the philosopher Adam Smith first referred to the 'fellow feeling' (Smith, 1790, pp. 47-48) there has been enormous interest in empathy and the psychological mechanisms that underpin it. In the early 1900s, the term 'empathy' (from the German *Einfühlung*) was developed to express the 'natural instinct' of the audience to fuse or merge with an object of exquisite art (Lipps, 1903), sometimes involving the literal and unconscious movement of our legs, arms, or muscles of the face (Lee, 1912). It was not long before scholars began to think of empathy in terms of an interpersonal connection between people. Indeed, Lipps (1903) thought in these terms as well. He described one example of watching an acrobat on a tightrope and how their movements, feelings, and affective expressions are instinctively mirrored by their audience.

Since the mid 1900s, scientific interest in empathy has rapidly grown. According to data from the Web of Science (Clarivate Analytics, n.d.), there have been over 16,000 articles published using the keyword 'empathy' with an average annual growth rate of 15.28%. What we mean when we refer to 'empathy,' however, has also grown somewhat out of control. As one team notes 'there are probably nearly as many definitions of empathy as people working on this topic' (de Vignemont & Singer, 2006, pp. 1). Broadly construed, we understand empathy as the ability to recognize and respond to another's suffering (Batson, Bruce, Ackerman, Buckley, & Birch, 1981). But within that definition is a great deal of ambiguity; it's quite easy to get lost in the search for a precise definition to match one's own notion. For some, empathy is strictly a 'cool' cognitive response characterised by the simulation of another's emotional state, autonomic, and motor responses (Preston & de Waal, 2002), reflecting notions from the original aesthetic movement. For others, empathy is synonymous with sympathy, pity, and compassion, characterised by the feeling that pushes us to alleviate

suffering (C. D. Batson, Fultz, & Schoenrade, 1987). There is also a third sense to empathy that has to do with the capacity to understand what's going on in people's minds. The theory of mentalising or mental-state inference holds that we attribute mental states to others (such as beliefs, emotions, and intentions) and through this understand their behaviour, equivalent to a theory of mind (Frith & Frith, 2006). One could build a career simply investigating the phenomenology of empathy, but for a compelling review of definitions see Leiberg and Anders (2006).

I (like many other empathy researchers) seek a balance between the positions outlined above. In the context of my research, I have found the most constructive way to speak of empathy is as an umbrella term, conceptualising it by three general mechanisms: Mentalising, the ability to infer thoughts or experiences (Davis, 1983); empathic concern, the desire to alleviate a target's distress (C. D. Batson et al., 1987); and experience-sharing, to vicariously experience or simulate another's state (Hatfield, Cacioppo, & Rapson, 1993). These sub-components go by a variety of names, but capture most if not all characterisations of empathy in the literature. It is recognised that these are conceptually distinct processes (Zaki, 2014): I can possess a lot of one and none of the other. Individuals with autistic spectrum disorders, for example, often exhibit a deficit in perspective-taking, but not in experience-sharing (Bird et al., 2010); whereas individuals with psychopathy demonstrate a lack of concern, but no impairment in perspective-taking (Meffert, Gazzola, den Boer, Bartels, & Keysers, 2013). One can also feel more or less of each in a given situation. For example, I intuitively understand why someone is upset over the death of a loved one without needing to experience it first. Despite this, these are not completely independent processes (Zaki & Ochsner, 2012); one can and often does influence another. For example, thinking more deeply about another person's perspective will increase empathic concern for them (C. D. Batson, Klein, Highberger, & Shaw, 1995; C. D. Batson et al., 1997). Because these

processes are strongly related to one another, I define empathy in this broad sense. Doing so allows me to speak in broader terms, but crucially this also allows me to achieve greater precision in understanding how context specifically influences facets of empathy. I therefore do my best in this thesis to be mindful of those similarities but also the distinctions, recognising that different aspects of empathy behave differently in different contexts and are supported by distinct neural architectures.

2.2 The Neural Architecture of Empathy

Historically, empathy was the undertaking of scholars from social, developmental, and psychotherapy fields. It wasn't until 2010—after a ground-breaking discovery by a team in Italy—that it attracted the interest of neuroscientists. This team discovered a specific class of neurons that responded to both the execution of an action and the observation of that same action by another (Rizzolatti & Sinigaglia, 2010). This finding inspired researchers to try and identify the precise neural circuitry responsible for processing empathy. Since then, hundreds of papers have been published providing evidence (sometimes mixed, sometimes converging) that empathy 'resides' in specific and dissociable regions (for a meta-analysis of these findings refer to Lamm, Decety, & Singer, 2011 or Van Overwalle & Baetens, 2009). For example, watching someone being pricked by a syringe leads to activation of the anterior cingulate cortex (ACC; associated with the felt unpleasantness of physical pain i.e., empathic-concern; Rainville, Duncan, Price, & Bushnell, 2011; Singer et al., 2004) and the anterior insula (AI; associated with the sensory-discriminative aspects of pain i.e., experience-sharing; Peyron et al., 2000). On the other hand, mentalising (such as trying to imagine what another person is thinking) is more strongly associated with the medial prefrontal cortex (mPFC), temporoparietal junction (TPJ), precuneus, and posterior superior temporal sulcus (pSTS) (a set of regions referred to as the 'mentalizing network'; Frith & Frith, 2006) (Figure 2.1). Interestingly, while there is evidence to suggest that there is both

dissociation and overlap in the involvement of these regions in different aspects of empathy (Zaki, 2014), there is little research in how they relate to the experience of empathy (i.e., how participants report their empathic experience to another's pain). While not a primary focus of this thesis, one of my goals was to establish whether the brain regions most typically associated with empathy relate differently to how participants self-report their empathic experience.

As many ways there are to define empathy there appear to be as many brain regions to support it. One researcher suggested that empathy was processed through a circuit involving no fewer than ten brain regions (Baron-Cohen, 2011)—many of which are associated with a dozen other mechanisms unrelated to empathy. One might argue that 'finding' empathy in the brain is not necessary—with behavioural and self-report findings, researchers have already developed a very clear understanding of when empathy flourishes and when it fails (e.g., Cialdini et al., 1997). However, self-report measures of empathy are subject to strategic responding given that empathy is a socially desirable trait (Decety & Jackson, 2006). It is therefore likely that measuring responses not within a participant's volitional control (i.e., brain activation) can provide new insights into when and how humans empathise with one another. Indeed, major findings from neuroscience have informed our theoretical understanding of empathy in a number of important ways. For example, fMRI has allowed researchers to demonstrate that empathy involves multiple distinct mechanisms. It has also allowed researchers to study empathy without the filter of response control, revealing that empathy is not a universal response to another's suffering and that the different aspects of empathy are influenced by a number of factors.

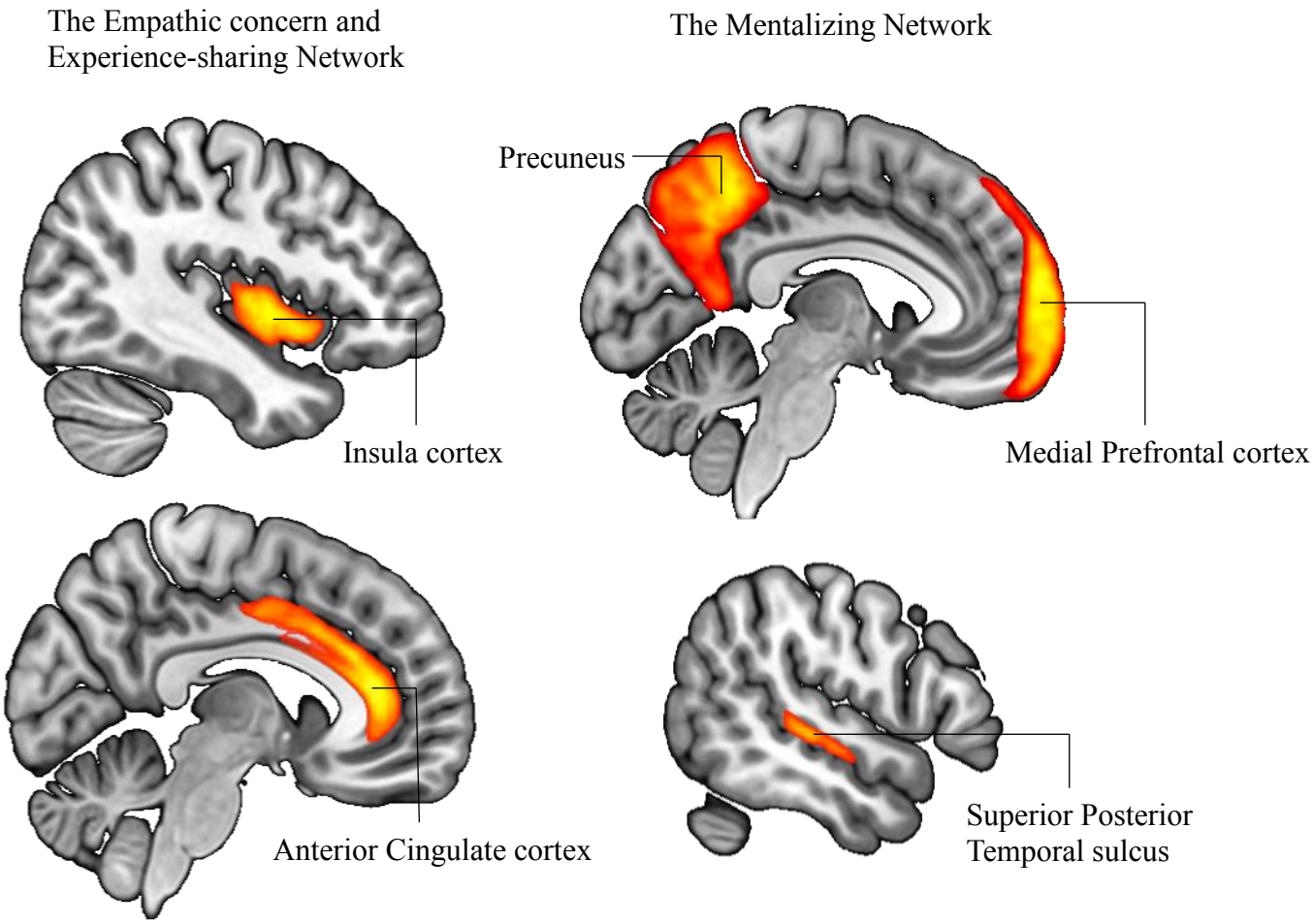

Figure 2.1. Brain maps depicting the most typical regions of activation in response to tasks involving empathic-concern and experience-sharing (left) and tasks involving mentalizing or perspective-taking (right); masks were created using the Harvard-Oxford cortical structural atlas

2.3 The Many Limits of Empathy

Researchers have found that many of the brain regions that ordinarily respond when we see another person suffering or in pain are routinely dampened if the victim is distant to the observer in physical space or time, or socially, in their racial or social group memberships (these findings are reviewed in detail later in the chapter, but for a detailed recent overview, see Vanman, 2016). This is one of many reasons that scholars like Paul Bloom (e.g., 2017) and Jesse Prinz (e.g., 2011) have suggested that we should perhaps re-think how we consider empathy and whether or not large scale interventions to encourage it are actually useful for moral decision-making. Bloom (2017) suggests that to preserve rational moral principles we

should adopt a distant, cost-benefit calculation that is guided not by empathy but by compassion—which while bears great resemblance to empathic-concern differs from it in that it does not require one to vicariously share another person's feelings (Zaki, 2014). The reason for this, Bloom suggests, is that empathy has a 'spotlight quality': Empathy can draw our attention towards the suffering of familiar individuals, but when we try to expand it either to groups of people or to the socially distant, empathy becomes 'dim'—a 'psychic numbing' as Paul Slovic calls it (Slovic, Zionts, Woods, Goodman, & Jinks, 2017). In sum, they suggest that empathy is narrow, parochial, and biased (Bloom, 2017; Prinz, 2011).

The modern conceptualisation of empathy is constructed from decades of studies focusing on interpersonal responses (i.e., participants responding to depictions of a single individual in pain). Indeed, generally, when we feel empathy we do so in relation to a single individual and it is very hard to conceive sharing the emotions of more than one person. The American economist Thomas Schelling illustrates that if a victim is one person needing thousands of dollars for an operation the post will be 'swamped with nickels and dimes', but if a hospital is set to go under, causing an increase in preventable deaths, then 'not many will drop a tear or reach for their check books' (Schelling, 1968). If that victim has a face and a name, we're even quicker to mobilise. Researchers have referred to this as the identifiable-victim effect (Jenni & Loewenstein, 1997). They found that people typically donate more money to help a single, sick child (compared to a group of sick children), if they are first shown a picture of the child and are told their name (Kogut & Ritov, 2005; D. A. Small & Loewenstein, 2003; D. Small, Loewenstein, & Slovic, 2007). This is often why charity appeals depict one person's story rather than presenting an overall picture in which thousands perish every day from famine. In this sense, empathy is limited to the one over the many; if we try to expand it past the individual it waxes and wanes.

Empathy is also limited in the sense that it appears to run out. The more empathy we give to one person, the less we have for another: If I'm busy at work, taking time to engage in effective work relationships with my colleagues, I may deplete those same resources I use to foster personal relationships at home (Halbesleben, Harvey, & Bolino, 2009). Research has shown that this is a particular problem for roles that are cognitively-taxing and laden with empathy. Healthcare workers, for example, are often required to deliberately take on the pain of others: For clinicians to diagnose mental disorder, therapists to broadcast their understanding, or medical practitioners to prescribe pain-relief. After repeated exposure to such suffering, physicians can experience fatigue (Abendroth, 2006). That is, they qualitatively report feeling stressed or burnt out as a result of sharing their patient's suffering and caring for others over extended periods of time (Lombardo & Eyre, 2010). This experience leads to exhaustion, irritability, impairment of decision-making, dread of working with certain patients, and the reduction of empathy (Mathieu, 2007)—effects that also extend to other empathy-centred roles, such as voluntary charity work (Joslyn, 2002).

If empathy is a finite resource, it's intuitive that we might be conservative in where we direct it. If I only have a certain capacity for concern, I'm far more likely to give it to my partner or my son, over a stranger. One wouldn't consider that an unpopular or immoral decision. In the famous example by Bernard Williams, a man who considers saving a stranger over his wife—out of a sense of duty rather immediate conjugal love—has 'one thought too many' (Williams, 1981, pp. 18). But this does illustrate a third way in which empathy is limited.

Empathy can be compromised in a variety of ways. A study led by researchers at the University of Rochester School of Medicine and Dentistry (Fiscella, Franks, Gold, & Clancy, 2000), revealed that healthcare professionals often display biases in how they treat patients. Namely, biases in empathic concern appear to favour individuals with the same race (Chen,

Rathore, Radford, Wang, & Krumholz, 2001; Fiscella, Franks, Doescher, & Saver, 2002), or socioeconomic status (Lundy et al., 2015; Wagstaff, van Doorslaer, & Paci, 1991; Willems, De Maesschalck, Deveugele, Derese, & De Maeseneer, 2005). As a result, ethnic minorities and individuals of low socioeconomic status (who typically experience significantly higher rates of illness) receive the poorest quality of healthcare than others in society (Hayward, Crimmins, Miles, & Yang, 2000). Research suggests that these inequalities do not necessarily reflect pernicious intent of health providers but rather an inability to accurately perceive pain in particular individuals. Hoffman, Trawalter, Axt, and Oliver (2016) found that a substantial number of white medical students and residents held inaccurate beliefs about the biological differences between white and black individuals (such as black people have thicker skin) and these beliefs were strongly related to the inaccurate assessment and treatment of physical pain in black patients. Taken together, these reports suggest that there are inequalities in the extent to which physicians show empathy towards patients and that these perceptions have significant effects on downstream health outcomes (Mercer et al., 2016).

Beliefs about another's group, for example, that they biologically experience pain to a lesser extent, may affect the extent to which we feel empathy towards their pain and suffering; pain that is otherwise objectively equal to your own. A great deal of research has been conducted to understand real-world societal and systemic discrimination, for example, the increasing use of lethal force by authorities against black people in the US (Hehman, Flake, & Calanchini, 2017) or structural inequalities in healthcare (Bailey et al., 2017; Hoffman et al., 2016). These studies have identified that individuals feel less empathy for other race targets (Avenanti et al., 2010; Azevedo et al., 2013; Sessa, Meconi, Castelli, & Dell'Acqua, 2014; Xu et al., 2009). Xu et al. (2009), for example, found that watching individuals receiving painful injections led to activation of regions that process the sensory-discriminative aspects of pain. Crucially, however, they found that activation was

significantly attenuated when the target was from a notably different race to the participant. But this bias is not based simply upon a person's race: Avenanti, Sirigu, and Aglioti (2010) found that seeing a person being stabbed was associated with a mu suppression effect[1] that was attenuated when the target ostensibly belonged to both a familiar racial outgroup (i.e., a black hand) and an unfamiliar racial outgroup (i.e., a violet-coloured hand). This suggests that empathic biases against other-race targets are not necessarily because of beliefs associated with the other's race, per se, but because they represent the unfamiliar, pointing to the more general notion that we feel more empathy for those like us.

This is hardly a novel idea. David Hume said the same thing in the 1700s: He cautioned that 'similarity in our manners, or character, or country, or language…facilitate the sympathy' (Smith & Garrett, 2005, pp. 318). Hume recognised that there is something special about our closest kin that makes them more likely to be the objects of our thoughts and concern. Indeed, for empathy to have evolved it must have conferred some benefits to survival such as in parental and pair bonding (Hrdy, 2009). Several hundred years since Hume, researchers have found evidence to support the notion that similarity is a precursor to empathic processing. For example, empathy is strongest when individuals perceive more similarity or 'oneness' with the target (Maner et al., 2002), share a closer relationship with them (Cialdini et al., 1997), or when they rank the target as higher on measures of attachment (ranging from a romantic partner to familiar acquaintance; Laurita, Hazan, & Spreng, 2017). As Preston and de Waal (2002) put it, a person who is more similar to us is easier to understand and represent at a cognitive level. There is a representational richness in

[1] An electrophysiological measure of resting motor neurons that is suppressed by the execution of movement. The occurrence of such an effect following one's mere observation of another's actions is suggested to be a signature of the mirror neuron system (Hobson & Bishop, 2016).

similar others that drives our ability to share their experiences and feel empathy for their pain.

2.4 Intergroup Empathic Bias

Our preference towards the similar is not limited to interpersonal relationships—where the other may be perceived as individually (dis)similar to us. It also extends to intra- and intergroup interactions. In classic group formation literature, the group is formed on the basis of our similarity with others (Festinger, 1954). Once the group is formed, cohesion between members of the group is a function of mutually perceived similarity (identity) in terms of the characteristics that define the group (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987). In this case, the like-minded or similar others (ingroup members) are often favoured over individuals that differ according to the salient categorisation criteria (outgroup members), a phenomenon referred to as intergroup bias (M. B. Brewer, 1979; Tajfel, 1982).

Our propensity to favour ingroup over outgroup members includes how we respond to their pain and suffering. Stürmer and colleagues (Stürmer et al., 2005, 2006) found that empathy motivates us to help others to the extent that the other is seen as similar to our ingroup. Indeed, since outgroup members are perceived as different from the self it is more challenging to take their perspective and experience empathic concern (Stotland, 1969). This manifests in a variety of ways: More mimicking of expressions and movements displayed by ingroup members (Gutsell & Inzlicht, 2010; Rauchbauer, Majdandžić, Stieger, & Lamm, 2016); greater tendency to feel an ingroup, compared to an outgroup, member's physical pain (Eres & Molenberghs, 2013; Montalan et al., 2012); greater concern for an ingroup member's distress (Tarrant, Dazeley, & Cottom, 2009); and more preferential treatment of ingroup members in downstream moral decision-making, for example, prioritising organ transplants for those we feel a 'oneness' with rather than based on medical urgency (Batson et al., 1995).

This bias (referred to as empathic bias) also arises in a variety of group contexts: In response to racial, political, or social groups (Batson & Ahmad, 2009; Cikara, Bruneau, & Saxe, 2011).

Perhaps unsurprisingly, when groups are in overt competition with one another empathic bias intensifies. Empathy is significantly attenuated towards our competitors and we often even exhibit counter-empathic responses (i.e., joy) to their pain (Smith, Powell, Combs, & Schurtz, 2009). For example, researchers found that football fans not only showed less empathy-related activation when a fan of the rival team experienced physical pain, but also exhibited stronger activity in regions associated with reward processing (ventral striatum) (Hein et al., 2010). This malicious pleasure, or *Schadenfreude*, is often a socially unacceptable response to another's pain but can become normative in a competitive context. This is because those feelings of joy relate to the opportunity for the ingroup to get ahead, particularly if we're first reminded of our own group's inferiority to the rival outgroup (Leach & Spears, 2009); the outgroup's failure can facilitate the engagement of downward, or more favourable, comparisons for the ingroup. Thus, not feeling a rival's pain is motivationally congruent with the desire for self-enhancement at the individual and collective level (Leach, Spears, Branscombe, & Doosje, 2003). Indeed, such responses likely serve an adaptive purpose, drawing our attention away from the negative aspects associated with another's suffering. This is particularly useful when the other is someone we compete with for access to scarce resources (Hill & Buss, 2008). Importantly, Schadenfreude may explain why, during times of conflict, we often act against our moral intuitions and engage in violence towards outgroup others (Cohen, Montoya, & Insko, 2006). For example, participants who showed more reward-related activity when observing a rival's pain were also more likely to harm them (Cikara, Botvinick, & Fiske, 2011).

Intergroup empathic bias occurs even when groups have no long standing feud or history of negative interaction. The tendency to favour ‘us’ over ‘them’ is so pronounced that it even occurs when the group is formed based solely on arbitrary (or minimal) labels such as red and blue team (Montalan et al., 2012). The Minimal Group Paradigm (MGP; Tajfel, Billig, Bundy, & Flament, 1971) is a well-known tool for social psychologists to demonstrate that the categorisation of individuals into two groups, on the basis of a meaningless distinction (such as performance in an arbitrary dot estimation task; Diehl, 1990), is sufficient to produce intergroup bias. Studies using MGPs have demonstrated that individuals feel more empathy for ingroup members compared to outgroup members. For example, individuals rate an ingroup member’s physical pain as more severe than an outgroup member’s (Montalan et al., 2012) and exhibit differential activation of the concern and sharing network (anterior cingulate and anterior insula) according to the other’s performance in a meaningless dot estimation task (Feng et al., 2016).

However, researchers have also been keen to point out that not all outgroups are perceived in the same way: Different outgroups elicit very different beliefs, emotions, and behaviours (Fiske, Cuddy, & Glick, 2007; Fiske, Cuddy, Glick, & Xu, 2002). Indeed, the stereotypes we associate with ingroups and outgroups vary across contexts (Turner et al., 1987). The Stereotype Content Model (SCM; Fiske, Cuddy, Glick, & Xu, 2002) outlines that people rate social groups primarily using two dimensions of content: Competence and warmth. These dimensions intersect to elicit discrete emotions (Fiske et al., 2007). For example, social groups that are perceived as high in both competence and warmth elicit admiration whereas those low in both elicit contempt. These dimensions also relate to other aspects of intergroup relations, including that having higher status leads to one being perceived as more competent, and being perceived as more of a competitor leads to the perception that one is less warm.

Researchers have identified that empathy for another's pain varies as a function of how the other's social group is perceived in terms of competence and warmth (Cikara & Fiske, 2011). In their study, Cikara and Fiske demonstrated that participants reported the most empathic concern for targets of misfortune (such as stepping in chewing gum) if they appeared to belong to a typically pitied social group (one that is perceived as high in warmth but low in competence) but least empathic concern if the target belonged to an envied social group (one that is typically perceived as high in competence but low in warmth). Participants also exhibited greater empathy-related activations in the anterior insula when the suffering target was from a pitied social group, compared to targets from a group that is typically perceived as contemptible (Cikara & Fiske, 2011). This suggests that empathy is not strictly reserved for ingroup members, and not for outgroup members, but is influenced by our expectations about a person based on their specific group membership (i.e., how we perceive them and the stereotypes we hold about the social groups with whom they are associated). This converges with recent evidence demonstrating that beliefs about another's group, such as the extent to which they are seen as trustworthy (Sessa & Meconi, 2015) or likeable (Gutsell & Inzlicht, 2010), substantially distorts one's empathic responses towards them.

This Thesis

My goal with this thesis was to determine whether or not empathic biases emerge specifically according to beliefs about an outgroup. Existing evidence suggests that this is indeed the case however it relies upon the notion that how we perceive particular social groups is fixed. Cikara and Fiske (2011), for example, presented participants with targets from social groups that—through ratings of perceived warmth and competence—fit in particular quadrants of the SCM. These are the admired (e.g., one's ingroup and close allies), envied (e.g., Asians and business professionals), pitied (e.g., elderly and disabled), and contemptible (e.g., drug addicts and homeless). Presenting targets from these groups,

researchers showed that empathy for others depends on how their group is perceived. However the intergroup context is a shifting thing; how we perceive social groups is not stable across contexts. In line with the principles of self-categorisation theory (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987) any social group can be perceived as more or less of a relevant threat based on the salient criteria. Changing one's representations of two groups (e.g., business professionals vs. the elderly) to one of a more inclusive or common group (e.g., White, British, or Western) can substantially improve intergroup contact (Gaertner & Dovidio, 2000).

Compared to a disadvantaged group like the homeless, a business professional is relatively enviable; perceived as high status but cold. When the salient criteria is not wealth, for example comparing a business professional to a member of a minority religious group, the business professional might be perceived quite differently and incorporated within a more common social identity (such as a Christian vs. a Muslim or a religious vs. non-religious person). In this context, we would expect that the typically envied group becomes one of the salient 'us' and is entitled to the benefits associated with that such as being the target of our empathic concern. Clearly, however, we don't need this re-categorisation to occur before feeling empathy—we can feel empathy for the other even when they constitute a salient outgroup. In lieu of re-categorisation, then, what are the nuances in an intergroup context that lead us to feel empathy for some outgroups over others?

The foregoing research suggests that status positions are an important factor in determining empathy for others; that the advantaged groups elicit envy but not empathy whereas the disadvantaged elicit empathy but not envy. I have made the case, however, that the social groups we envy are not the same in every situation and can dynamically switch given the salient criteria for group categorisation. To understand how empathy varies within a given intergroup context we need to give consideration to the relational importance between

different groups. In a given context who is relevant? Who should I be vigilant of? One of the primary goals and key contributions of this thesis is in highlighting the need to avoid being overly general about key concepts and to pay attention towards the importance of content and the specificity of intergroup relations.

An additional goal of this thesis was to provide an initial investigation of the extent to which group-based beliefs alter a specific component of empathy, that is, how we implicitly process another's physical pain (i.e., experience-sharing). There is compelling evidence using race as the salient criteria that shows we process the pain of an outgroup target to be less painful than that an ingroup target's pain (e.g., Xu, Zuo, Wang, & Han, 2009). To a certain extent, the visual differences between races explains a significant proportion of that bias (e.g., Avenanti, Sirigu, & Aglioti, 2010; Azevedo et al., 2013)—that is, empathy is reduced towards a target that is visually different to us even when there is no meaning in that difference (e.g., a non-existent racial group, coloured violet). But when there is meaning in that difference, empathy is even further attenuated (e.g., an existing racial outgroup).

Visual cues to categorisation clearly activate beliefs or prejudices about the other race and this appears to interfere with how we implicitly understand someone's pain. Indeed, Hoffman and colleagues (2016) identified that medical residents perceive an ethnic outgroup's pain as less than an ethnic ingroup's and this owes to false beliefs (or stereotypes) that residents have about the outgroup. This suggests that even at this relatively automatic level of empathy it's not the group distinction that drives bias, per se, but the meaning behind it. But our group memberships are rarely visually marked in this way. What happens to empathy when the other looks the same but is different in some more abstract way? It seems that biases still emerge. For example, if the target is low in socioeconomic status the same bias emerges just as if the target were from an ethnic outgroup (Lundy et al., 2015). So

clearly it is not simply about visual difference it is about the meaning behind that difference—through which visual cues are an efficient (if somewhat inaccurate) route.

My question is, do abstract beliefs about another's group drive biases in pain perception or are they simply used as an adjunct to more salient cues to categorisation? The above research seems to suggest that beliefs drive bias but there is very little experimental evidence to support it. The evidence that does exist primarily uses ethnicity as a salient cue to categorisation. This may not seem like a problem given that the visual cues associated with an ethnic identity are a naturally occurring confound. But as I have mentioned above, a significant portion of the bias in response to an ethnic outgroup's pain is accounted for by visual differences. In order to get a clear test of whether beliefs drive bias I consider it necessary to rule out any bias that emerges simply because the other looks different.

In my research, I studied individuals' empathy in response to a target's physical pain. To investigate the extent to which empathic bias is driven by group-based beliefs, I presented targets from either the salient ingroup or from one of two outgroups—one that was rated to be relatively higher in perceived competence, status, and competition than the other. Crucially, to control for any bias in empathy that may emerge from visual differences, I used targets that were matched for perceived age, race, gender, and physical attractiveness. To measure empathy, I asked participants to respond to self-report items while I simultaneously recorded their neural responses via functional magnetic resonance imaging. With this cutting-edge approach I was able to demonstrate, first, the importance of intergroup relations in predicting empathic bias. Second, my approach revealed a number of interesting effects that may be crucial in guiding future research in the field: I observed that self-reported empathy and the neural signatures associated with empathy do not always converge, but in fact often depart from one another. With this thesis I also advocate for paying particular attention to the

manner in which we measure self-reported empathy because the data I have collected shows that the sorts of items we use plays an important role in eliciting particular styles of thinking.

2.5 Conclusion

In this chapter, I have provided an overview of the literature on empathy. I have discussed how empathy is defined in research contexts and illustrated the various ways in which empathy is studied. I have also outlined the current understanding of when empathy flourishes and when it fails. I have illustrated that there is emerging evidence that empathy is not simply driven by ingroup-outgroup distinctions but rather by contexts that are specific to a given ingroup-outgroup relation, for example, when an outgroup is perceived to be threatening or competitive with the ingroup. Furthermore, I have identified how existing research is limited: Studies that use minimal intergroup contexts do not speak to the notion that empathy may differ between outgroups depending on the intergroup context. Studies that use racial intergroup contexts use identities that are confounded by visually salient characteristics. In Chapter 2, I went into further detail regarding how I have tried to overcome the issues that I have discussed above, justifying my approach with arguments derived from theory and pilot research.

3 The Role of Group Relations in Self-Reported Empathic Bias

The goal of this thesis is to demonstrate that intergroup biases in experience-sharing (a specific facet of empathy) are driven by the context specific to a given ingroup-outgroup relation (such as the beliefs about a group) rather than simply an ingroup-outgroup distinction. In this chapter I describe the development of the paradigm we used to examine this issue.

The paradigms that are typically used to investigate intergroup empathy suffer from two main problems: 1) Minimal group paradigms prime empathic bias in contexts where there are no beliefs about the target group and where empathy is measured in relation to an ingroup and a single outgroup, not multiple outgroups to which the ingroup might relate differently and 2) racial intergroup contexts tap into pre-existing beliefs, but these are confounded by visually salient cues to categorisation.

To clarify whether group-based beliefs can drive biases in experience-sharing it is essential to resolve the issues that I have highlighted above (and discussed in more detail in Chapter 2). Resolving these issues required some thought as to what might be the ideal method through which to elicit 1) experience sharing and 2) intergroup bias in experience sharing. The first part was relatively easy: There are many examples in the literature of paradigms that reliably evoke experience-sharing, most often involving the presentation of images or videos of hands being stabbed or pricked (e.g., Jackson, Brunet, Meltzoff, & Decety, 2006). When deciding which features of the intergroup context to make salient, it was crucial that I ensure the target's identity (e.g., the person being hurt) could be depicted in a manner that was clear to the observer but, at the same time, could be easily manipulated without confounding the identity with visually salient information (such as the race, age, gender, and physical attractiveness of individual targets).

After closely studying the literature, I decided to use university affiliation as a cue to group categorisation. Tarrant, Dazeley, and Cottom (2009) demonstrated the effect of social categorisation on empathic-concern using student identities. In this study, researchers presented students from Keele University in the UK with a target describing a distressful experience. The target was either a student from Keele or a student from Staffordshire University (i.e., a relevant outgroup). Participants (from Keele) showed the expected ingroup preference, reporting stronger empathic-concern and helping intentions toward students from Keele, compared to students from Staffordshire University. In the context of my research, student identity was certainly an easily accessible identity to impose as a social categorisation, while controlling for other social categories (such as race, age, and gender), since participants were students who were recruited exclusively from one specific university. University affiliation is not visible by default, therefore the identity could be easily manipulated, requiring only an additional cue (a text prompt, as I elected to do, or a symbol, such as an object with a logo) to indicate the university to which the student was affiliated.

With a university context in mind, I needed to select two universities that could function as an outgroup to the ingroup university (the University of Exeter) and that differed in how they are perceived by participants (i.e., students at Exeter). In the first pilot study, I aimed to select which universities to use in the main studies. To do this, I measured participants' perceptions of their group (fellow students from the University of Exeter) compared to a selection of outgroups. Given the importance of a background of similarity in engaging in relevant comparisons (Tesser & Campbell, 1980), I selected outgroups that shared geographical proximity to the ingroup (i.e., universities within the south west of the UK). Given that competitive threat and perceived rivalry are key dimensions of intergroup empathic bias (Cikara, Bruneau, Van Bavel, & Saxe, 2014), I chose universities that were

also closely matched in status positions—based on attributes that are relevant to the categorisation as a student for example, entry requirements and national ranking.

In the second study, I aimed to test the appropriateness of the selected intergroup contexts to examine empathic biases, measuring whether and how participants' empathic responses varied as a function of the group membership of the target. Empathy was measured using two self-report items, one that was constructed to gauge the extent to which the participant perceived the image as unpleasant for them to observe (i.e., a self-focussed response; e.g., Lamm, Nausbaum, Meltzoff, & Decety, 2007), and the other item to gauge their feelings of concern towards the target (i.e., an other-focussed response). Self- and other-focussed responses to pain rely on distinct processes and are supported by separate neural networks (Zaki, Ochsner, Hanelin, Wager, & Mackey, 2007). It was expected that self-focussed items would be associated more strongly with regions that process the sensory-discriminative aspects of pain i.e., experience-sharing (AI; Peyron et al., 2000) than other-focussed items, which I expected to be associated more strongly with regions that support the ability to infer what the other person is thinking/feeling (the mentalising network; Frith & Frith, 2006). There is very little research that considers the influence that self-report measures can have on empathy. With this analysis I hoped to demonstrate the need to carefully consider how we use and construct self-report items.

3.1 Study 1

3.1.1 Method

Design. This study followed a repeated measures design with target identity as the only manipulated variable (University of Exeter, Cardiff University, University of Bath, University of Plymouth, and University of Bristol). The ingroup was the university where the study was conducted (University of Exeter).

Participants. A total of 47 first and second year students at the University of Exeter (M_{age} = 19.87, *SD* = 1.20, 28 female) completed an online survey concerning their perceptions of students at UK universities. Participants were recruited through the online Psychology Research Participation System (SONA) and offered entry into a lottery of one £20 Amazon voucher as remuneration for their time. The study was approved by the Ethics Committee of the School of Psychology, University of Exeter. Participant consent was obtained according to the Declaration of Helsinki (World Medical Association, 2013).

Measures. Participants completed measures of perceived group competence (3 items on seven-point scales, all alphas > .80; e.g., to what extent do you think that students of the University of Exeter are generally perceived as competent within British society?), sociability (3 items, all alphas > .80; adapted from Fiske, Cuddy, Glick, & Xu, 2002, e.g., to what extent do you think that students of the University of Exeter are generally perceived as warm within British society?), status (4 items, all alphas > .90; e.g., to what extent do you think that Exeter is a prestigious university?), rivalry (2 items, all alphas > .80, Doosje, Ellemers, & Spears, 1995; e.g., to what extent do you see Cardiff students as rivals of Exeter students?), and similarity (2 items, all alphas > .80, Simon, 1992; e.g., to what extent do you think that students at Cardiff University are similar to students from the University of Exeter?). All items were completed by reference to all of the groups, so participants completed these five times, with the exception of perceived similarity and rivalry—these items were only asked with reference to the outgroups (and not the ingroup) since they were always asked in relation to the ingroup. For a full account of these measures please see Appendix A.

Procedure. To make the social identity based on university affiliation salient, participants were informed that the research concerned Exeter students' opinions of students at other UK Universities. After providing informed consent, participants were presented with

a set of 66 items and were asked to indicate on a 7-point scale (1 = not at all to 7 = very much) to what extent they agreed with each statement, for example:

> "To what extent do you think that students of Exeter University are generally perceived as competent within British society?"

The items were ordered according to the target group rather than according to the measure (i.e., participants completed all items regarding one group before moving on to the next). The order in which participants rated target groups was randomised. The measures were ordered in the following way: Competence, sociability, status, similarity, and rivalry. The order of measures was not randomised in order to avoid cross item influence, for example, feelings of rivalry influencing perceived competence and status. Upon completing the questionnaire, participants were given a full debriefing as to the background and purpose of the study and given the opportunity to ask questions.

3.1.2 Results

All alphas were greater than .80, therefore ratings of each perceived attribute were compiled into a single average score per target group, per participant. All *p* values correspond to two-tailed tests, Bonferroni-corrected, unless noted otherwise.

Competence and sociability. A repeated measures analysis of variance (ANOVA) revealed that there was significant variability in how participants rated the perceived competence of the target groups, F (4, 180) = 32.33, $p < .001$, $\eta^2 = .42$. While participants rated their ingroup (M = 5.48, SD = 1.08) as significantly more competent than students at Cardiff (M = 4.76, SD = .94), t (45) = 5.49, p <.001, 95% CI [.45, .98], d = .71 and Plymouth (M = 4.29, SD = 1.05), t (45) = 7.12, p <.001, 95% CI [.85, 1.52], d = 1.12, they rated students at Bath (M = 5.57, SD = .70), t (45) = -.769, p =.446, 95% CI [-.34, .15], d = .09 and Bristol (M = 5.61, SD = .79), t (45) = -.852, p =.399, 95% CI [-.44, .18], d = .14, to be as

competent as the ingroup. Relative to the ingroup (M = 5.09, SD = 1.05), participants rated students from Plymouth (M = 4.62, SD = .92) to be significantly lower in perceived sociability, t (46) = 2.97, p =.047, 95% CI [.15, .77], d = .48, but equal to students from Cardiff (M = 4.87, SD = .82), t (46) = 1.64, p =.107, 95% CI [-.05, .49], d = .23, Bath (M = 5.01, SD = .91), t (46) = .62, p =.537, 95% CI [-.16, .30], d = .08, and Bristol (M = 4.88, SD = .96), t (46) = 1.36, p =.182, 95% CI [-.10, .51], d = .21 (see Figure 3.2).

Group status. Participants' ratings of group status were similar to their ratings of perceived group competence, F (4, 184) = 37.73, p < .001, η^2 = .45: Participants rated their ingroup (M = 5.39, SD = 1.12) as significantly more competent than students at Cardiff (M = 4.43, SD = 1.03), t (46) = 5.21, p <.001, 95% CI [.59, 1.34], d = .89, and Plymouth (M = 3.71, SD = 1.14), t (46) = 8.28, p <.001, 95% CI [1.28, 2.09], d = 1.49, but rated students at the ingroup university as equal in competence as students at Bath (M = 5.41, SD = 1.02), t (46) = -.195, p =.846, 95% CI [-.30, .25], d = .18, and Bristol (M = 5.61, SD = 1.02), t (46) = -.107, p =.915, 95% CI [-.42, .38], d = .21.

Similarity and rivalry. Participants' ratings of perceived similarity significantly varied between the target groups, F (3, 138) = 29.49, p < .001, η^2 = .39. Students at Bath (M = 5.31, SD = .92) were rated as significantly more similar to the ingroup, relative to students at Cardiff (M = 4.59, SD = .88), t (46) = 4.62, p <.001, 95% CI [.40, 1.02], d = .79, and Plymouth (M = 3.84, SD = 1.22), t (46) = 7.42, p <.001, 95% CI [1.07, 1.87], d = 1.36, but not relative to students at Bristol (M = 5.27, SD = .99), t (46) = .249, p =.804, 95% CI [-.30, .39], d = .04. Participants also rated groups as varying in perceived rivalry with the ingroup, F (3, 138) = 32.19, p < .001, η^2 = .41. Students at Bath (M = 5.14, SD = 1.00) were rated as significantly more of a rival to the ingroup, relative to students at Cardiff (M = 4.16, SD = .90), t (46) = 6.05, p <.001, 95% CI [.66, 1.31], d = 1.03, and Plymouth (M = 3.81, SD = .95),

t (46) = 8.172, *p* <.001, 95% CI [1.00, 1.66], *d* = 1.36, but not relative to students at Bristol (*M* = 5.18, *SD* = 1.18) where the difference was non-significant, *t* (46) = -.175, *p* =.862, 95% CI [-.45, .38], *d* = .04 (Figure 3.3).

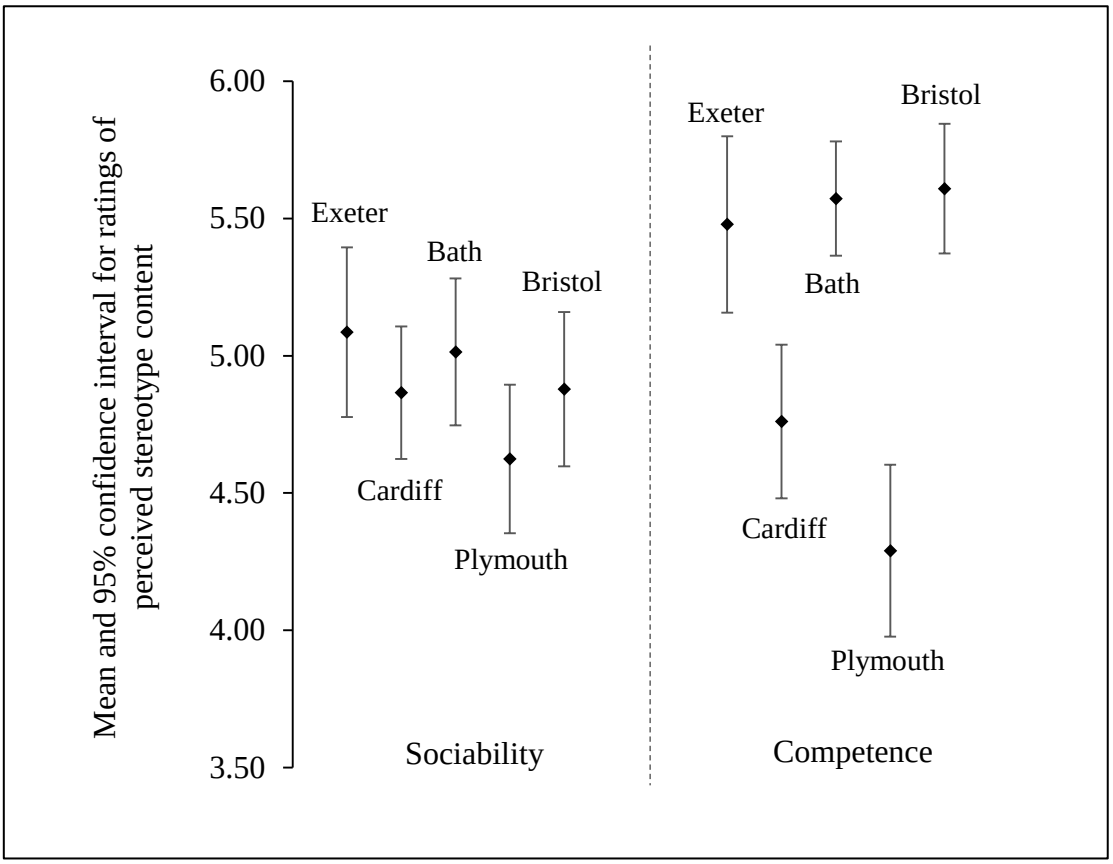

Figure 3.2. Mean ratings of sociability and competence per target group from Chapter 3, Study 1. Error bars depict the 95% confidence intervals

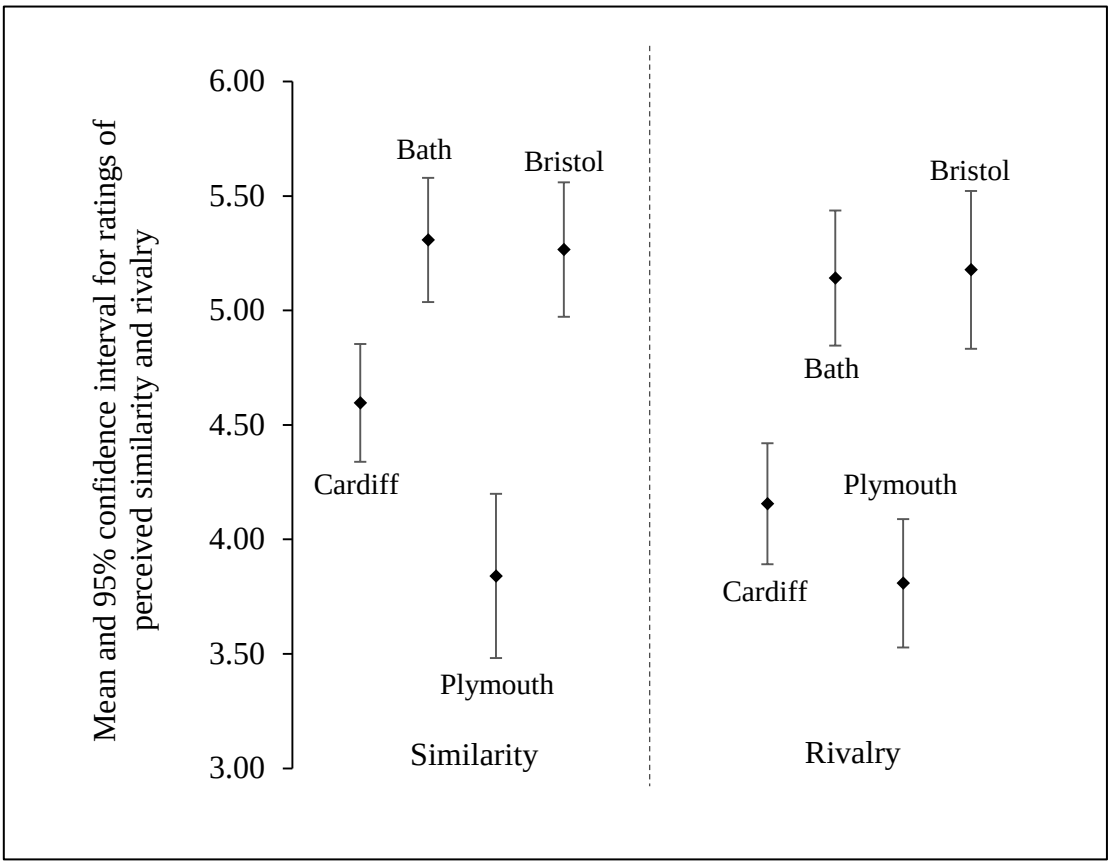

Figure 3.3. Mean ratings of similarity and rivalry per target group from Chapter 3, Study 1. Error bars depict the 95% confidence intervals

Table 3.1. Summary of means, standard deviations, and correlations for scores on perceived competence, sociability, status, similarity with the ingroup, rivalry with the ingroup from Chapter 3, Study 1.

Exeter						
Measure	*M*	*SD*	*1*	*2*	*3*	
1. Competence	5.48	1.08	—			
2. Sociability	5.09	1.05	.67**	—		
3. Status	5.39	1.12	.78**	.46**	—	
Cardiff						
Measure	*M*	*SD*	*1*	*2*	*3*	*4*
1. Competence	4.47	0.94	—			
2. Sociability	4.87	0.82	.37*	—		
3. Status	4.43	1.03	.74**	.41**	—	
4. Similarity	4.59	0.88	.26	.22	.44**	—
5. Rivalry	4.16	0.90	.14	.11	.35*	.29*
Bath						
Measure	*M*	*SD*	*1*	*2*	*3*	*4*
1. Competence	5.57	0.7	—			
2. Sociability	5.01	0.91	.42**	—		
3. Status	5.42	0.86	.77**	.31*	—	
4. Similarity	5.31	0.92	.53**	.13	.62**	—
5. Rivalry	5.14	1.00	.54**	.23	.51**	.31*
Plymouth						
Measure	*M*	*SD*	*1*	*2*	*3*	*4*
1. Competence	4.29	1.05	—			
2. Sociability	4.62	0.92	.79**	—		
3. Status	3.71	1.14	.84**	.63**	—	
4. Similarity	3.84	1.22	.67**	.48**	.77**	—
5. Rivalry	3.81	0.95	.59**	.51**	.67**	.59**
Bristol						
Measure	*M*	*SD*	*1*	*2*	*3*	*4*
1. Competence	5.61	0.79	—			
2. Sociability	4.88	0.96	.67**	—		
3. Status	5.41	1.02	.82**	.59**	—	
4. Similarity	5.27	0.99	.65**	.32*	.73**	—
5. Rivalry	5.18	1.18	.68**	.38**	.71**	.78**

Note: ** correlation is significant at the 0.01 level and * is significant at the 0.05 level (2-tailed)

3.1.3 Discussion

The goal of Study 1 was to select groups (universities) that could function as an outgroup to the ingroup (the University of Exeter) and that differed in how they are perceived by participants (i.e., students at Exeter). Participants were asked to rate the ingroup as well as a selection of outgroups that shared a background of similarity with the ingroup, on a range of attributes that are relevant to intergroup relations and have been shown as key dimensions of intergroup empathic bias. Participants were all students from the University of Exeter and I ensured that the salient ingroup comprised fellow students at the University of Exeter. The outgroups comprised students from a variety of other universities that were geographically similar to the ingroup, but varied in category-relevant dimensions relative to the ingroup and to each other (such as university rankings and entry requirements). The ultimate goal was to establish whether university affiliation would produce a context in which I might elicit and study intergroup empathic bias.

The results demonstrated that participants reported an ingroup bias on measures of perceived competence and sociability, rating their own university as highest, or equally highest, in both attributes. Participants also showed a consistent tendency to rate two of the outgroups (students from Bath and Bristol) as equal to each other and on par with the ingroup in terms of competence and status, relative to the other outgroups. Participants also rated members of these two particular outgroups as highly similar and as greater rivals to the ingroup, relative to the other outgroups. This demonstrated that some of the outgroups were not perceived to be equal to the ingroup and the outgroups themselves were not all rated as equal to each other.

The goal of Study 2 was to test whether self-reported empathy for targets in pain would differ according to their ostensible membership to one of the social groups examined in Study 1. Previous research has demonstrated that participants feel more empathy for

targets with whom they share a social categorisation (i.e., ingroup members) compared to targets with whom they don't (i.e., outgroup members; Tarrant et al., 2009). Therefore, I expected participants would report feeling more empathy for targets from the ingroup university (Exeter) compared to targets of any of the outgroup universities. Crucial to this thesis, empathy also differs according to how particular groups are perceived along dimensions of stereotype content (Cikara & Fiske, 2011) and competitive threat (Cikara et al., 2014). Given that these dimensions are key drivers of intergroup empathic bias, I expected that participants would report less empathy for students at a university that is perceived to be more of a salient competitor to students at the University of Exeter (in this case, students from Bath and Bristol), compared to students at a university that is not seen as a competitor (students from Plymouth and Cardiff).

3.2 Study 2

The goal of Study 2 was to examine whether the groups used in Study 1 would elicit empathic biases in self-reported experience-sharing.

3.2.1 Method

Design. This study followed a 2 (event: painful vs. neutral) x 5 (university affiliation: Exeter vs. Cardiff vs. Bath vs. Plymouth vs. Bath) x 2 (target occupation: student vs. worker) [2] repeated measures design.

Sample size, statistical power, and precision. Using sample data from previously published research in social categorisation and empathy (Tarrant et al., 2009), an a-priori power analysis (G* Power [Version 3.1], Faul, Erdfelder, Buchner, & Lang, 2009)

[2]Aside from allowing me to conceal the goals of the study, manipulating the target's occupation allowed me to consider whether empathic biases would emerge when comparing students versus workers. Empathic bias was particularly expected when comparing empathic responses to students relative to workers within the ingroup university, since only then did workers constitute a relevant outgroup. Workers at other universities did not constitute a relevant outgroup for our participants, so I did not expect empathy to be reduced for those targets.

demonstrated that to reach a minimum of 80% estimated power, under a two-tailed hypothesis and a confidence level of 5%, would require a sample of at least 40 participants in total for a repeated measures design. We therefore aimed to collect data from 40 participants for this study.

Participants. A total of 41 first and second year Psychology students from the University of Exeter (M_{age} = 19.68, SD = .81, 30 female) were recruited to complete a computer task in individual lab sessions. These sessions took place in the middle of the second-term of the academic year. Participants were recruited via the online Psychology Research Participation System (SONA) and remunerated with either £3 or 1 course credit, according to their preference. The study was approved by the Ethics Committee of the School of Psychology, University of Exeter. Participant consent was obtained according to the Declaration of Helsinki (World Medical Association, 2013).

Stimuli. Participants viewed photos of individuals who were denoted as either ingroup members or outgroup members experiencing painful or neutral events (Figure 4.3Figure *4*B). Information about the target's identity was presented in advance of the event[3]. The nature of the event was manipulated using either objects that can cause pain (Figure 4.3C, upper row) or neutral objects (Figure 4.3C, lower row). Objects across the two categories were semantically matched as closely as possible, for example, a Q-tip and syringe are both used to prepare a part of the body for surgery: A Q-tip to clean the area and a syringe to provide anaesthetic. The event animations consisted of 2-frame sequences of photographs (Figure 4.3A). The first frame (500ms) showed a face and hand/arm in neutral position beside an object. In half of the sequences, the object was one of three harmful objects (Figure 4.3C, upper row) and in the other it was one of three semantically matched neutral objects (Figure

[3] Within each condition, the target's identity was held constant throughout the study to ensure that the social identity would not be perceived as transient or arbitrary.

4.3C, lower row). The second frame (500ms) showed the object stimulating the hand resulting in either a painful or neutral facial expression. No inter-stimulus interval was used in order to create apparent motion. This paradigm was inspired by one used by Morrison and colleagues (2013) however has a number of substantial changes (for example, orientation of the perceived hand and the addition of the target's face) and, for the first time here, is applied to a task involving empathy. Stimuli were created using 20 photographs of faces (10 male, 10 female) adapted from the pain expressions image set in the Psychological Image Collection (PICS; pics.stir.ac.uk) and photographs of hands and arms (1 male and 1 female) that were created for this purpose. The images of hands and arms were coded to appear in an allocentric perspective to depict a target sitting opposite, and facing, the participant. All photographs were created or edited using GNU Image Manipulation Program version 2.0 (The GIMP team). The photographs were matched for dimension, orientation, perceived age, and race. All stimuli were presented using E-Prime 2.0 software (Psychology Software Tools, Pittsburgh, PA) on an 800x600 LCD monitor.

Measures. Following each event, participants were asked to identify the target (e.g., 'is this a student of Cardiff University', response alternatives: Yes or no) and to respond to two empathy-related items: 'How unpleasant was the event for you to witness?' (Self-focussed) and 'How bad did you feel for the target?' (Other-focussed). Responses were made on five-point scales (from 1 = Not at all, to 5 = Very much). After completing the main task, participants were asked to answer a series of questions designed to gauge their feedback on the paradigm (e.g., to what extent were the events realistic? Did the facial expressions appear to genuinely express pain?).

Procedure. After providing informed consent, participants were presented with a set of 10 practice trials followed by a short break in which participants were given the opportunity to request clarification of any aspects of the task that may be unclear to them. In

the task itself, participants were asked to observe and respond to photographs of individuals from different universities, some that depicted people experiencing negative events (e.g., an injection). At the onset of each trial, participants were required to memorise the target's identity (i.e., a student or a worker from one the target universities). Participants then observed that same target experiencing either a neutral or painful event. Following this, participants were asked to recall the identity of the target in a simple 1-back task. Finally, participants were asked to respond to two questions gauging their self- and other-focussed empathy towards the target of that event. Participants completed 120 trials in total: 50% depicted painful events (60), 50% depicted students (60), and 20% per university (24). After completing 120 trials, participants were debriefed on the background and purpose of the study, remunerated, and given the opportunity to ask questions.

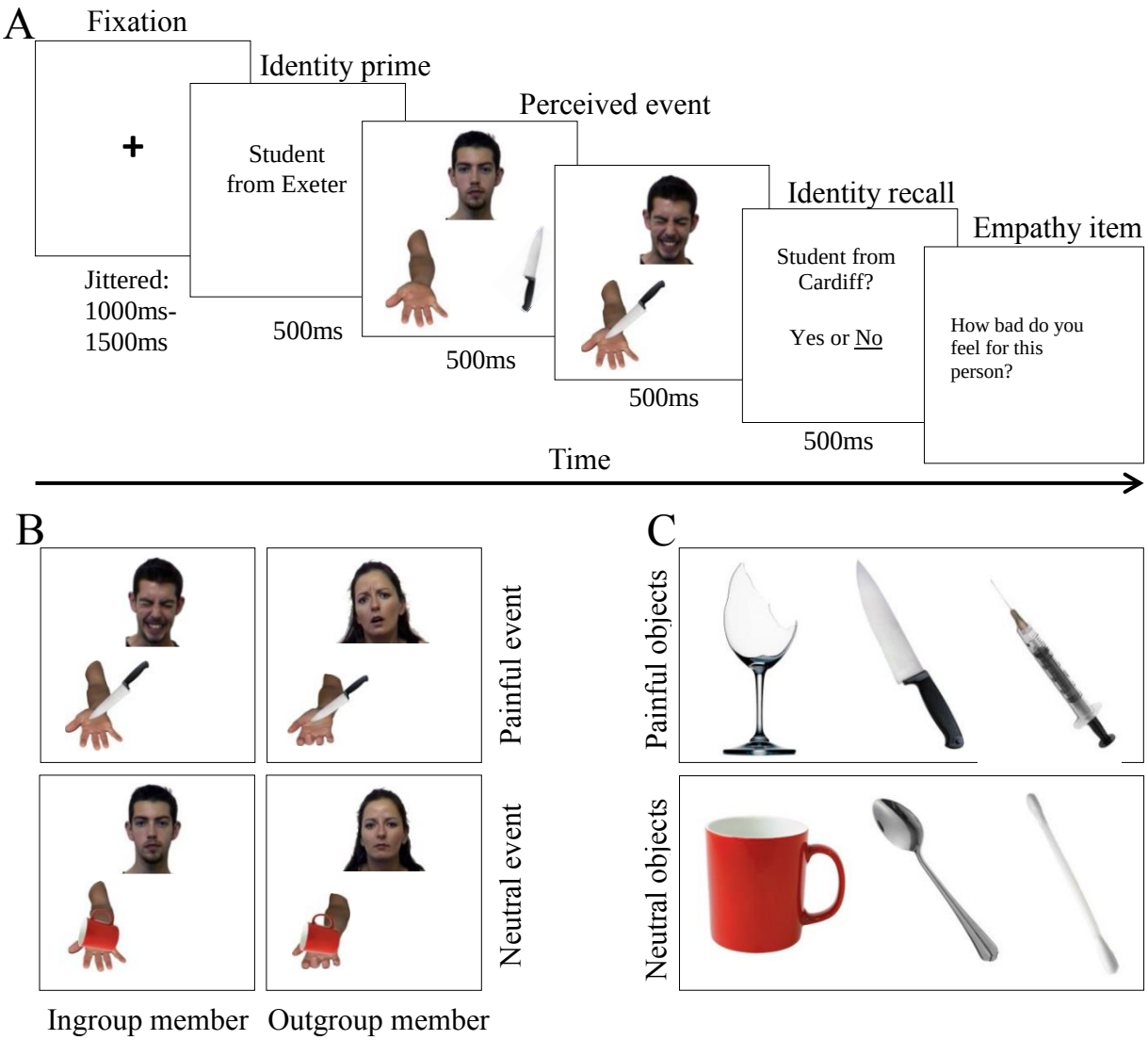

Figure 4.3. (A) Trial structure; (B) Example of the four possible events from the combination of the object types (painful and neutral) and the target group membership (ingroup and outgroup); (C) Object stimuli depicted as causing either painful or neutral stimulations to the target.

3.2.2 Results

Recall task. Participants were on average 86% accurate at correctly recalling the target's identity, which did not differ according to the perceived events, F (1, 39) = .405, p =.528, η_p^2 = .01, target occupation, F (1, 39) = .570, p =.455, η_p^2 = .01, or target group, F (1, 39) = .846, p =.498, η_p^2 = .02. One participant consistently scored below 3 standard deviations from the mean (scoring 50.5% on average) and was thus removed from further

analysis. Of the remaining sample, only trials in which participants correctly recalled the target were analysed. This ensures that the trials analysed are those where the identity was correctly identified.

Self-focussed empathy. A repeated measures analysis of variance revealed a significant main effect of the perceived event on ratings of self-focussed empathy, F (1, 39) = 216.03, p <.001, η_p^2 = .84. Participants reported painful events (M = 3.51, SD =.13) to be more unpleasant to witness compared to neutral events (M = 1.32, SD = .07), t (39) = 14.69, p < .001, 95% CI [1.89, 2.49], d = 20.98. This confirms that participants perceived the events as intended.

I observed floor effects in empathic responses to neutral trials with no variability between the target groups, F (4, 156) =.717, p =.581, η_p^2 = .02. This was to be expected given that the neutral events did not involve pain, which is what participants were required to rate. Therefore the decision was made to analyse the effects of group categorisation on empathy only using trials that would invoke empathy (i.e., trials involving pain). This analysis revealed a significant main effect of target group, F (4, 156) = 3.59, p =.008, η_p^2 = .08, which was explained only by the difference in ratings between targets from Bath (M = 3.43, SD =.13) and Bristol (M = 3.59, SD =.13), t (39) = -2.95, p = .05, 95% CI [-.34, .06], d = 1.23.

There was no main effect of target occupation, F (4, 156) = 2.72, p =.107, η_p^2 = .06, but there was a significant interaction between occupation and group, F (4, 156) = 5.02, p =.001, η_p^2 = .11. Participants reported photographs of pain to seem more unpleasant when the target was a worker, compared to a student, at Cardiff, t (39) = 2.23, p = .031, 95% CI [.02, .29], d = .15, and Plymouth, t (39) = 2.87, p = .007, 95% CI [.05, .29], d = .17, whereas they reported them to be significantly less unpleasant when the target was a worker, compared to a student, at the ingroup university, t (39) = -3.18, p = .003, 95% CI [-.26, -.06], d = .19.

There was no difference in unpleasantness ratings for targets who were workers compared to students at Bath, t (39) = .981, p = .337, 95% CI [-.06, .16], d = .05, and Bristol, t (39) = .108, p = .921, 95% CI [-.13, .14], d = .01.

Participants reported photographs of pain to seem more unpleasant when the target was a fellow student from Exeter (M = 3.56, SD = .83) compared to when the target was a student from Cardiff (M = 3.44, SD = .89), t (40) = 2.19, p =.034, 95% CI [.01, .23], d = .14, Bath (M = 3.40, SD = .88), t (40) = 2.61, p =.013, 95% CI [.04, .28], d = .19, or Plymouth (M = 3.43, SD = .87), t (40) = 2.35, p =.024, 95% CI [.02, .26], d = .15, but not when the target was a student from Bristol (M = 3.59, SD = .88), t (40) = -.462, p =.647, 95% CI [-.17, .11], d = .04.

Other-focussed empathy. As with self-focussed empathy, a strong main effect of event emerged, F (1, 39) = 285.09, p <.001, η_p^2 = .88: Participants reported feeling worse for targets who experienced a painful event (M = 3.82, SD =.09) compared to neutral event (M = 1.35, SD = .08), t (39) = 16.87, p < .001, 95% CI [2.17, 2.76], d = 29.01.

As before, there was no effect of type of perceived event and target group, F (4, 156) =.688 p =.601, η_p^2 = .02. Analysing the effects of group categorisation on trials involving pain revealed a main effect of target group, F (4, 156) = 2.99, p =.021, η_p^2 = .07, which was, as above, explained by the difference between Bath (M = 3.75, SD =.09) and Bristol (M = 3.89, SD =.09), t (39) = -3.97, p = .003, 95% CI [-.25, -.03], d = .15.

There was a marginally significant main effect of occupation, F (1, 39) = 3.99, p =.052, η_p^2 = .09: Participants felt worse for workers compared to students overall, t (39) = -1.97, p = .052, 95% CI [-.001, .15], d = .07. A significant interaction emerged between occupation and university affiliation: Participants reported feeling worse if the target in pain was a worker, compared to a student, at Cardiff, t (39) = 2.21, p = .034, 95% CI [.01, .30], d

= .15, and Plymouth, t (39) = 3.11, p = .003, 95% CI [.07, .33], d = .19. There was no difference in unpleasantness ratings for targets who were workers, compared to students, at the ingroup university, t (39) = 1.36, p = .183, 95% CI [-.05, .23], d = .09, Bath, t (39) = 1.02, p = .319, 95% CI [-.06, .183], d = .07, or Bristol, t (39) = .662, p = .510, 95% CI [-.09, .19], d = .05.

Participants reported feeling significantly worse observing the pain of others when the target was a fellow student from Exeter (M = 3.86, SD = .57) compared to when they were a student from Cardiff (M = 3.74, SD = .69), t (40) = 1.83, p =.075, 95% CI [-.01, .25], d = .19, Bath (M = 3.72, SD = .64), t (40) = 2.75, p =.009, 95% CI [.04, .23], d = .23, or Plymouth (M = 3.71, SD = .67), t (40) = 2.39, p =.022, 95% CI [.02, .28], d = .24, but not when they were a student from Bristol (M = 3.87, SD = .67), t (40) = -.220, p =.827, 95% CI [-.13, .11], d = .02 (Figure 3.5).

Feedback questionnaire. Responses to the feedback items demonstrated that participants perceived events involving syringe needles (M = 4.02, SD = .85) to be significantly less painful compared to a kitchen knife (M = 4.78, SD = .52) or broken wine glass (M = 4.63, SD = .58), F (2, 120) = 14.79, p <.001. Descriptive statistics also demonstrated that participants generally believed that the emotions displayed by the targets represented a genuinely painful experience (M = 3.71, SD = .87).

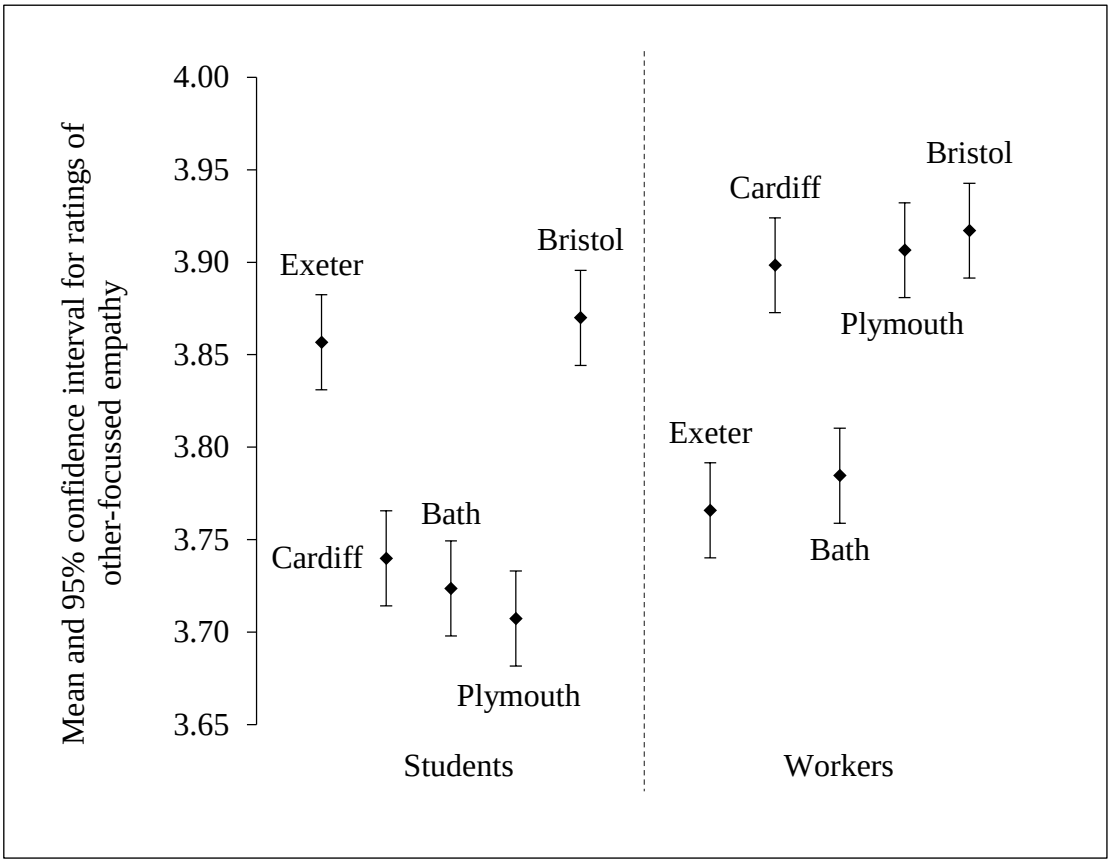

Figure 3.5. Mean ratings of other-focussed empathy per target group from Chapter 3, Study 2. Error bars depict the 95% confidence intervals

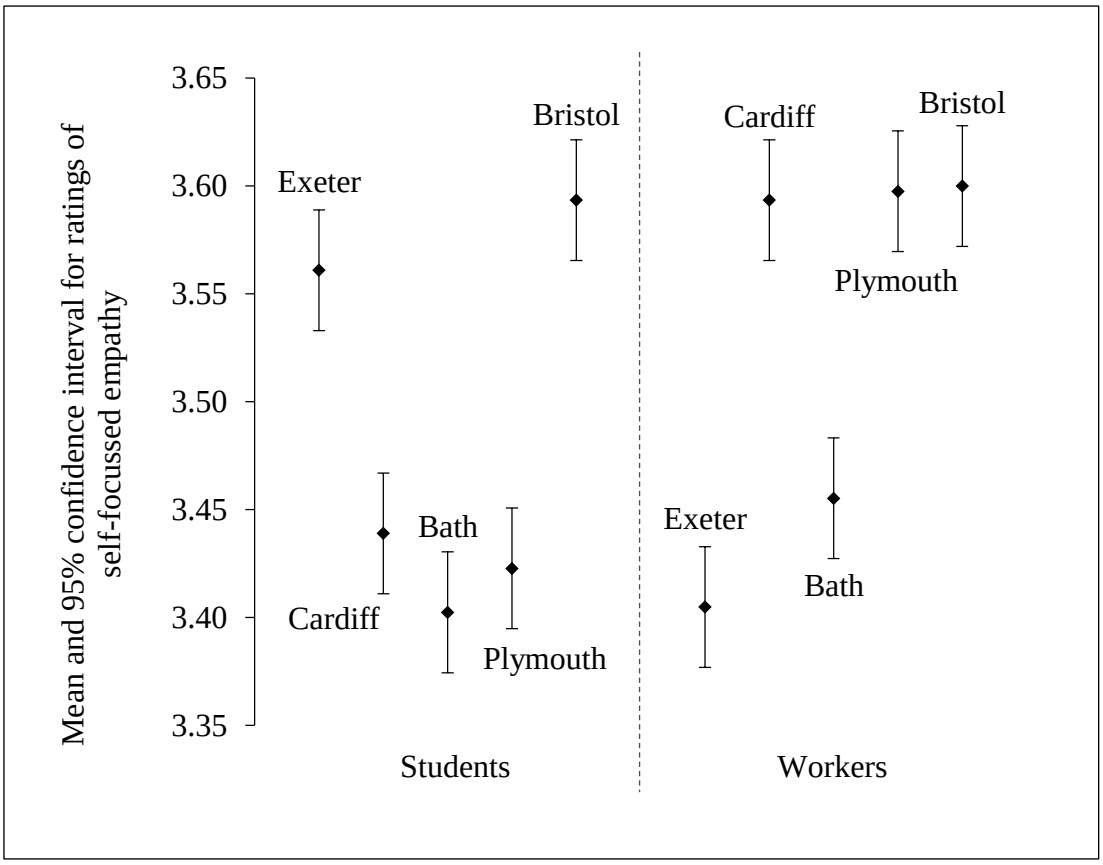

Figure 3.6. Mean ratings of self-focussed empathy per target group from Chapter 3, Study 2. Error bars depict the 95% confidence intervals

Table 3.2. Summary of means and standard deviations for scores on empathy towards Students and Worker targets from Chapter 3, Study 2

		Other-focussed		Self-focussed	
	Target Group	*M*	*SD*	*M*	*SD*
Students	Exeter	3.86	0.57	3.56	0.83
	Cardiff	3.74	0.70	3.44	0.89
	Bath	3.72	0.64	3.40	0.88
	Plymouth	3.71	0.67	3.42	0.87
	Bristol	3.87	0.67	3.59	0.88
Workers	Exeter	3.77	0.61	3.40	0.84
	Cardiff	3.90	0.56	3.59	0.82
	Bath	3.78	0.66	3.46	0.87
	Plymouth	3.91	0.57	3.60	0.77
	Bristol	3.92	0.66	3.60	0.83

3.2.3 Discussion

Previous work has demonstrated that biases in empathic concern (i.e., one specific facet of empathy) arise in group contexts that are not simply defined by an ingroup-outgroup distinction, but vary according to how particular outgroups are perceived (Cikara & Fiske, 2011). Study 2 extended those findings by demonstrating that outgroup-specific empathic biases also emerge in a task involving experience-sharing. Participants were shown target individuals experiencing painful events. The target's identity was manipulated by their university affiliation and their occupation within that university. Consistent with previous research, self-reported empathy was greater when observing ingroup targets in pain compared to observing targets of some, but not all, outgroups in pain. Specifically, as expected, ingroup bias emerged when comparing empathy ratings for students from Exeter and students from Cardiff, Bath, or Plymouth, but not when compared to ratings for students from Bristol. Instead, participants actually reported feeling slightly (but not significantly) worse seeing a Bristol student in pain than an Exeter student. This was against my expectations. In Study 1, Bristol was perceived to be a significantly more competitive with the ingroup, compared to other outgroups. Given that competition is a key dimension of intergroup empathic bias, I

expected empathy for targets from this group to be lower compared to targets from groups that were seen as less competitive with the ingroup (e.g., Plymouth).

The results of this study showed that self-reported empathy varied according to intersections between the target's university affiliation and their perceived occupation within that university. Specifically, ratings of empathy were significantly higher towards targets who shared both group categorisations with the salient ingroup (i.e., Exeter students) relative to targets who differed in one of those dimensions (i.e., a Bath student or an Exeter worker). Interestingly, ratings of empathy for targets who differed in both dimensions (i.e., workers at outgroup universities) were not statistically different from empathy reported for ingroup targets.

I demonstrate here that intergroup biases in empathy are driven by the context specific to a given ingroup-outgroup relation rather than simply an ingroup-outgroup distinction. This is consistent with previous research, but here, for the first time, I document that outgroup-specific empathic biases also emerge in experience-sharing. While these results are consistent with findings from previous studies, they suffer from the limitations that are inherent to self-report measures. Zhou, Valiente, and Eisenberg (2003) argue that self-report measures are a ubiquitous and robust method to study empathy-related responses, but that they can and often are vulnerable to strategic responding given that empathy is deemed to be socially desirable (Decety & Jackson, 2006). Indeed, significant disparities exist between the responses that participants consciously report (such as ratings on a Likert scale) and those that are uncontrollable and reflective of 'gut reactions' such as physiological responses (Paulhus & Reid, 1991; Teachman, Gapinski, Brownell, Rawlins, & Jeyaram, 2003). It is possible, in this case, that participants did not rate empathy with another's (or others') pain as they actually experienced it, but in line with their perceptions of what is socially desirable (i.e., to be empathic to all and not prejudiced by group boundaries). Therefore, in Study 3

(reported in the next chapter), I used techniques that capture responses that are not within a participant's volitional control (brain imaging measures) in conjunction with self-reports to triangulate empathic responses to another's pain. Brain activity, accessed through brain imaging, has been established to be an effective proxy to one's own experiences of pain and has been regarded as a reliable way of indexing empathic responses when triangulated with self-assessments (Robinson, Staud, & Price, 2013).

Feedback from this study indicated, overall, that this paradigm was a valid measure of experience-sharing: The stimuli appeared to genuinely depict pain (according to feedback from participants) and participants reported feeling bad or unpleasantness at the sight of it. Results also indicated ways in which I might improve the paradigm. For example, empathy-related responses were significantly reduced to images of a syringe penetrating the other's hand. While I did not include a measure to follow up on why this was, it may be intuitive given that a syringe is often used to *reduce* (rather than provoke) pain in medical contexts (i.e., delivering an anaesthetic). This is interesting when one considers the prevalence of this type of stimuli in the experience-sharing literature (for example, Xu et al., 2009). It is also consistent with previous suggestions that 'flesh and bone' penetration (such as, seeing a knife stab a hand) as opposed to light pinpricking (by a needle) leads to greater processing of another's physical pain (Avenanti, Paluello, Bufalari, & Aglioti, 2006; Morrison, Lloyd, di Pellegrino, & Roberts, 2004). For these reasons, I removed images of syringes from the paradigm used in Study 3.

From the results of Study 1 and Study 2, I identified that participants rated two outgroups, in particular, as varying the most from each other in terms of competitive threat (i.e., a key dimension of intergroup empathic bias; Cikara, Bruneau, Van Bavel, & Saxe, 2014). Those groups were students from the University of Bath and students from the University of Plymouth. In Study 1, participants consistently rated students from Bath as the

highest in terms of perceived competence and status; the most similar and the greatest rivals of students from the ingroup university. In contrast, students from Plymouth were rated as the lowest in every dimension when compared to the ingroup and other outgroups. In Study 2, there were no significant differences when comparing empathic towards targets from Bath and Plymouth, but it is possible that these biases would emerge when measuring responses without the filter of response control. Therefore, in Study 3, I investigated whether outgroup-specific empathic biases emerge in responses that are not subject to social desirability (brain imaging measures). I expected that participants would exhibit less empathy-related brain activity in response to targets whose group is perceived as more competitive with the ingroup (i.e., students from the University of Bath) compared targets whose group is seen as less competitive (i.e., students from the University of Plymouth).

3.3 Conclusion

In this chapter, I have outlined how I developed a paradigm to test the hypothesis that empathic biases arise as a result of how an outgroup is perceived in relation to the ingroup rather than simply on the basis of an ingroup-outgroup distinction. I have outlined the issues in the literature, as I see them, and highlighted how I accounted for these issues in my approach. I then presented two studies in which I measured responses to a selection of target groups on a range of attributes that have been shown as key dimensions of intergroup empathic bias (Study 1). I also tested the appropriateness of the selected intergroup contexts to examine empathic biases (Study 2). With these studies, I demonstrated that some of the outgroups were not perceived to be equal to the ingroup and the outgroups themselves were not all rated as equal to each other (Study 1). This suggests that university affiliation could be used to produce a context in which to elicit and study intergroup empathic bias. I then demonstrated that self-reported empathy was greater when observing ingroup targets in pain compared to observing targets of some, but not all, outgroups in pain (Study 2). This supports

the notion that biases in empathy are driven by the context specific to a given ingroup-outgroup relation rather than simply an ingroup-outgroup distinction.

In Chapter 4, I report two studies in which participants were given a task involving experience-sharing for members of different groups while their neural responses were recorded via functional magnetic resonance imaging (fMRI).

4 The Neural Correlates of Context-Specific Empathic Biases

The goal of Chapter 3 was to demonstrate that intergroup biases influence empathy at a self-report empathy level and that these biases are driven by the context specific to a given ingroup-outgroup relation (such as the beliefs about a group) rather than simply an ingroup-outgroup distinction. The goal of Chapter 4 was to show that the same context-specific biases influence empathy at a neurological level, where the filter of response control is removed and where intergroup biases are thus more prominently exhibited.

Individuals feel more empathy for those in their group (i.e., ingroup members) and less for those who are not (i.e., outgroup members)—this is referred to as empathic bias. Using self-report ratings, researchers have shown that empathic bias can manifest at varying degrees from ambivalence when presented with the suffering of an outgroup member (Stürmer et al., 2005; Tarrant et al., 2009) to malicious pleasure (i.e., Schadenfreude; Cikara, Botvinick, & Fiske, 2011; Leach, Spears, Branscombe, & Doosje, 2003). Empathic bias can also manifest at the level of neural activity: Xu, Zuo, Wang, and Han (2009) found that participants exhibited stronger blood oxygenation level dependent (BOLD) responses associated with empathy when viewing same-race, compared to other-race, targets in physical pain. But empathy is not merely selective to the other's group, rather it fluctuates according to how the other's group is perceived by the individual.

At the self-report level, the extent to which we feel ambivalence or joy to an outgroup member's pain is determined by whether or not we perceive the outgroup as a possible rival to the ingroup (Chang et al., 2016; Cikara et al., 2014). Likewise, the BOLD responses associated with empathy also depend on how the outgroup is evaluated by the participant: Cikara and Fiske (2011) found that the insula (a region that is strongly associated with empathy; Lamm, Decety, & Singer, 2011) was more active when reading about enivable targets experiencing positive events than if the event was negative or if the target was

typically pitied, admired, or contemptible. Given the insula's involvement in processing the sensory-discriminative aspects of pain (Peyron et al., 2000), the authors interpreted this activation as indicative of a counter-empathic response (i.e., that seeing envied targets experiencing positive events was in some way painful for the participant). With these results, Cikara and Fiske showed for the first time that BOLD responses associated with empathy are not simply modulated by ingroup-outgroup distinctions, but rather vary as a function of how the outgroup is evaluated by the individual.

Consistent with the findings from Cikara and Fiske (2011), recent research has demonstrated that BOLD responses are modulated by beliefs about the outgroup that relate to intergroup relations, such as whether or not the outgroup is perceived to be a rival to the ingroup (Cikara, Botvinick, & Fiske, 2011; Hein, Silani, Preuschoff, Batson, & Singer, 2010) or is higher status than the ingroup (Feng et al., 2016). However, one of the key limitations of this research is that empathy is measured in relation to an ingroup and single outgroup (i.e., 'us' vs. 'them'), not multiple outgroups to which the ingroup might relate differently (i.e., 'us' vs. competitive 'them' vs. non-competitive 'them'). To determine whether or not empathic bias emerges according to how relevant a threat an outgroup is to the ingroup, it is necessary to compare empathic responses not only between the ingroup and an outgroup but also between different outgroups.

The goal of Study 3 was to determine whether beliefs about an outgroup can drive biases in the BOLD responses associated with empathy. Cikara and Fiske (2011) showed that beliefs about another's group influenced BOLD responses associated with one specific facet of empathy, empathic concern, but it is unclear whether this effect would also influence activation associated with other facets of empathy, such as experience sharing. Brain activation is not only interesting in itself—as it can shed light on the mechanisms through which group biases emerge—but it also allows us to access responses that respondents cannot

control, which is especially important when examining morally loaded responses, such as empathy. In Study 3, I asked participants to observe targets from either the ingroup university or one of two neighbouring outgroup universities as they experienced physically painful or innocuous events. Participants were asked to rate the extent to which they felt empathy towards the targets while their BOLD responses were recorded via functional magnetic resonance imaging (fMRI). Based on a recent meta-analysis, I expected that observing pictures of other's pain would lead to increased activation in regions that process the sensory-discriminative aspects of pain, such as the anterior insula (AI), and primary and secondary somatosensory cortices (SI and SII); the felt unpleasantness of physical pain, such as the anterior cingulate (ACC); and areas engaged in the inference and representation of mental states, such as the medial prefrontal cortex (mPFC) and temporoparietal junction (TPJ; Lamm et al., 2011).

I expected activity in these regions would be modulated by the group identity of the target, but more specifically by the participant's beliefs about the target's group. In support of these predictions, a recent study by Feng et al. (2016) demonstrated that participants exhibited more activity in the AI and anterior medial cingulate cortex (aMCC) when the target in pain was a member of a low, compared to a high status, outgroup. Contrary to this, Molenberghs et al. (2014) found that group membership had no effect on activation in the ACC or AI. However, these researchers did not measure how the outgroup was perceived by the participants; therefore it is not possible to rule out whether participants perceived the outgroup as a relevant rival to the ingroup—which is crucial for the emergence of intergroup empathic bias (Cikara et al., 2014).

In Study 3, I included items to measure participants' perceptions of the groups on a range of attributes that have been shown to be important for intergroup relations and as key drivers of intergroup empathic bias including stereotype content (Cikara & Fiske, 2011) and

competitive threat (Cikara et al., 2014). I expected that activation in regions associated with empathy for pain (ACC and AI) and other processes related to empathy (i.e., mentalising; mPFC) would be attenuated while observing outgroup targets in pain compared to ingroup targets in pain. Crucially, however, I expected that this effect would be qualified by the extent to which the outgroup is perceived to be a rival to the ingroup, such that there would be less empathy-related activity in response to targets from the relatively more competitive outgroup than to targets from the relatively less competitive outgroup.

4.1 Study 3

4.1.1 Method

Design. The study followed a 2 (event: painful vs. neutral) x 3 (target identity: Exeter vs. Bath vs. Plymouth)[4] repeated measures design, with both factors varied within participants.

Participants. An a-priori power analysis (G* Power [Version 3.1], Faul, Erdfelder, Buchner, & Lang, 2009) demonstrated that to reach a minimum of 80% estimated power, under a two-tailed hypothesis and a confidence level of 5%, would require a sample of at least 40 participants in total for a repeated measures design. We therefore aimed to collect data from 40 participants for this study. A total of 40 healthy volunteers—with no reported history of psychiatric or neurological disorders, and no current use of any psychoactive medications—were recruited from the University of Exeter and remunerated with £10 for their time. Data from one participant was excluded from the analysis due to artefacts during co-registration of the anatomical scans to a standard Montreal Neurological Institute (MNI) space, leaving 39 participants (M_{age} = 19.25, SD = 1.24, 26 female, all right-handed). The

[4] The ingroup was the university where the study was conducted (University of Exeter).The two outgroups were expected to differ in terms of perceived similarity to and rivalry with the ingroup: University of Bath perceived as more similar/competitive towards the ingroup than University of Plymouth (which at the time of testing was ranked 71st in the UK overall, compared to Exeter at 10th and Bath at 9th; CUG, 2014).

study was approved by both the Ethics Committee of the School of Psychology, University of Exeter, and the UK Ministry of Defence Ethics Committee. Participant consent was obtained according to the Declaration of Helsinki (World Medical Association, 2013).

Stimuli. Details of the stimuli and paradigm can be found in Chapter 3 (under Study 2, Stimuli). The duration of the fixation was randomly jittered (between 1000-1500 ms) and inter-stimulus intervals (ISIs) were placed on either side of the animation, given a random duration between 250-1750 ms (with the second ISI occupying the remaining time to amount 2000 ms for both ISIs overall per trial), thus equating a 'stochastic' design (K. Friston, Zarahn, Josephs, Henson, & Dale, 1999). A total of 96 trials, 50% depicting painful events (48), and 33% per university (32), each lasting 10 seconds, were presented in a single run. A new sequence of trials and timings was randomly generated for each participant. All stimuli were presented using E-Prime 2.0 software (Psychology Software Tools, Pittsburgh, PA) on an 800x600 LCD monitor.

Measures. Participants completed self-report measures of perceived group competence (all alphas > .90), sociability (all alphas > .90), status (all alphas > .80), rivalry (all alphas > .80), and similarity (all alphas > .90), in relation to all three groups (universities) included in the study. Participants also completed the interpersonal reactivity index (IRI; Davis, 1980).[5]

Procedure. After providing written informed consent and observing safety protocols (see Appendix C), participants were guided to the scanner and read standardised instructions via the digital projector system (Epson EMP-74). Participants completed 15 practice trials during the structural scan. In the task itself, participants observed individuals experiencing neutral or painful events. At the onset of each trial, participants were required to memorise

[5] This data is discussed in Chapter 6 as part of a broader secondary analysis on dispositional empathy and individual differences and is thus not reported in this Chapter.

the target's identity (i.e., a student from one of the target universities). Participants then observed the target experiencing either a neutral or painful event. Following this, participants were asked to recall the identity of the target in a simple 1-back task. Finally, participants were asked to respond to items gauging their other-focussed empathy towards the target of that event. Responses were made using a 100 point visual analogue scale (VAS) with a response button-box (4-channel bimanual). This VAS was anchored in the same way as a 7-point Likert scale (1 = Not at all to 7 = Very much), but allowed participants to score anywhere between those 7 points. After this, participants left the scanner and were asked to provide their self-reported impressions of the groups on 7-point Likert scales. At completion, participants were debriefed on the background and purpose of the study and given the opportunity to ask questions.

fMRI image acquisition. Scanning was performed on a 1.5T Philips Gyroscan (SENSE-Head-8 coil) magnet at the University of Exeter MR centre, UK. Images sensitive to blood oxygenation level dependent (BOLD) contrast were acquired using a T2* weighted gradient echo planar imaging (EPI) sequence (TR = 3000ms, TE = 45, flip angle = 90°, matrix = 80 x 80m, voxel size = 3 x 3 x 3mm, 25mm min slice gap, ascending acquisition) and 520 volumes were acquired per participant. For each participant, functional data were overlaid on a high-resolution T1-weighted anatomical image for registration into standard space and functional localisation (3D T1 FFE, TR = 252 ms, TE = 4.2 ms, voxel size = $0.9mm^3$, slices = 160, FOV = 230 mm, Flip angle = 30º).

fMRI data analysis. Pre-processing and statistical analysis of functional images was performed using FMRIBs Expert Analysis Tool (FEAT; FMRIB Software Library, release 5.0, 2012). For each individual participant, standard pre-processing steps were performed. These were: Motion correction (Jenkinson, Bannister, Brady, & Smith, 2002), removal of non-brain tissue (S. M. Smith, 2002), spatial smoothing (using a Gaussian kernel of FWHM

5mm), normalisation based on grand-mean intensity, and high-pass temporal filtering (Gaussian-weighted least-squares straight line fitting, with sigma=50.0s). Registration of functional data to high-resolution T1 structural images and subsequently to Montreal Neurological Institute standardised space was carried out using FMRIB's Linear Image Registration Tool (MCFLIRT; Jenkinson & Smith, 2001). Anatomical locations were determined in the first instance by the Harvard-Oxford anatomical atlas provided with FSL and, in the case of ambiguity, a more detailed paper and digital brain atlas (Mai, Voss, & Paxinos, 2008).

First level, single-participant analyses were performed using a general linear model with local autocorrelation correction (Woolrich, Ripley, Brady, & Smith, 2001). Each trial was modelled from the onset of the first frame of the animation for a duration of 2 seconds (i.e., until the end of the animation). A design matrix was fitted for each participant with 6 task-related regressors, one for each condition of the 2 x 3 factorial design as well as a regressor for the motion parameters of each orthogonal axis (i.e., to control for head movement; Jenkinson et al., 2002). Main effects of event (PainExeter + PainPlymouth + PainBath > NeutralExeter + NeutralPlymouth + NeutralBath) were evaluated to demonstrate whether or not the task engaged empathy-related brain areas. I tested the main effect of target identity (PainExeter + NeutralExeter > PainPlymouth + NeutralPlymouth > PainBath + NeutralBath) and interaction effects between event and target identity. Specifically, I constrained the linear model to test the *a priori* hypothesis (which was derived from the pattern of results from Study 2, Chapter 3) that empathy-related activations would be larger while observing targets from the ingroup and the relatively less competitive outgroup in pain, than targets from the relatively more competitive outgroup in pain [(PainExeter > PainPlymouth > PainBath) + (NeutralBath > NeutralPlymouth > NeutralExeter)]. Higher level analyses were carried out using FLAME stage 1 (Beckmann, Jenkinson, & Smith, 2003;

Woolrich, Behrens, Beckmann, Jenkinson, & Smith, 2004). Corrections for multiple comparisons were conducted at the cluster level using Gaussian Random field theory ($z > 2.3$, $p < .05$, corrected) (Worsley, 2001).

Region of interest analysis. Initially, I examined the effects of target identity across the brain by running the main and interaction contrasts at the whole-brain level. I tested my *a-priori* hypotheses regarding activation in the AI, ACC, and mPFC, by conducting planned analyses using functionally defined regions of interests (ROIs). Functional ROIs were defined using the painful > neutral events contrast, collapsed across target identity. To look at differences in activation between the target identities, I extracted the mean percentage signal change in BOLD by expanding a 10 mm radial sphere from the peak voxel of each significant region in the pain > neutral contrast image. To avoid issues of non-independence, I extracted data from the individual regressors from the first level analysis (and not from contrasts between target identities) using the Featquery tool in FSL. With these, I used SPSS (IBM SPSS Statistics for Windows, version 22.0. Armonk, NY: IBM Corp) to conduct within-group analyses comparing the mean percentage signal change between the target identities.

4.1.2 Results

Self-report ratings. I have reported the results of the group perception measures first in order to serve as a manipulation check and to establish the context in which participants responded to the different target groups—although during testing the group perception measures were completed last.

Competence and sociability. There was a significant main effect of target identity in perceived competence, F (2, 78) = 109.91, MSE = 25.49, p <.001, η^2 = .74. Participants rated students from the ingroup as significantly more competent (M = 5.86, SD = .67) than students at Plymouth (M = 4.35, SD = .88), t (39) = 13.23, p <.001, 95% CI [1.22, 1.79], d = 1.93, and

Bath (M = 5.56, SD = .59), t (39) = 3.26, p = .007, 95% CI [.07, .53], d = .48. Students at Bath were perceived to be significantly more competent than students at Plymouth t (39) = 10.50, p <.001, 95% CI [.92, 1.49], d = 1.62. There was no difference in the perceived sociability of the target groups, F (2, 78) = 1.98, MSE = .407, p= .144, η^2 = .048 (Figure 4.6).

Status. Participants rated the perceived status of the target groups in a manner similar to their ratings of perceived group competence, F (2, 78) = 80.68, MSE = .687, p < .001, η^2 = .67: While participants rated students from Exeter (M = 5.59, SD =.79) and Bath (M = 5.66, SD = .92) as equal in status, t (39) = -.42, p =.69, 95% CI [-.44, .31], d = .08, they rated students at Plymouth (M = 3.59, SD = 1.06) to be significantly lower in status compared to Exeter, t (39) = -9.12, p <.001, 95% CI [-2.46, -1.56], d = 2.14, and Bath, t (39) = -9.40, p <.001, 95% CI [-2.62, -1.52], d = 2.09.

Similarity and rivalry. Students from Bath (M = 5.40, SD = 1.17) were perceived to be significantly more similar to the ingroup, compared to students from Plymouth (M = 3.34, SD = 1.05), t (39) = 8.23, p <.001, 95% CI [1.55, 2.56], d = 1.85. Students from Bath (M = 4.74, SD = .96) were also perceived to be significantly more competitive with the ingroup, compared to students from Plymouth (M = 4.13, SD = 1.17), t (39) = 2.68, p =.011, 95% CI [.15, 1.08], d = .57.

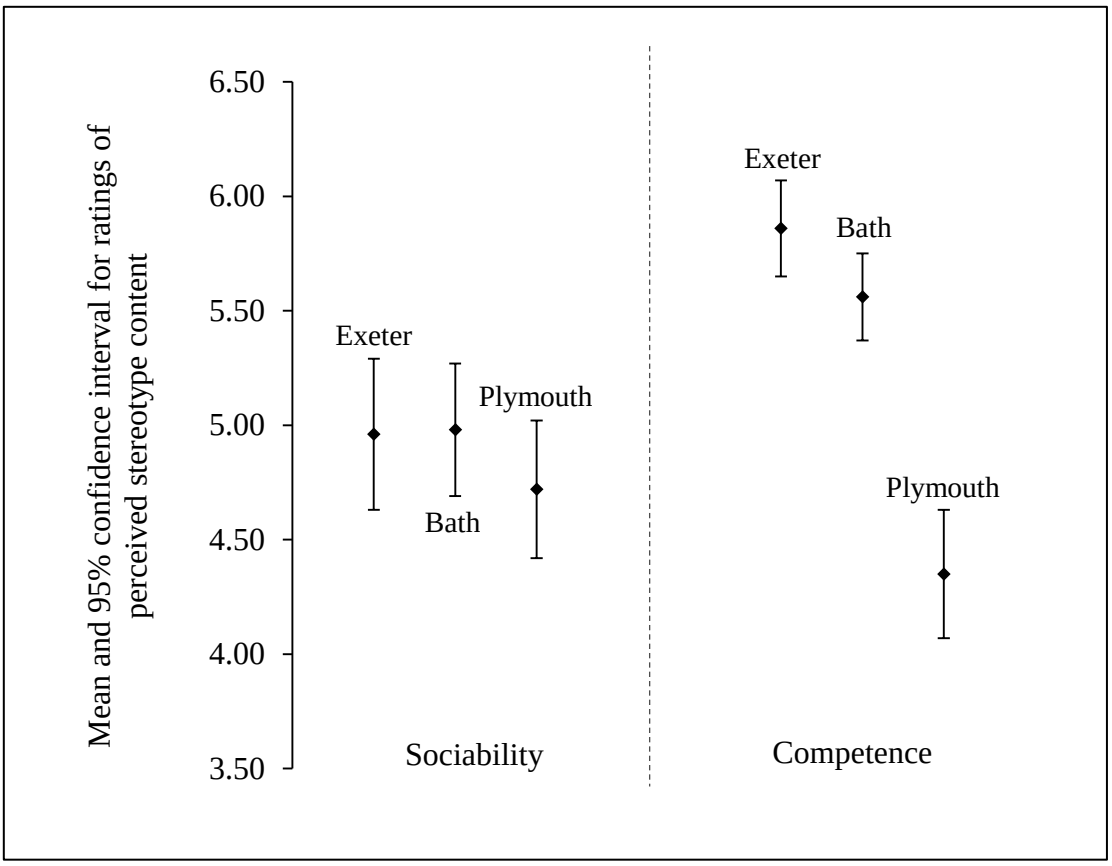

Figure 4.6. Mean ratings of sociability and competence per target group from Chapter 4, Study 3. Error bars depict the 95% confidence intervals

Self-reported empathy. A repeated measures analysis of variance revealed a significant main effect of the perceived event on ratings of other-focussed empathy, F (1, 39) = 523.89, MSE = 598.42, p <.001, η^2 =.93. Participants reported feeling worse for targets who experienced a painful event (M = 78.53, SD = 2.91) compared to a neutral event (M = 6.24, SD = 1.30), t (39) = 22.89, p < .001, 95% CI [65.89, 78.67], d = 32.08. There was a marginally significant main effect of target identity, F (2, 78) = 3.06, MSE = 12.39, p =.053, η^2 = .07. Participants reported significantly more empathy for ingroup targets (M = 79.65, SD = 18.52) compared to students from Bath (M = 77.95, SD = 19.07), t (39) = 2.69, p = .03, 95% CI [.13, 3.28], d = .09, but not more compared to students from Plymouth (M = 77.98, SD = 18.28), t (39) = 1.95, p = .176, 95% CI [-.48, 3.81], d = .09. There was no difference in self-reported empathy between the two outgroups, t (39) = -0.41, p =.97, 95%

CI [-2.17, 2.09], d = .001. There was no significant interaction between the event and the target identity, F (2, 78) = 1.64, MSE = 15.08, p =.20, η^2 = .04.

fMRI results. At the whole brain level, participants exhibited greater activation in the peak clusters of the medial prefrontal cortex (Montreal Neurological Institute coordinates: 2, 60, 18) and the anterior insula (MNI coordinates = 48, 24, -16) while observing painful, compared to neutral, events (see Figure 4.7 and Table 4.1). There was also a main effect of target identity in the bilateral AI (MNI coordinates = -52, 30, 6 and 28, 16, -2) and the temporal gyri (MNI coordinates = -58, -36, 2) but these clusters did not survive significance thresholding. Likewise, the interaction between event and group showed a tendency for activations in the mPFC (MNI coordinates = -4, 48, -6) and TPJ (MNI coordinates s= -54, 0, -12), but these were not significant when controlling for family-wise error.

The main effect of the perceived event in activation of the functionally defined mPFC (as shown in the whole brain analysis, Table 4.1) was qualified by a significant interaction between the perceived event and the target identity, F (2, 78) = 3.42, MSE = .36, p =.038, η^2 =.08: The mPFC was more active during trials where an ingroup member was depicted experiencing a painful (M = .11, SD = .23) compared to neutral event (M = -.07, SD = .27), t (39) = 4.37, p < .001, 95% CI [.09, .26], d = .72. There was, however, no difference in painful (M = .03, SD = .21) compared neutral events (M = .001, SD = .24) when the target was from Plymouth, t (39) = .081, p = .425, 95% CI [-.05, .11], d = .14. There was also no difference in painful (M = .05, SD = .23) compared neutral events (M = -.001, SD = .28) when the target was from Bath, t (39) = 1.32, p = .189, 95% CI [-.15, .03], d = .23 (Figure 4.8). There was no main effect of target identity on mPFC activity, F (2, 78) = .001, MSE = .035, p =.999, η^2 = .00.

While there was a main effect of the perceived event on activation of the AI (as shown in the whole brain analysis, Table 4.1), there was no main effect of target identity, F (2, 78) = .573, MSE = .112, p =.566, η^2 =.014, and no interaction between event and target identity, F (2, 78) = .080, MSE = .086, p =.931, η^2 =.023.

Table 4.3. Summary of means, standard deviations, and correlations for scores on perceived competence, sociability, status, similarity with the ingroup, rivalry with the ingroup, and self-reported empathy from Chapter 4, Study 3

Exeter								
Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*
1. Competence	5.86	0.67	—					
2. Sociability	4.96	1.02	.45**	—				
3. Status	5.59	0.79	.47**	0.27	—			
4. Similarity	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—		
5. Rivalry	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—	
6. Empathy	79.65	18.52	-.09	0.07	-0.07	*N/A*	*N/A*	—
Plymouth								
Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*
1. Competence	4.35	0.88	—					
2. Sociability	4.73	0.96	.71**	—				
3. Status	3.59	1.06	.68**	.32*	—			
4. Similarity	3.34	1.05	.54**	.35*	.57**	—		
5. Rivalry	4.13	1.17	.64**	.49**	.64**	.56**	—	
6. Empathy	77.98	18.28	-.07	-.03	-.03	-.16	.06	—
Bath								
Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*
1. Competence	5.56	0.59	—					
2. Sociability	4.98	0.89	.77**	—				
3. Status	5.66	0.92	.52**	-.02	—			
4. Similarity	5.4	1.17	.14	.01	.27	—		
5. Rivalry	4.74	0.96	.26	.19	.27	.09	—	
6. Empathy	77.95	19.07	-.04	-.06	.05	-.04	.08	—

Note: ** correlation is significant at the 0.01 level and * is significant at the 0.05 level (2-tailed)

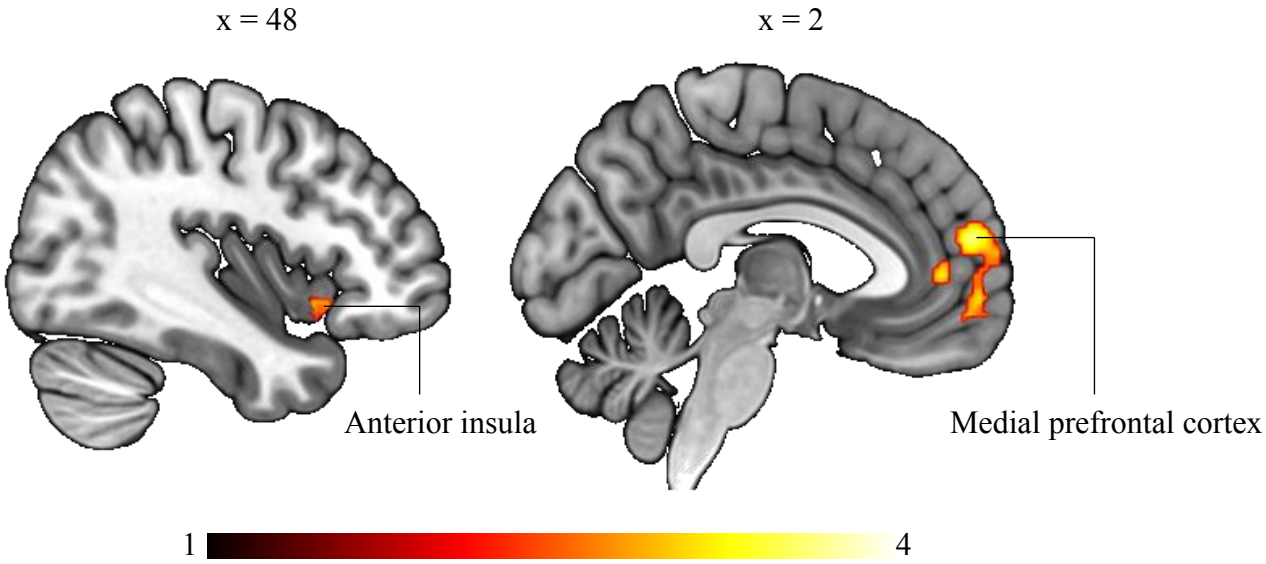

Figure 4.7. Increased brain activity in the anterior insula and medial prefrontal cortex in response to the observation of painful (vs neutral) events, p <.05 (FWE, cluster level) from Chapter 4, Study 3

Table 4.4. Results from the full factorial analysis of variance from Chapter 4, Study 3.

Region	Side	Extent (*k*)	Z (*peak*)	MNI X	Y	Z
***a) Main effect* Perceived Event: Painful > Neutral**						
Medial prefrontal cortex	R	383	4.09	2	60	18
Anterior insula	R	195	3.41	48	24	-16
Dorsomedial prefrontal cortex	L	135	3.26	-10	48	42
***b) Main effect* Target Identity: Exeter > Plymouth > Bath**						
Anterior insula	L	26	2.91	-52	30	6
Orbitofrontal gyrus	L	22	3	-46	34	-14
Superior temporal gyrus	L	12	3.07	-58	-36	2
Temporal pole	R	12	2.77	46	8	-16
Anterior insula	R	11	2.85	28	16	-2
***c) Interaction*: Perceived Event * Target Identity [(PE>PP>PB) + (NB>NP>NE)]**						
Ventromedial prefrontal cortex	L	44	3.14	-4	48	-6
Superior temporal gyrus	L	26	3.31	-54	0	-12
Temporoparietal junction	L	24	3.25	-26	-60	8
Fusiform face area	L	20	2.97	-36	-76	-2

Note: The main effect of event (a) shows regions that survived a cluster-level threshold of z > 2.3, p <.05, FWE-corrected, whereas the main effect of target identity (b) and the interaction (c) show clusters from the uncorrected threshold image. A minimum voxel-level threshold of 10 mm was applied to all contrasts.

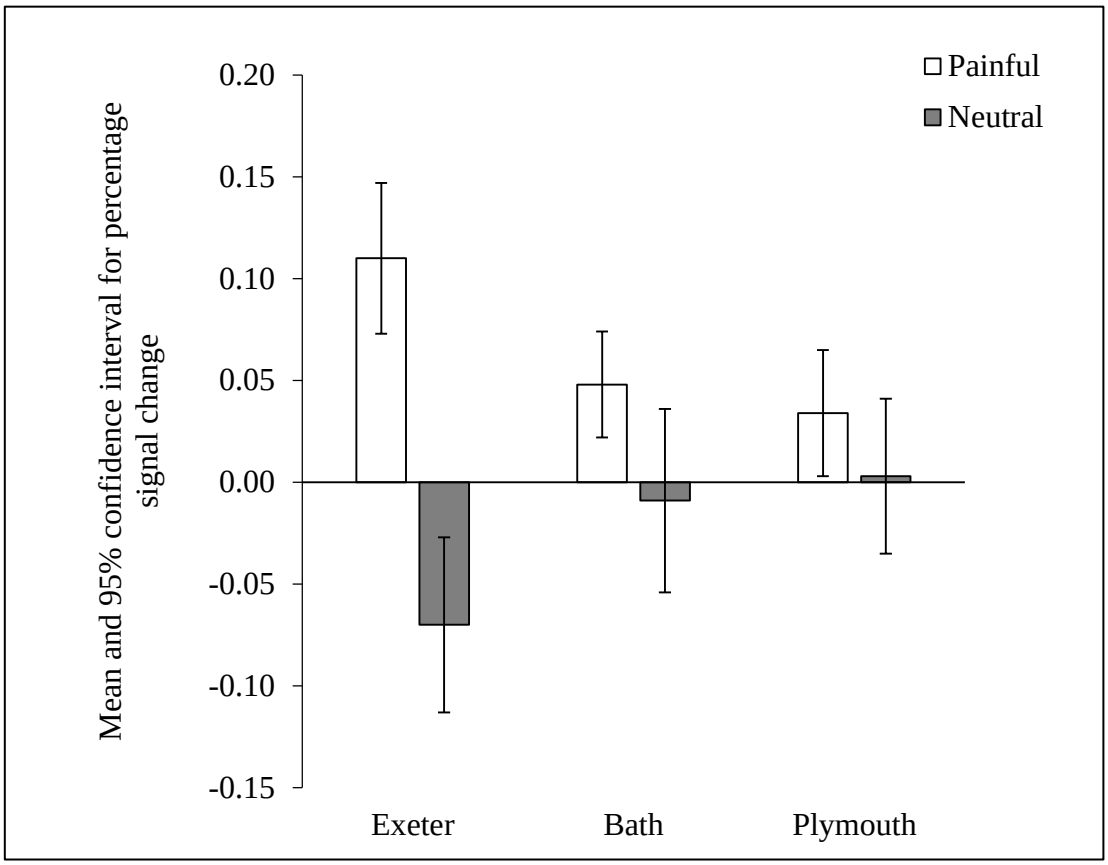

Figure 4.8. The mean percentage signal change in BOLD within the medial prefrontal cortex during painful and neutral trials per target identity (functional ROI defined by the painful > neutral event contrast) from Chapter 4, Study 3. Error bars depict the 95% confidence intervals.

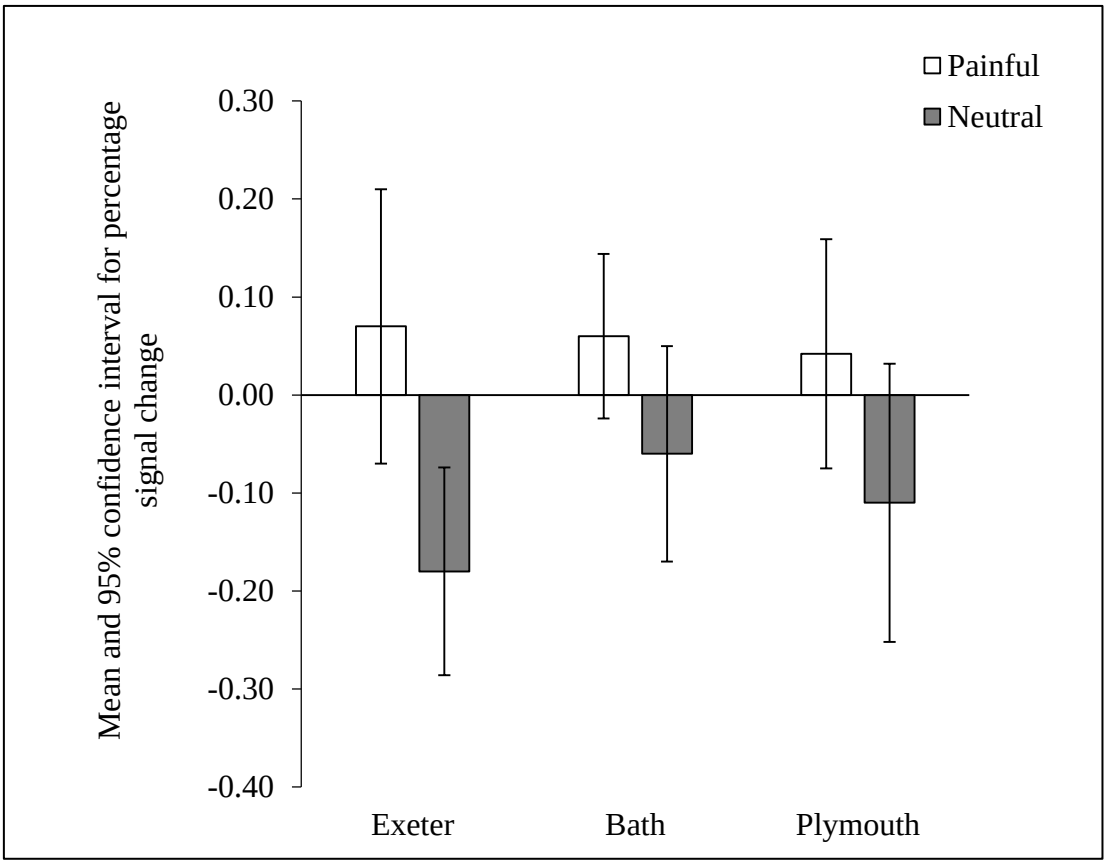

Figure 9.4. The mean percentage signal change in BOLD within the anterior insula during painful and neutral trials per target identity (functional ROI defined by the painful > neutral event contrast) from Chapter 4, Study 3. Error bars depict the 95% confidence intervals.

4.1.3 Discussion

Previous research has demonstrated that participants exhibit lower empathy-related BOLD responses while observing other-race targets in pain (compared to when the participant and target are of the same race; Xu et al., 2009). However, the neural activations associated with empathy do not selectively respond towards the pain of an ingroup target. Different effects emerge depending on beliefs about the target's group, such as whether or not the outgroup constitutes a threat to the ingroup (Cikara et al., 2014), is perceived as higher status than the ingroup (Feng et al., 2016), or typically elicits feelings of envy (compared to pity, admiration, or contempt; Cikara & Fiske, 2011). These findings converge on the notion that empathy is flexibly recruited according to how the individual perceives the other's group, rather than simply to generic ingroup-outgroup distinctions.

Previous research is limited by the contexts in which researchers have primed intergroup comparisons. These intergroup contexts fall in to one of two categories: Contexts in which pre-existing beliefs about the other group do not exist (e.g., minimal group paradigms) or in which pre-existing beliefs are confounded with visually salient characteristics of the other's group (e.g., physiognomy and skin colour). Cikara and Fiske (2011) report one of few studies to focus on the role that group-based beliefs play during intergroup empathy. However, to some extent, this study suffers from these visual confounds as well: The photographs used in the study vary largely in terms of configuration (e.g., dimension, perspective, and orientation), but also in terms of the target's facial expressions. For example, in some pictures the target is smiling (which is known to enhance social evaluation; Guadagno, Swinth, & Blascovich, 2011) while in others the target is frowning (an expression which is detected and processed more quickly than others; Fox et al., 2000).

The goal of Study 3 was to determine whether beliefs can drive empathic bias in a multiple outgroup context and while controlling for visual cues to group categorisation. In

this thesis, I focus on a specific facet of empathy, experience-sharing, where previously researchers studied empathic-concern (i.e., Cikara & Fiske, 2011). In Study 3, participants exhibited an ingroup bias in self-reported empathy. However, this was only the case when comparing responses towards members of the ingroup and members of the more competitive outgroup: There was no difference in self-reported empathy comparing responses to members of the ingroup and the less competitive outgroup.

The fMRI results show that participants exhibited more activity in regions associated with empathy when viewing trials depicting a target in physical pain, compared to trials involving neutral events (Lamm et al., 2011). Interestingly, this was qualified by an interaction with the identity of the target individual. The mPFC was more active during trials where an ingroup member was depicted experiencing a painful, compared to a neutral, event whereas there was no reliable difference between event types if the target was from either of the outgroups. These findings are consistent with previous research demonstrating that empathy-related brain activation varies according to a target's group membership (Xu et al., 2009).

Prior research also suggests that bias does not simply arise as a function of ingroup-outgroup categorisations, but rather fluctuates based on how specific outgroups are perceived in relation to the ingroup, for example, whether or not the outgroup is perceived to be higher status than the ingroup (Feng et al., 2016), as a rival of the ingroup (Cikara, Botvinick, & Fiske, 2011; Hein, Silani, Preuschoff, Batson, & Singer, 2010), or is perceived to be enviable (Cikara & Fiske, 2011). Contrary to predictions, however, I found there was no effect of the target identity nor any interaction between the identity and the event type in activation of the AI.

There were, however, a number of limitations in this study that may suggest why the results were not in line with predictions. First and foremost, there were a number of voxels

that did not surpass the threshold for significant activation, for example, in the main contrast of the group identity and in the interaction between the perceived event type and the group identity. This, I suggest, is likely because the manner in which I designed the task caused inefficiencies in the detection of the neurological signal that is captured by fMRI. The structure of the trials constituted a slow event-related design, that is, an ISI that is longer than the duration (10-12 s) of the hemodynamic response function (HRF; Buckner et al., 1996). A more rapid design (shorter than the duration of the HRF) would increase statistical power by allowing for more stimuli per time unit (K. J. Friston, Holmes, Price, Büchel, & Worsley, 1999). However, rapid designs are more appropriately suited to the paradigms of classical neuropsychological experiments than to the paradigm presented here. For example, a number of participants reported that they struggled to complete the task with the time they were given. Given the complexity of the task, it is important that the participants have enough time to process pertinent details of the experiment (e.g., to process and memorise the target's identity, watch the animated event, and to consider their responses to that event). Therefore, in Study 4, I gave priority to ensuring participants had the time they needed to understand and complete the task.

A further goal of Study 4 was to demonstrate the causal relationship between perceived competition and intergroup empathic bias. To do this, I presented participants with a bogus news article that described three universities: The ingroup university, an outgroup university with which the ingroup had a longstanding rivalry, and an outgroup university with which the ingroup had no rivalry. I manipulated the article between two groups of participants, presenting one outgroup as the salient rival in one version and the other outgroup as the salient rival in the other version—creating a mirrored contrast in the between groups analysis.

The target universities described in the article, and presented in the main task, were Cardiff University and the University of Sussex. In Study 3, I presented students from either the University of Bath or the University of Plymouth, but pilot testing (N = 64) revealed that evaluations of the perceived rivalry of these groups to the ingroup were stable and resistant to experimental manipulation. In short, regardless of the information that was presented to participants, they always rated students from Bath as rivals, but in no situation did they ever rate students from Plymouth as rivals. On the other hand, I did have success at manipulating beliefs regarding the extent to which students from Cardiff and Sussex universities were seen as rivals to the ingroup. I expected that empathy would be reduced towards members of the outgroup that was presented as a rival to the ingroup, compared to members of the outgroup that was not presented as a rival to the ingroup.

4.2 Study 4

4.2.1 Method

Design. This study followed a 2 (event: painful vs. neutral) x 3 (target identity: Exeter vs. Cardiff vs. Sussex)[6] x 2 (salient rival: Cardiff vs. Sussex) mixed measures design with the perceived event and target identity varied within participants, and the salience of rivalry varied between participants.

Participants. A total of 69 healthy volunteers—with no reported history of psychiatric or neurological disorders, and no current use of any psychoactive medications—were recruited from the University of Exeter and remunerated with £5 for their time. No participants had to be excluded from the analysis (from either self-report or fMRI data), leaving 69 participants in total (M_{age} = 20.57, SD = 3.04, 42 female, all right-handed). The study was approved by both the Ethics Committee of the School of Psychology, University of

[6] At the time of testing the University of Sussex was ranked 21st in the UK overall, compared to Exeter at 10th and Cardiff at 31st; CUG, 2016).

Exeter, and the Ministry of Defence Ethics Committee. Participant consent was obtained according to the Declaration of Helsinki (World Medical Association, 2013).

Stimuli. The stimuli consisted of those outlined in Study 2 with the exception that prior to entering the scanner, participants also read a bogus news article in which the outgroup was either described as a rival to the ingroup or not. The article itself discussed recent achievements of the ingroup university, but made salient an upwards, or unfavourable, comparison with one of the outgroups. Along the side of the article, was a graphic that depicted a 'brief history' of the rivalry between the ingroup and one of the outgroup universities (see Appendix C).

Measures. Following the bogus article, participants were given three questions to ensure that they had read the text and to further prime the perception of a rivalry between the ingroup and outgroup (e.g., 'According to this article, which of these three have a long-standing feud with the University of Exeter?'). Other measures within this study were identical to those in Study 3 with the exception that participants in Study 4 responded to items gauging other-focussed empathy ('how bad did you feel for the target?'), as well as self-focussed empathy ('how painful did the event seem to you?')

fMRI data analysis. For fMRI acquisition, pre-processing, and lower-level analyses, I used the same approach as reported in Study 3. For higher level analyses, I divided the participants into two groups according to the salience manipulation. For both, higher level between-group analyses were carried out using the mixed-effects model FLAME 1 (Beckmann et al., 2003; Woolrich et al., 2004).

4.2.2 Results

Self-reported responses. Participants' self-reported responses were analysed in a mixed measures analysis of variance (ANOVA). All *p* values correspond to two-tailed tests, Bonferroni-corrected, unless noted otherwise.

Competence and sociability. A mixed measures analysis of variance (ANOVA) revealed a significant effect of target identity on perceived group competence, F (2, 134) = 39.82, MSE = .385, p <.001, η^2 = .37. Participants rated students from the ingroup as significantly more competent (M = 5.93, SD = .73) than students at Cardiff (M = 5.40, SD = .94), t (68) = 6.19, p <.001, 95% CI [.32, .75], d = .63, and students at Sussex (M = 4.99, SD = 1.07), t (68) = 8.87, p <.001, 95% CI [.68, 1.19], d = 1.03. Participants also perceived students at Sussex to be less competent than students from Cardiff, t (68) = -3.32, p =.005, 95% CI [-.70, -.10], d = .41. There was no overall main effect of the salience manipulation, F (1, 67) = .76, MSE = .589, p =.388, η^2 = .01, but this was qualified by a significant interaction between target identity and the salience manipulation, F (2, 134) = 3.66, p =.028, η^2 =.05: Participants rated the perceived competence of students from Sussex equally regardless of whether the salient rival to the ingroup was Sussex (M = 5.05, SD = 1.30) or Cardiff (M = 4.94, SD = .79), t (67) = .413, p =.681, 95% CI [-.41, .62], d = .11. However, participants rated students from Cardiff as significantly more competent when Cardiff was presented as a rival to the ingroup (M = 5.63, SD = .80) compared to when Sussex was described as the salient rival to the ingroup (M = 5.17, SD = 1.02), t (67) = 2.09, p =.04, 95% CI [.02, .90], d =.46. The salience manipulation had no effect on ratings of perceived competence for members of the ingroup, t (67) = .718, p =.477, 95% CI [-.23, .48], d = .12.

The perceived sociability of targets was not affected by the target's identity, F (2, 134) = .896, MSE = .422, p =.411, η^2 = .01, or the salience manipulation, F (1, 67) = .061,

MSE = 1.69, p =.805, η^2 = .001. There was no interaction between target identity or the manipulation, F (2, 134) = 1.21, p =.300, η^2 = .02.

Status. There was a significant effect of target identity on ratings of status, F (2, 134) = 44.89, MSE = .598, p <.001, η^2 = .40. Participants rated students from the ingroup as significantly higher status (M = 5.80, SD = .67) than students at Cardiff (M = 4.98, SD = 1.22), t (68) = 5.01, p <.001, 95% CI [.34, 1.01], d = .72, and students at Sussex (M = 4.63, SD = 1.14), t (68) = 9.06, p <.001, 95% CI [.91, 1.59], d = 1.33. Participants also rated students at Sussex as lower status than students from Cardiff, t (68) = -4.67, p <.001, 95% CI [-.88, -.27], d = .50. There was no main effect of the salience manipulation, F (1, 67) = .213, MSE = 1.74, p =.646, η^2 = .003, but this was qualified by a significant interaction between target identity and the salience manipulation, F (2, 134) = 5.20, p = .007, η^2 = .07: Participants rated students from Sussex as equal in status whether the salient rival was Sussex (M = 4.82, SD = 1.20) or Cardiff (M = 4.45, SD = 1.06), t (67) = 2.14, p =.175, 95% CI [-.17, .92], d = .33. However, participants rated students from Cardiff as marginally higher in status when Cardiff was presented as a rival to the ingroup (M = 5.44, SD = 1.01) compared to when Sussex was described as the salient rival to the ingroup (M = 4.98, SD = 1.22), t (67) = 1.72, p =.08, 95% CI [-.07, 1.00], d = .41. The salience manipulation had no effect on ratings of perceived status of members of the ingroup, t (67) = 1.05, p =.297, 95% CI [-.47, .15], d = .14.

Similarity. There was a marginal effect of target identity on ratings of similarity with the ingroup, F (1, 67) = 3.15, MSE = .704, p =.08, η^2 = .04. Students from Cardiff (M = 5.19, SD = 1.39) were rated as marginally more similar to the ingroup than students from Sussex (M = 4.93, SD = 1.20), t (67) = 1.73, p =.087, 95% CI [-.04, .53], d = .20. There was no main effect of the salience manipulation, F (1, 67) = .019, MSE = 2.68, p =.892, η^2 = .000, but a

significant interaction emerged between target identity and the salience manipulation, F (2, 134) = 7.09, p = .01, η^2 = .09: This was explained by a tendency to rate students from Sussex as more similar to the ingroup when Sussex was presented as a salient rival, (M = 5.15, SD = 1.23) than when Cardiff was presented as the salient rival, (M = 4.73, SD = 1.15), t (67) = 1.46, p =.150, 95% CI [-.16, .99], d = .32, and students from Cardiff as more similar to the ingroup when Cardiff was presented as a salient rival (M = 5.36, SD = 1.17) than when Sussex was presented as the salient rival, (M = 5.01, SD = 1.59), t (67) = 1.01, p =.313, 95% CI [-.33, 1.02], d =.26.

Rivalry. There was a significant effect of target identity on ratings of perceived rivalry, F (1, 67) = 20.63, MSE = 1.12, p <.001, η^2 = .24. Students from Cardiff (M = 4.70, SD = 1.56) were rated as significantly more of a rival to the ingroup compared to students from Sussex (M = 3.88, SD = 1.25), t (68) = 4.49, p <.001, 95% CI [.45, 1.17], d =.58. There was a main effect of the salience manipulation, F (1, 67) = 8.70, MSE = 2.33, p =.004, η^2 = .12, but this was qualified by a significant interaction between the target identity and the salience manipulation, F (2, 134) = 16.60, p < .001, η^2 = .19: Participants rated students from Sussex to be as much of a rival to the ingroup whether the salient rival was Sussex (M = 3.87, SD = 1.39) or Cardiff (M = 3.90, SD = 1.09), t (67) = .11, p =.915, 95% CI [-.64, .57], d = .01. However, participants rated students from Cardiff as significantly more of a rival to the ingroup when Cardiff was presented as a rival to the ingroup (M = 5.44, SD = 1.18), compared to when Sussex was presented as a rival to the ingroup (M = 3.94, SD = 1.54), t (67) = 4.55, p <.001, 95% CI [.843, 2.16], d = 1.06.

Self-focussed empathy. A repeated measures analysis of variance revealed a significant main effect of the event (painful vs. not) on ratings of self-focussed empathy, F (1, 67) = 1175.37, MSE = 550.14, p <.001, η^2 =.95. Participants perceived painful events as

more painful (*M* = 84.84, *SD* = 15.24) than neutral events (*M* = 5.79, *SD* = 1.35), *t* (68) = 34.54, *p* <.001, 95% CI [74.48, 83.62], *d* = 7.31.

There was a main effect of target identity, *F* (2, 134) = 25.62, MSE = 45.73, *p* <.001, η^2 =.27. Participants indicated perceiving the pain of ingroup targets to appear more painful (*M* = 89.08*, SD* = 14.10) than the pain of students from Cardiff (*M* = 83.02*, SD* = 16.54), *t* (68) = 5.52, *p* <.001, 95% CI [3.63, 9.49], *d* =.39, or the pain of students from Sussex (*M* = 81.99*, SD* = 14.87), *t* (68) = 7.31, *p* <.001, 95% CI [5.04, 10.15], *d* =.49. There was no significant difference in self-focussed empathy between targets from Cardiff and targets from Sussex *t* (68) = .850, *p* =.398, 95% CI [-1.94, 4.01]. Manipulating the salient rival had no effect on ratings of empathy measured in this self-focussed way, *F* (1, 67) = .987, MSE = 603.38, *p* =.324, η^2 =.015. There were also no interaction effects between the target identity and the salience manipulation on this measure, *F* (1, 67) = .157, *p* = .855, η^2 =.002.

Other-focussed empathy. There was a strong main effect of the perceived event on other-focussed empathy, *F* (1, 67) = 849.821, MSE = 671.21, *p* <.001, η^2 =.93. Participants reported feeling worse for targets during painful (*M* = 82.82, *SD* = 18.67), relative to neutral, events (*M* = 8.57, *SD* = 1.56), *t* (68) = 29.37, *p* <.001, 95% CI [69.21, 79.29], *d* = 5.60.

There was a main effect of target identity, *F* (2, 134) = 21.46, MSE = 48.92, *p* <.001, η^2 =.24. Participants reported feeling worse observing ingroup targets experiencing pain (*M* = 87.08*, SD* = 18.07) compared to when observing students from Cardiff (*M* = 82.04*, SD* = 17.69), *t* (68) = 5.11, *p* <.001, 95% CI [2.62, 7.45], *d* =.28, and when observing students from Sussex (*M* = 79.41*, SD* = 19.30), *t* (68) = 5.85, *p* <.001, 95% CI [4.46, 10.89], *d* =.41. There was no difference in other-focussed empathy for students from Cardiff compared to students from Sussex *t* (68) = -2.11, *p* =.115, 95% CI [-5.72, .43], *d* = .14. There was no main effect of the salience manipulation, *F* (1, 67) = .708, MSE = 919.68, *p* =.403, η^2 =.01, nor was there

any interaction between target identity and the salience manipulation on this measure, F (2, 134) = .188, p =.829, η^2 =.003.

fMRI results. At the whole brain level, participants showed greater activation when observing painful (vs neutral) events in large clusters of bilateral fusiform gyrus (MNI: -44, -56, -18; 48, -72, -10), the medial prefrontal cortex (mPFC; MNI: 0, 56, 26), temporoparietal junction (TPJ; MNI: -2, -62, 34), dorsal anterior cingulate (dACC; MNI: 2, 24, 32), and the anterior insula (AI; MNI: -36, 6, 36; Figure 4.10 and Table 4.6). There was also a main effect of target identity in the activation of mPFC (MNI: 22, 60, 18), TPJ (MNI: -54, -56, 16), dACC (MNI: -26, 2, 44), IFG (MNI: 2, -42, -6), and AI (MNI: 28, 20, 4). In the interaction between the perceived event and target identity, significant clusters emerged in the right TPJ (MNI: 28, -48, 6), precuneus (MNI: 0, -54, 48), mPFC (MNI: -24, 40, 20), and AI (MNI: -40, -2, 6). There were no significant effects of the salience manipulation on regional activity.

Analysing activity within the functionally defined mPFC (defined by the main effect of event; painful > neutral trials) demonstrated that the main effect of the perceived event in activation of the mPFC (as shown in the whole brain analysis, Table 4.6) was qualified by an interaction between event and identity, F (2, 134) = 23.09, MSE = .090, p <.001, η^2 = .26: The mPFC was more active during trials where an ingroup member was depicted experiencing a painful (M = .23, SD = .51) compared to neutral event (M = -.18, SD = .49), t (67) = 8.08, p < .001, 95% CI [.31, .51], d = 1.05, or where a target from Sussex experienced a painful (M = .09, SD = .42) compared to neutral event (M = -.12, SD = .37), t (67) = 4.02, p < .001, 95% CI [.10, .31], d = .54. However, the pattern of results approached significance in the opposite direction when targets from Cardiff were depicted as experiencing painful (M = -.22, SD = .37) compared to neutral events (M = -.14, SD = .39), t (67) = -1.77, p = .084, 95% CI [-.01, .17], d = .18 (Figure 4.11). This interaction further qualified a main effect of

identity, F (2, 134) = 14.18, MSE = .121, p <.001, η^2 = .18: The mPFC was more active during trials depicting the pain of an ingroup target (M = .23, SD = .51) compared to a target from Sussex (M = .09, SD = .42), t (67) = 3.02, p = .01, 95% CI [.03, .27], d = .30, or Cardiff (M = -.22, SD = .37), t (67) = 6.45, p < .001, 95% CI [.28, .63], d = 1.01, or a target from Sussex compared to a target from Cardiff, t (67) = 6.08, p < .001, 95% CI [.18, .44], d = .78. However, there was no difference in mPFC activity during trials depicting neutral events happening to ingroup targets (M = -.18, SD = .49) compared to targets from Sussex (M = -.12, SD = .37), t (67) = -.95, p = 1.00, 95% CI [-.21, .09], d = .14, or Cardiff (M = -.15, SD = .39), t (67) = .87, p = 1.00, 95% CI [-.13, .06], d = .07, or targets from Sussex compared to targets from Cardiff , t (67) = .45, p = 1.00, 95% CI [-.11, .16], d = .08. There was no effect of the salience manipulation, F (1, 67) = .794, MSE = .628, p =.376, η^2 = .012, nor any interaction between the manipulation and any other factor in the model.

Regarding the AI, the main effect of the perceived event was qualified by a significant interaction between event and the target's identity, F (2, 134) = 6.46, MSE = .051, p =.002, η^2 = .09: The AI was more active during trials where an ingroup member was depicted experiencing a painful (M = .09, SD = .27) compared to a neutral event (M = -.03, SD = .31), t (67) = 3.31, p = .002, 95% CI [.05, .19], d = .41, or where a target from Sussex experienced a painful (M = .08, SD = .29) compared to a neutral event (M = -.02, SD = .24), t (67) = 3.05, p = .003, 95% CI [.04, .18], d = .38. There was, however, no difference in AI activity when targets from Cardiff were depicted as experiencing painful (M = -.03, SD = .32) compared to neutral events (M = .02, SD = .33), t (67) = -1.32, p = .187, 95% CI [-.14, .03], d = .15 (Figure 4.12).This interaction also qualified a significant main effect of target identity, F (2, 134) = 7.52, MSE = .077, p =.001, η^2 = .10: The AI was equally active during trials depicting the pain of an ingroup target (M = .09, SD = .27) and the pain of a target from Sussex (M = .08, SD = .29), t (67) = .07, p = 1.00, 95% CI [-.072, .077], d = .008, but more active

compared to the pain of a target from Cardiff (*M* = -.03*, SD* = .32), *t* (67) = 3.22, *p* = .006, 95% CI [.03, .21], *d* = .31, or a target from Sussex compared to a target from Cardiff, *t* (67) = 3.14, *p* = .008, 95% CI [.02, .21], *d* = .29. However, there was no difference in AI activity during trials depicting neutral events happening to ingroup targets (*M* = -.03*, SD* = .32) compared to targets from Sussex (*M* = -.02*, SD* = .24), *t* (67) = -.14, *p* = 1.00, 95% CI [-.11, .09], *d* = .18 or Cardiff (*M* = .02, *SD* = .33), *t* (67) = -1.72, *p* = .276, 95% CI [-.13, .02], *d* = .15, or targets from Sussex compared to targets from Cardiff, *t* (67) = -1.23, *p* = .679, 95% CI [-.15, .05], *d* = .14. There was no main effect of the salience manipulation, *F* (1, 67) = .062, MSE = .304, *p* =.804, η^2 = .001, nor any interaction between the manipulation and any other factor in the model.

With regard to activation of the dACC the main effect of the perceived event was qualified by a significant interaction between event and identity, *F* (2, 134) = 9.72, MSE = .065, *p* <.001, η^2 = .13: The dACC was more active during trials where an ingroup member was depicted experiencing a painful (*M* = .03*, SD* = .32) compared to a neutral event (*M* = -.11*, SD* = .31), *t* (67) = 4.08, *p* < .001, 95% CI [.08, .22], *d* = .44, or where a target from Sussex experienced a painful (*M* = .11*, SD* = .44) compared to a neutral event (*M* = -.11*, SD* = .29), *t* (67) = 4.51, *p* < .001, 95% CI [.12, .31], *d* = .59. There was, however, no difference in dACC activity when targets from Cardiff were depicted as experiencing painful (*M* = -.14*, SD* = .36) compared to neutral events (*M* = -.08*, SD* = .39), *t* (67) = -1.11, *p* = .267, 95% CI [-.14, .04], *d* = .16 (Figure 4.13). This interaction also qualified a significant main effect of target identity, *F* (2, 134) = 7.15, MSE = .066, *p* =.001, η^2 = .09: The dACC was equally active during trials depicting the pain of an ingroup target (*M* = .03*, SD* = .32) and the pain of a target from Sussex (*M* = .11*, SD* = .44), *t* (67) = -1.80, *p* = .227, 95% CI [-.17, .03], *d* = .21, but more active compared to the pain of a target from Cardiff (*M* = -.14*, SD* = .36), *t* (67) = 4.12, *p* > .001, 95% CI [.07, .28], *d* = .49, or a target from Sussex compared to a target from

Cardiff, t (67) = 5.00, p < .001, 95% CI [.13, .37], d = .62. However, there was no difference in dACC activity during trials depicting neutral events happening to ingroup targets (M = -.11, SD = .31) compared to targets from Sussex (M = -.11, SD = .29), t (67) = -.16, p = 1.00, 95% CI [-.12, .10], d = .00, or Cardiff (M = -.09, SD = .39), t (67) = -.66, p = 1.00, 95% CI [-.11, .06], d = .06, or targets from Sussex compared to targets from Cardiff, t (67) = -.33, p = 1.00, 95% CI [-.13, .10], d = .06. There was no main effect of the salience manipulation, F (1, 67) = .062, MSE = .304, p =.804, η^2 = .001, nor any interaction between the manipulation and any other factor in the model.

Item-wise analysis. There was a significant difference in how participants responded to the two self-reported empathy items, F (1, 68) = 4.23, p =.044, η^2 = .06: Participants reported significantly lower empathy ratings in response to other-focussed items (i.e., 'how bad did you feel for the target?'; M = 82.84, SD = 17.47) relative to self-focussed items (i.e., 'how painful did the event seem for you?'; M = 84.87, SD = 14.18), t (68) = -2.06, p =.044, 95% CI [-3.99, -.06], d = .13.

There were also significant differences in how participants responded to these items at the level of neural activation. There was significantly more activity in the AI, t (68) = 3.88, p < .001, 95% CI [.26, .80], d = .86, and dACC, t (68) = 2.11, p = .039, 95% CI [.03, 1.21], d = .48, when participants responded to self-focussed, compared to other-focussed, items. In contrast, there was significantly more activation of the mPFC, t (68) = 5.52, p < .001, 95% CI [.21, .44], d = .45, when participants responded to other-focussed, compared to self-focussed, items (Figure 4.14 and Table 4.6d).

Table 4.5. Summary of means, standard deviations, and correlations for scores on perceived competence, sociability, status, similarity with the ingroup, rivalry with the ingroup, and self-reported empathy split by the between groups manipulation of the salient rival from Chapter 4, Study 4

Sussex as rivals										Cardiff as rivals									
Exeter																			
Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1. Competence	5.87	0.79	—							1. Competence	5.99	0.68	—						
2. Sociability	5.13	0.86	.74**	—						2. Sociability	5.20	0.89	.63**	—					
3. Status	5.80	0.67	.45**	.51**	—					3. Status	5.96	0.62	.59**	.40*	—				
4. Similarity	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—				4. Similarity	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—			
5. Rivalry	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—			5. Rivalry	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—		
6. Other-focussed	85.41	18.67	.05	.11	-.14	*N/A*	*N/A*	—		6. Other-focussed	88.70	17.59	-.05	-.13	-.22	*N/A*	*N/A*	—	
7. Self-focussed	88.05	15.24	.12	.03	-.14	*N/A*	*N/A*	.88**	—	7. Self-focussed	91.08	12.95	.09	-.03	-.16	*N/A*	*N/A*	.87**	—
Sussex																			
Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1. Competence	5.05	1.30	—							1. Competence	4.94	0.79	—						
2. Sociability	5.16	1.24	.84**	—						2. Sociability	4.91	0.85	.65**	—					
3. Status	4.82	1.20	.84**	.69**	—					3. Status	4.45	1.06	.53**	.23	—				
4. Similarity	5.15	1.23	.47**	.19	.53**	—				4. Similarity	4.73	1.15	.40*	.22	.67**	—			
5. Rivalry	3.87	1.39	.04	-.003	.19	-.06	—			5. Rivalry	3.90	1.09	-.02	-.02	.39*	.45**	—		
6. Other-focussed	77.19	20.63	.46**	.26	.36*	.42*	.05	—		6. Other-focussed	81.56	17.95	-.28	-.36*	.26	.05	.32	—	
7. Self-focussed	79.89	16.84	.19	.08	.04	.24	.08	.86**	—	7. Self-focussed	84.04	12.59	-.09	-.27	.21	.11	.16	.75**	—
Cardiff																			
Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*
1. Competence	5.17	1.02	—							1. Competence	5.63	0.80	—						
2. Sociability	5.15	0.84	.70**	—						2. Sociability	5.18	0.77	.21	—					
3. Status	4.98	1.22	.55**	.34	—					3. Status	5.44	1.01	.85**	.15	—				
4. Similarity	5.01	1.59	.51**	.28	.76**	—				4. Similarity	5.36	1.17	.67**	.14	.66**	—			
5. Rivalry	3.94	1.54	.61**	.36*	.68**	.48**	—			5. Rivalry	5.44	1.18	.41*	.11	.63**	.44**	—		
6. Other-focussed	80.53	17.16	.23	.10	.03	.13	.03	—		6. Other-focussed	83.51	18.32	-.12	-.43**	.03	-.03	.12	—	
7. Self-focussed	81.49	18.07	.35*	.24	.32	.41*	.25	.84**	—	7. Self-focussed	84.51	15.01	-.007	-.18	.12	-.08	.14	.75**	—

Note: ** correlation is significant at the 0.01 level and * is significant at the 0.05 level (2-tailed)

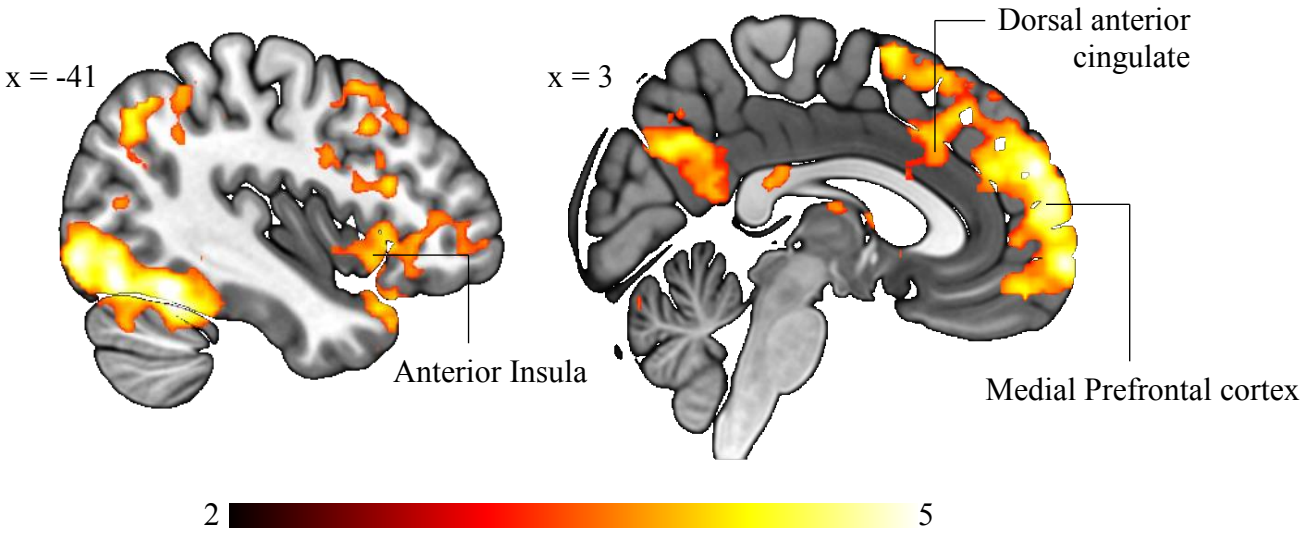

Figure 4.10. Increased brain activity in the anterior insula, dorsal anterior cingulate, and medial prefrontal cortex in response to the observation of painful (vs neutral) events, p <.05 (FWE, cluster level) from Chapter 4, Study 4.

Table 4.6. Results from the full factorial analysis of variance from Chapter 4, Study 4.

Region	Side	Extent	*Z*	MNI		
		(*k*)	*(peak)*	X	Y	Z
***a) Main effect* Perceived Event: Painful > Neutral**						
Fusiform gyrus	L	10034	6.06	-44	-56	-18
Fusiform gyrus	R	9679	5.71	48	-72	-10
Medial prefrontal cortex	L	6280	5.45	0	56	26
Temporo-parietal junction	L	686	5.11	-2	-62	34
Posterior cingulate	L	472	4.04	-14	-30	16
Superior parietal lobule	R	155	4.58	28	-56	34
Dorsal anterior cingulate	R	102	3.30	2	24	32
Middle cingulate	R	61	3.38	4	-28	24
Cerebellum	R	22	3.11	6	-74	-20
Primary motor cortex	R	14	3.66	10	4	70
Temporal pole	R	12	2.93	40	6	-28
Anterior insula	L	10	2.95	-36	6	36
***b) Main effect* Target Group: Exeter > Sussex > Cardiff**						
Medial prefrontal cortex	R	9242	5.01	22	60	18
Superior temporal gyrus	R	2570	4.70	58	-18	-8
Middle temporal	L	598	4.03	-52	-14	-10
Orbitofrontal cortex	L	421	4.17	-30	54	-12
Caudate nucleus	R	385	3.92	20	-26	18
Inferior frontal gyrus	L	339	3.77	-50	32	14

Temporo-parietal junction	L	214	3.52	-54	-56	16
Inferior frontal gyrus	R	203	4.15	2	-42	-6
Inferior frontal gyrus	L	167	3.65	-54	16	24
Dorsal anterior cingulate	L	149	3.44	-26	2	44
Dorsolateral prefrontal cortex	L	146	3.78	-32	46	26
Lateral occipital	L	94	3.28	-54	-66	4
Orbitofrontal cortex	R	86	3.92	20	60	-18
Anterior cingulate cortex	L	81	3.39	-14	22	30
Lateral occipital	R	76	3.98	46	-66	-8
Posterior occipital	R	58	3.11	46	-68	18
Anterior superior temporal gyrus	L	45	3.26	-56	-2	-16
Ventrolateral prefrontal cortex	L	39	3.18	-40	42	6
Anterior insula	R	29	3.19	28	20	4
Temporal pole	R	29	3.01	46	16	-28
Ventral premotor cortex	L	15	2.73	-54	8	36
Premotor cortex	L	11	2.96	-12	22	44
Amygdala	L	10	3.00	-36	0	-20

c) *Interaction*: Perceived Event * Target Group [(PE>PS>PC) > (NC>NS>NE)]

Temporo-parietal junction	R	32337	5.44	28	-48	6
Precuneus	L	644	3.88	0	-54	48
Intraparietal sulcus	R	413	4.80	40	-48	54
Amygdala	R	299	3.94	28	-10	-18
Superior parietal cortex	L	97	3.88	-28	-82	40
Inferior parietal cortex	L	59	3.13	-22	-66	36
Temporal pole	R	57	3.11	44	16	-30
Temporo-parietal junction	L	41	3.10	-24	-66	16
Posterior cingulate	L	37	3.06	0	-70	22
Orbitofrontal cortex	L	36	3.10	-20	36	-16
Medial prefrontal cortex	L	32	3.27	-24	40	20
Precuneus	L	29	3.29	-14	-56	34
Angular gyrus	L	27	3.16	-60	-48	24
Inferior temporal gyrus	R	23	3.18	42	-16	-34
Posterior parietal cortex	R	22	2.99	38	-80	32
Lingual gyrus	R	21	3.07	6	-74	6
Posterior cingulate	R	20	3.02	4	-38	42
Fusiform face area	L	16	3.03	-22	-102	-8
Anterior insula cortex	L	14	3.05	-40	-2	6

Basal ganglia	R	14	3.40	18	-24	4
Orbitofrontal cortex	R	14	3.11	24	54	-8
Nucleus accumbens	R	10	2.83	14	4	-6

d) *Main-effect* Other-focussed > Self-focussed
Item

Medial prefrontal cortex	L	77073	6.55	0	54	22
Fusiform face area	R	138	4.40	38	-62	-10
Postcentral gyrus	R	97	3.76	28	-26	62
Thalamus	R	23	3.06	20	-24	-2
Intraparietal sulcus	L	19	2.90	-44	-32	42
Amygdala	R	19	3.11	12	6	-24
Secondary somatosensory cortex	R	16	2.92	54	-32	22
Posterior temporal cortex	R	11	3.02	66	-42	-12
Fusiform face area	L	10	3.02	-40	-46	-22

Note: Regions surviving a cluster-level threshold of z > 2.3, p <.05, FWE-corrected are reported. A minimum voxel-level threshold of 10 mm was applied to all contrasts.

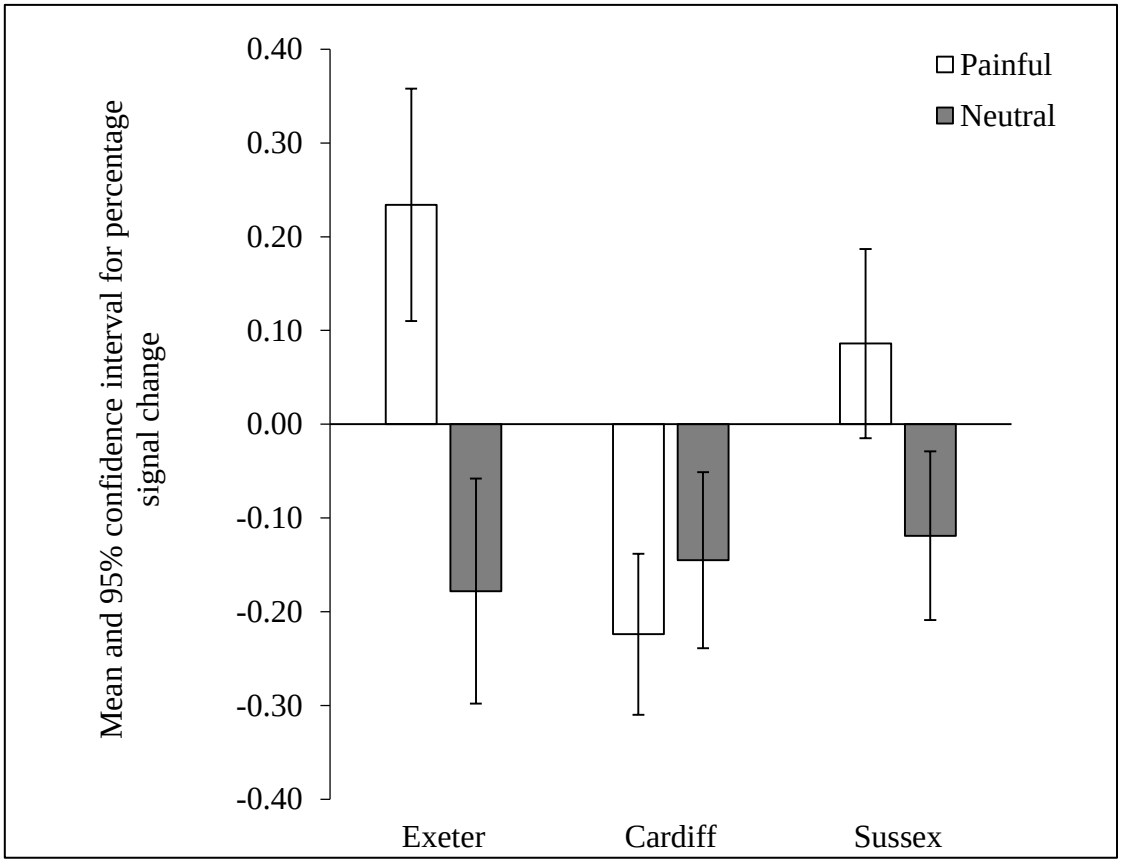

Figure 4.11. The mean percentage signal change in BOLD within the medial prefrontal cortex during painful and neutral trials per target identity (functional ROI defined by the painful > neutral event contrast) from Chapter 4, Study 4. Error bars depict the 95% confidence intervals.

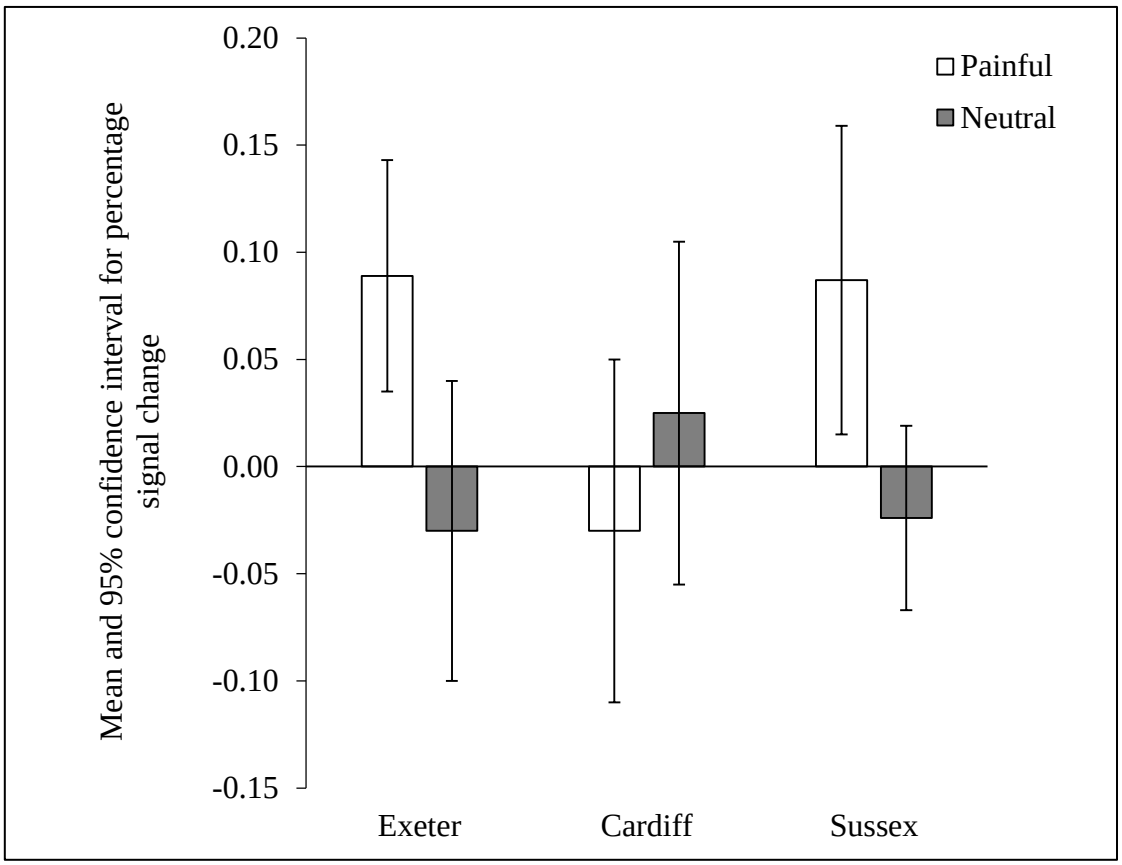

Figure 4.12. The mean percentage signal change in BOLD within the anterior insula during painful and neutral trials per target identity (functional ROI defined by the painful > neutral event contrast) from Chapter 4, Study 4. Error bars depict the 95% confidence intervals.

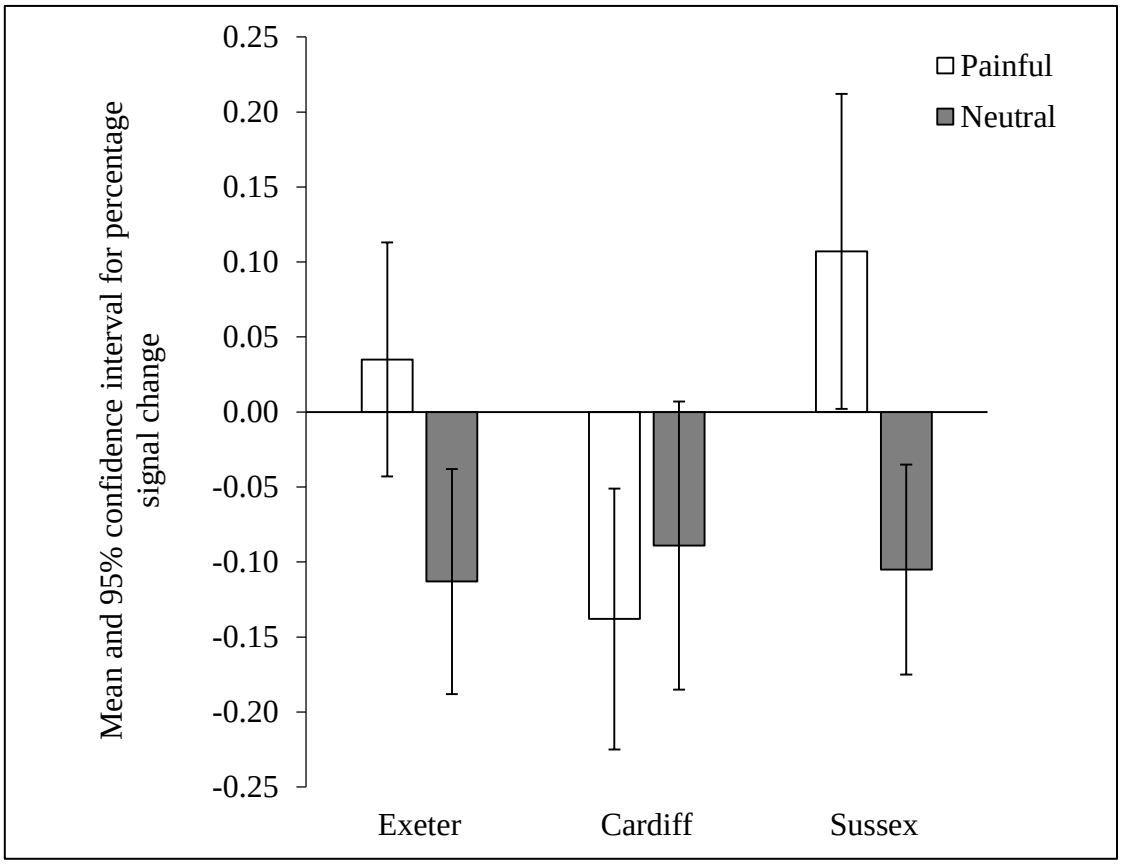

Figure 4.13. The mean percentage signal change in BOLD within the dorsal anterior cingulate during painful and neutral trials per target identity (functional ROI defined by the painful > neutral event contrast) from Chapter 4, Study 4. Error bars depict the 95% confidence intervals.

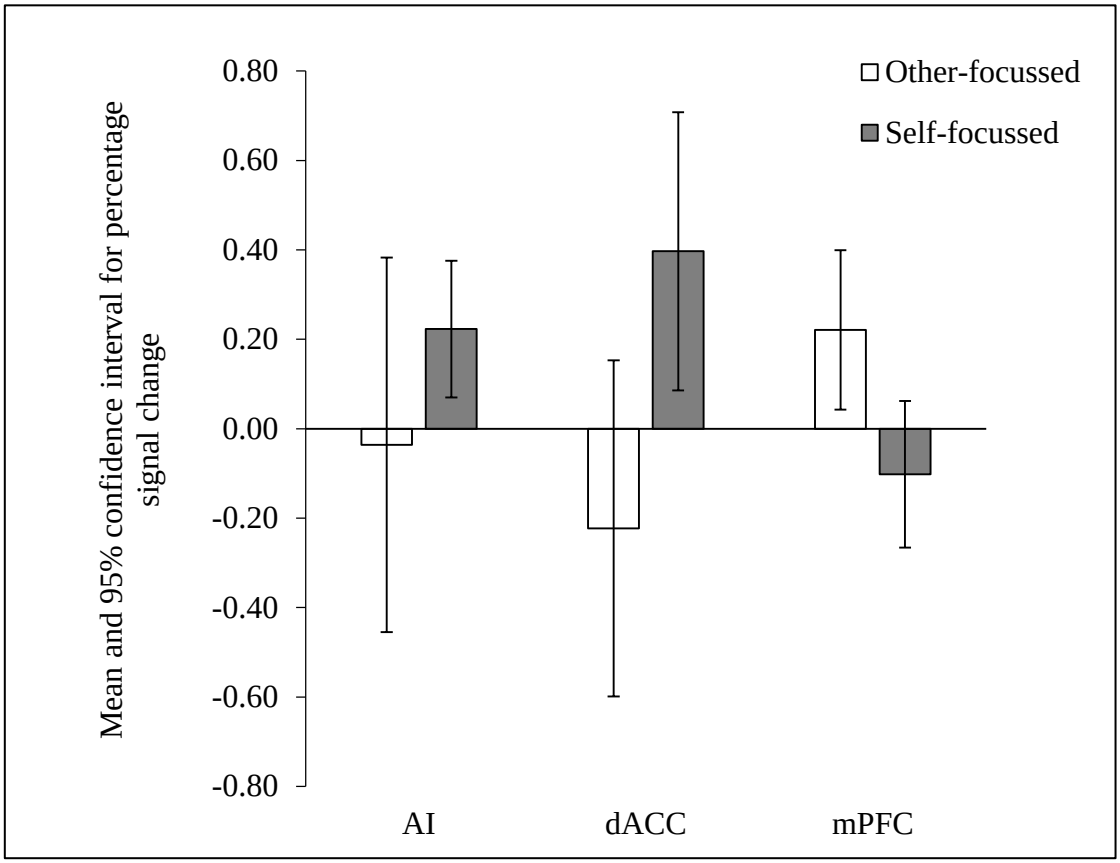

Figure 4.14. The mean percentage signal change in BOLD within the anterior insula, dorsal anterior cingulate, and medial prefrontal cortex in response to self-report items designed to gauge other- and self-focussed empathy (functional ROI defined by the painful > neutral event contrast) from Chapter 4, Study 4. Error bars depict the 95% confidence intervals.

4.2.3 Discussion

The goal of Study 4 was to demonstrate the causal relationship between perceived intergroup competition and empathic bias. The between groups manipulation was designed to make salient a rivalry between the ingroup and one of the outgroups. The manipulation significantly influenced ratings of the perceived status and rivalry with targets from one of the outgroups, Cardiff University. Specifically, participants who were told that the ingroup had a longstanding rivalry with Cardiff University rated students from Cardiff as higher status and more of a rival to the ingroup compared to participants who were told that the University of Sussex was a rival. The salience manipulation had no effect on how students from the University of Sussex were rated in terms of status and rivalry. Participants always

rated students from Cardiff as more competent, higher status, and greater rivals to the ingroup than students from Sussex—even when measurement followed information to the contrary. It is possible that students from Cardiff were seen as more of a threat to the ingroup due to their closer proximity than Sussex. Xiao and Van Bavel (2012) found that when a particular outgroup was portrayed as threatening to the salient ingroup, they were estimated to be closer in physical distance than an outgroup portrayed as non-threatening. It seems equally possible that the reverse is also true, that if one outgroup (such as Cardiff) is physically closer to the salient ingroup than another (such as Sussex) then they would be perceived as more of a threat.

Previous research has shown that there is a causal relationship between intergroup rivalry and empathic bias (Cikara, Bruneau, et al., 2011). It was expected therefore that manipulating the perceived rivalry between the ingroup and a target outgroup would impact empathic responses when observing members of that outgroup in pain. Increasing the perceived rivalry between the ingroup and Cardiff did not, however, have any significant effect on empathy for targets from Cardiff (either in self-reports or neural activations). This is unlikely to be because participants had simply forgotten the information from the bogus article: The manipulation and the self-reported perceptions took place at either end of the study (before and after the main task, respectively) and the manipulation did appear to affect some measures, such as ratings of perceived rivalry between the ingroup and Cardiff. It also does not seem likely that the manipulation was not strong enough: Statistically, there was a very strong effect on the extent to which students from Cardiff were seen as rivals of the ingroup. However, it is possible that the manipulation had no effect on empathy because the intergroup rivalry was presented as somewhat indirect (through status positions rather than in terms of a realistic conflict e.g., for resources)—as was used in previous studies (Cikara, Bruneau, et al., 2011; Hein et al., 2010). It is also possible that the manipulation did not affect

empathy because the events were unambiguously negative whereas in previous studies the negative events were merely of a misfortunate nature (e.g., stepping in chewing gum; Cikara & Fiske, 2011). In this case, it may be that individuals may not feel so strongly opposed to a rival outgroup as to wish permanent damage upon them, but may not feel as bad wishing inconvenience upon them.

While there were no effects of the salience manipulation on empathy, I found there was a consistent effect of the target's identity. Regions that process the sensory-discriminative aspects of pain (AI; Peyron, Laurent, & García-Larrea, 2000), the felt unpleasantness of physical pain (ACC; Rainville, Duncan, Price, & Bushnell, 2011; Singer et al., 2004), and those that support mentalising processes (mPFC; Frith & Frith, 2006) were all more active during trials depicting a painful event compared to a neutral event, but only if the target was from the ingroup or from Sussex—when the target was from Cardiff the difference was not only non-significant but it was also in the *opposite direction* (i.e., less activation to painful events compared to neutral events). Said another way, seeing targets being stabbed by an object that is physically painful (such as a knife) led to more activation of regions that process pain compared to seeing a target be lightly touched by an innocuous object (such as a spoon). Crucially, this was not the case if the recipient of pain was from the outgroup that was perceived overall to be more of a rival to the ingroup.

I found that regardless of whether or not Cardiff University was presented as a salient rival to the ingroup, participants exhibited less empathy towards targets from Cardiff (who were always rated as more of a rival to the ingroup than the other outgroup) compared to targets from either the ingroup university or from Sussex (who were always rated as less of a rival to the ingroup than the other outgroup). There was no difference in empathic responses to targets from the ingroup university and targets from Sussex. This revealed that empathy was not simply attenuated to outgroup, compared to ingroup, targets but rather empathy

varied according to relations between the ingroup and the outgroup, such as whether or not they were perceived to be in competition with another. This was not apparent in the self-report responses, but was clear at the level of neural activations—which are not subject to social desirability.

These findings are consistent with previous research but also differ in a number of ways. Cikara and Fiske (2011) found that participants exhibit biases in empathic concern to specific outgroups and these biases emerged based on how those groups were perceived by the individual. Cikara, Bruneau, and Saxe (2011) likewise found that empathy was significantly reduced—to the point of feeling joy or Schadenfreude—while observing competitors in pain. However, unlike them, I found that empathy was not switched off altogether nor did participants exhibit joy or reward-related neural activity. In my studies, participants reported feeling some empathy for a competitor's pain and they exhibited empathy at the neural level, it was merely relatively lower than the empathy reported/exhibited for the ingroup and less competitive outgroup. It is not entirely clear whether this relative difference was due to a dampening of empathy to a rival's pain (as Cikara and colleagues suggest) or whether it reflects an extraordinary amount of empathy for the ingroup (as suggested by Mathur, Harada, Lipke, & Chiao, 2010). What is clear, however, is that empathy does not simply switch on and off to an ingroup or outgroup's pain, it waxes and wanes according to our group memberships and more specifically the relations between those groups.

The results from Study 4, I believe, reveals something about empathy but more broadly they demonstrate how contextual cues (like a social group membership) can trigger expectations (like a particular group is competing with yours for certain resources) that exert a top-down influence on ostensibly automatic perceptual processing (such as pain perception; Decety & Lamm, 2006; Zaki & Ochsner, 2012). Indeed, social identity processes can

penetrate automatic processing at the earliest components of perception (Ratner & Amodio, 2013). And, in the context of pain, this can have potentially disastrous consequences for certain groups in society. For example, researchers have identified that individuals from racial minority groups typically receive less pain relief treatment than white individuals in emergency room settings (Pletcher, Kertesz, Kohn, & Gonzales, 2008) and this appears to be tied to the inaccurate beliefs that medical practitioners have over the biological differences between whites and racial minorities (Hoffman et al., 2016). Although a thorough discussion is beyond the scope of the current thesis, the results from these studies point towards a growing body of work that suggests that even seemingly automatic or bottom-up neural processes are modulated by top-down motivational goals.

In addition to the main analyses, I ran an item-wise analysis to delineate whether the different self-reported items of empathy were supported by activations in distinct brain regions. There was a dissociation between regional activations and self-reported empathy: Regions associated with experience-sharing (dACC and AI) were significantly more active while participants responded to self-focussed items during the response phase, but those associated with understanding other's mental states (i.e., mentalising; mPFC) were significantly more active when answering other-focussed items. Kanske and colleagues (2016) support such a distinction, describing experience-sharing as broadly 'feeling with' another (what I designate as self-focussed) (de Vignemont & Singer, 2006), compared to empathic concern as 'feeling for' another (other-focussed) (C. D. Batson et al., 1987). This also supports previous work demonstrating that different facets of empathy rely upon distinct neural architecture in the brain (Kanske, Böckler, Trautwein, Lesemann, & Singer, 2016a; Lamm et al., 2011; Ochsner et al., 2008; Zaki, Ochsner, Hanelin, Wager, & Mackey, 2007). Taken together, my analyses suggest that the task engaged the sharing, mentalising, and concern components of empathy, but also that what we as researchers ask participants at the

self-report level has implications for responses that are outside of a participant's volitional control.

4.3 Conclusion

In Chapter 4, I have presented novel evidence that beliefs about outgroups, and not merely an ingroup-outgroup distinction, modulate a specific facet of empathy, experience-sharing. In Study 3, participants reported feeling significantly worse for targets in pain when they were said to be members of the salient ingroup than a member of a rival outgroup—participants felt as bad if the target was a member of the relatively less competitive outgroup. At the neurological level, I replicated the results of previous studies showing that participants exhibited an ingroup bias in empathy-related BOLD activity, compared to either of the two outgroups. While there was no difference in empathic responses to the two outgroups, I have suggested how particular limitations in the design made it so.

In Study 4, I corrected some limitations in the design of the paradigm and showed that while participants reported only an ingroup bias at the self-report level, they exhibited more nuanced empathic biases at the level of neural activation. Specifically, participants exhibited more empathy-related activation while observing painful, compared to neutral, trials but only when the target was a member of the ingroup or the relatively less competitive outgroup. This difference was not only non-significant while observing targets of the rival outgroup, it was in the opposite direction. Finally, I also revealed that the self-report responses corresponded to activation in discrete regions of the brain. In sum, I have demonstrated that, during empathy, individuals not only process the group membership of the other (i.e., 'us' vs. 'them') but also process what that group means to them: They are not merely different from me, they are also a group with whom I am competing.

In this chapter I have demonstrated that threat by competition and social devaluation through upward comparisons can attenuate one's empathy towards another's pain. In Chapter 5, I discuss the role of threat that is incidental to the intergroup context plays during intergroup relations and the extent to which it influences empathy. I present two studies in which participants were asked to complete a task involving empathy for members of different groups while simultaneously receiving cues to induce fear.

5 The Role of Incidental Fear in Intergroup Empathic Bias

‘Neither a man nor a crowd nor a nation can be trusted to act humanely or to think sanely under the influence of great fear’ (Russell, 1952, p. 106).

Following a string of attacks in the US and across Europe, in Orlando, Nice, Berlin, Paris, and Brussels (Dorell, 2016), fears of terrorism are at record heights (J. Jones & Saad, 2016). One of the greatest fears for Americans in 2016 was falling victim to a terrorist attack, whereas in previous years their greatest fear of was natural threats, such as snakes and spiders (The GfK Group, 2014, 2016). In a sample of over 1500 Americans, 61% feared that the US would imminently experience a large-scale terrorist event such as 9/11. This belief motivated an increase in Islamophobia and support for discriminatory practices such as increased police presence in Muslim neighbourhoods and total cessation of all Muslim immigration to the US (The GfK Group, 2016).

Events that threaten our safety, like a terrorist attack, often foreshadow periods when a hard line is drawn between ‘us’ and ‘them’; they highlight how ‘we’ are similar to each other, but ‘they’ are different from us (Rothgerber, 1997). Indeed, simply being exposed to news of a terrorist attack causes individuals to express more prejudicial attitudes (Das, Bushman, Bezemer, Kerkhof, & Vermeulen, 2009) and reduces their prosocial intentions towards outgroup others (Tamborini et al., 2017). When people are scared they target certain groups, unfairly labelling them as perpetrators. For example, terrorist threats within Europe are overwhelmingly not from strangers overseas (as is often believed) but from fellow Europeans (Taub, 2016). However, nations increasingly endorse calls for tighter border control and closer scrutiny of immigrants and refugees.

Fear therefore drives a wedge in society and reshapes the political landscape—in fact, fear is often even leveraged with that purpose (Boyd, 2012). At the Nuremberg

Trials, Herman Goering said that to bring people to 'the bidding of leaders' you need only expose them 'to great danger' and tell them 'they are being attacked' (Gilbert, 1995, p.278-279). It's unsurprising, then, that fear features so prominently in political rhetoric (Gore, 2004). Harnessing the fears of a nation can provide the traction to pave the way for political movements, allowing candidates who stoke ethnic or cultural tensions to mobilise a populace towards right-wing nationalism (Valentino, Hutchings, & White, 2002). These are some of the reasons why researchers have become increasingly interested in how fear influences relations at the individual, collective, and national levels.

5.1 What Is Fear?

While threat refers to a broad set of scenarios, for example, as a response to challenges to one's status position, worldview, or self-impression (Stephan & Mealy, 2011), fear refers to a more specific focus on danger. Fear is a circumscribed area of threat and has the quality of an emergency (Rachman, 2004). When faced with life threatening events a set of biological mechanisms are triggered that aid in behavioural attempts to avoid or escape from threatening situations. This begins with the activation of the sympathetic nervous system, primarily by a release of adrenaline and norepinephrine (Cannon, 1932), as well as a hierarchical neural network including the amygdala and midbrain (Misslin, 2003). Together, these systems facilitate physical reactions to a threatening event, such as increased heart rate and breathing, to provoke responses that aid our evasion of specific survival-type emergencies (Rachman, 2004). From this perspective, the purpose of fear is to protect the self at all costs. But fear does not lead to a pathological need to ensure our survival while forsaking others.

5.2 Fear Leads to Group, Not Individual, Survival

Recently, researchers in crowd behaviour have documented that during large scale emergencies (e.g., the 2005 London bombings) victims didn't resort to mass panic and trample each other to save themselves (as previous accounts suggest; Dynes, 2003). Instead, the instinct for personal survival was overridden by a pro-social response, that is, people stopped to help each other out. Drury, Cocking, and Reicher (2009) suggested that, for the victims of those attacks, the threatening situation activated a sense of shared common fate. They perceived themselves as part of a psychological group, the function of which was to provide aid to its members and thereby increase everyone's chances of survival. This notion is derived from Self-Categorisation Theory (Turner et al., 1987), which posits that individuals can cognitively represent their sense of self as overlapping with others based on dimensions relevant to a given context (such as by gender, race, or political ideologies). In other words, if a group is important to us its members are incorporated into how we perceive ourselves (Brewer & Hewstone, 2004), leading to a psychological shift from 'me' as an individual to 'us' as a group.

5.3 Intergroup Bias: Ingroup Love

Humans have evolved to think in mental shortcuts, to form impressions of others on the basis of minimal social information such as their group membership (Macrae, Milne, & Bodenhausen, 1994). These shortcuts, while energy-saving and efficient, lead to a pervasive and often pernicious tendency to carve the social world into 'us' and 'them'.

When we share a group identity with another person (an ingroup member), we exhibit a preference towards them over those with whom we don't share an identity (an outgroup member), that is, 'ingroup favouritism' (Hewstone, Rubin, & Willis, 2002). This preference takes a variety of forms, for example, if a person is a member of our ingroup

we perceive them to be more human (Vaes, Leyens, Paladino, & Miranda, 2012) and we make fewer stereotypical judgments about them (Galinsky & Moskowitz, 2000; Wang, Ku, Tai, & Galinsky, 2014) than if they were a member of an outgroup. We also feel more empathy for their suffering (for a review, see Vanman, 2016) and as a result we are more likely to act prosocially towards one of 'us' than one of 'them' through acts of self-sacrifice (Prapavessis & Carron, 1997), moral-based decisions (Greene, 2013), and even in immoral behaviours, if the act results in net ingroup gains (Cadsby, Du, & Song, 2016; Prinz, 2011). There are a number of reasons why we tend to show favour to fellow members of a group.

The group is a source of benefit. Indeed, Yamagishi and Mifune (2008) suggested that helping the ingroup is a ticket to reciprocal living, a generalised exchange system in which one contributes to the group and in return receives the benefits of group membership. These benefits range from nourishment, resource sharing, and protection to basic psychological needs such as boosts to self-esteem, provision of status, and a sense of distinctiveness (Bowles, 2006; Brewer, 1991; Kelly & Spoor, 2005; Parrish, 1999; Tajfel, 1982; Tajfel & Turner, 1979).

The belief that the ingroup is a source of support is one that we develop from a young age (Kinzler & Spelke, 2011) and it is present among many species of the animal kingdom. For non-human animals, the benefits of group living are not only in hunting and foraging but also in providing a 'collective vigilance'. That is, groups provide better detection and warning of threats compared to individuals living on their own (R. S. Olson, Haley, Dyer, & Adami, 2015). This is particularly true when the members of our group are motivated to form attachments to each other (Ein-Dor & Hirschberger, 2016). But there are costs to group living: While there is 'us' there is also 'them', the other tribes that may constitute a threat to us and ours.

5.4 Intergroup Bias: Outgroup Hate

Around the same age when we learn to trust the ingroup we also develop the belief that the outgroup is more likely to be hostile than friendly towards us (Hamlin, Mahajan, Liberman, & Wynn, 2013; Rheingold & Eckerman, 1974). It is this belief that motivates our tendency to derogate the outgroup, that is, 'outgroup hate' (Hewstone et al., 2002). When interacting with 'them', it is difficult to predict how the exchange will go and what the outcomes of an interaction will be. The unexpected nature of this interaction can be a source of anxiety and dread (i.e., intergroup anxiety; Dovidio, Kawakami, & Gaertner, 2002; Mendes, Blascovich, Lickel, & Hunter, 2002; Stephan & Stephan, 1985) and this can lead to increased prejudicial attitudes towards outgroup members (Pettigrew & Tropp, 2008).

To a large extent, our negative perception of the outgroup is not within our conscious control. Neuroimaging research has revealed that humans process the faces of outgroup targets within the first 300ms of perception (Ito & Bartholow, 2009), typically represented by a positive peak at 200ms (thus named the P200). This peak is associated with observing an outgroup face, but also with vigilant perception (Bar-Haim, Lamy, & Glickman, 2005), indicating that our rapid and increased attention to an outgroup face is driven by automatic systems that monitor threat (Bartholow & Dickter, 2007). Supporting this notion, while we typically remember ingroup faces more accurately than outgroup faces (Ackerman et al., 2006) the effect reverses when the outgroup displays a threatening expression (Krumhuber & Manstead, 2011). This is likely because expressions of threat signify possible danger (Dimberg & Öhman, 1996; Lundqvist & Dimberg, 1995), which is particularly likely when the target belongs to a group the behaviour of whom we struggle to predict (i.e., the outgroup).

Fearing the outgroup serves an adaptive function as often outgroups have interests incompatible with the ingroup's and therefore represent a threat to ingroup

resources and survival (Navarrete, McDonald, Molina, & Sidanius, 2010). Researchers have identified that individuals exhibit a prepared fear response to outgroup targets in a manner similar to natural hazards such as snakes (Navarrete et al., 2012; Olsson, Ebert, Banaji, & Phelps, 2005). But this fear need not be existential in nature. Symbolic threats to one's culture, social identity, or relative status can exacerbate conflict between groups (Riek, Mania, & Gaertner, 2006). Indeed, anti-immigrant attitudes drastically rise during periods of slow economic growth and recession. The fear of losing income and status precedes a surge in public popularity for nationalist movements (Quillian, 1995). Moreover, social psychologists have demonstrated that opposition to immigration is highest for groups that have more to lose in unstable than stable economic climates; that the 'fear of falling' focuses attention towards the capacity for 'them' to encroach on 'us' (Jetten, Mols, Healy, & Spears, 2017).

5.5 The Role of Integral Fear During Intergroup Conflict

When two groups are in conflict, fear exacerbates group polarisation in a number of different ways, increasing the psychological distance between the ingroup and outgroup ('boundary activation'), the level of blame levelled at the outgroup ('outgroup negativity'), the perception of outgroup members as de-individuated ('homogenisation'), and the demand for loyalty to the ingroup ('ingroup solidarity'; Kuperman, 2013). Fear harnesses a deeply encoded belief that the social world consists of 'us' and 'them' and frames the context more specifically in terms of 'us' *vs.* 'them'; that they are in some way out to get us.

Our identities become more salient during times of fear and anxiety, and this provokes motivations towards aggression (Bar-Tal, Halperin, & De Rivera, 2007; Spanovic, Lickel, Denson, & Petrovic, 2010). Scholars have highlighted fear's role in producing 'near-genocidal behaviour towards neighbouring groups' (Ross, 2007, p. 37) and documented its influence in historical cases of genocide such as in Rwanda (McGarty &

McGarty, 2014), Darfur (Livingstone-Smith, 2011), and during the Holocaust (Newman & Erber, 2002). The victims of these group-based atrocities were often perceived as belonging to a threatening outgroup where in reality the groups were both a minority and defenceless. Depicting them as a threat and as less human (as insects or rats), however, expedited their persecution (Harris & Fiske, 2011; Haslam, 2006). Indeed seeing a group as less than human allows rapid defensive tendencies to guide behaviour against them (Bandura, 2002; Bandura, Underwood, & Fromson, 1975).

5.6 The Role of Incidental Fear During Intergroup Conflict

Aside from examining the role of fear that is inherent to an intergroup relation, researchers have also considered how fear that is incidental—unrelated to the specific group relation—might affect group processes. Fear distorts rational thought, it triggers knee-jerk reactions that distract from the truth of a situation—what economists call 'probability neglect' (Sunstein & Zeckhauser, 2010). When people are afraid, they become defensive and close-minded. Researchers have shown this in the lab. For example, reminding participants that one day they will die encourages them to vote for far-right political candidates, to support aggressive counter-terrorism policies (Landau et al., 2004), and to endorse harming those with a different worldview (McGregor et al., 1998), or culture (Pyszczynski et al., 2006).

Research has however revealed that fear alone is not sufficient to encourage intolerance towards others, rather, it is the combination of fear with uncertainty (Haas & Cunningham, 2014). Indeed, people use their group memberships to restore a sense of global control when personal control is questioned (Asbrock & Fritsche, 2013). But people also respond harshly to others in situations where they feel both threatened and uncertain—particularly when that uncertainty is of a personal, existential, or meaning-related nature (Heine, Proulx, & Vohs, 2006). For example, individuals will seek to

increase their sense of control by leaning towards right-wing authoritarian ideologies (Jost, Glaser, Kruglanski, & Sulloway, 2003). This is likely because an authoritarian ideology serves to restore structure and order to our perception of society (Duckitt, 2001). Crucially, however, fear moderates the effect of feelings of uncertainty on intolerance towards others, causing otherwise liberal thinkers to adopt more conservative and authoritarian perspectives (Nail, McGregor, Drinkwater, Steele, & Thompson, 2009).

Regardless of whether the other is truly responsible for our feelings of fear, we exhibit prejudice towards them as if they are (Cain, 2012; Choma, Hodson, & Costello, 2012; Hodson et al., 2013). Researchers are, however, vague on the underlying mechanisms that connect incidental emotion to intergroup bias. DeSteno and colleagues (2004) studied the role of incidental anger in prejudice, finding that simply asking participants to recall a time in which they were angry was sufficient to produce bias against members of a minimal outgroup. The researchers stated that the 'exact mechanism… remains unknown' (p. 323). They speculated however that in case of incidental anger, its association with intergroup competition evoked a 'psychological readiness' to derogate the outgroup (DeSteno et al., 2004). That, essentially, even though the outgroup was not the source of anger they were associated with it, as its recipients or source, more so than members of the ingroup.

There is little evidence to determine whether incidental fear has a casual role in intergroup bias and even fewer studies exist testing exactly in which direction fear (incidental or not) influences intergroup bias. For example, some have documented that other negative emotions like anger increase negativity towards the outgroup where fear exclusively enhances positivity towards the ingroup (Bukowski & Dragon, 2014). But this does not square with previous accounts that suggest fear of the other precedes

outgroup derogation (Quillian, 1995). The question remains, does fear operate only to push regard of the outgroup from indifference to hostility? Or does fear also strengthen solidarity with those whom we are already familiar? I have previously demonstrated that threat by competition and social devaluation can lead to attenuated empathy towards members of an outgroup, but does threat from other sources (i.e., that are incidental to the intergroup context) also affect empathy in the same way?

5.7 This Study

To answer these questions, I conducted two studies in which I measured self-reported empathy in a minimal group context, following inductions of fear or not. Empathy predicts prosocial behaviour and altruism (Batson, 2011; Christov-Moore, Sugiyama, Grigaityte, & Iacoboni, 2016; Eisenberg, Fabes, & Spinrad, 2007) and reduces negative attitudes towards stigmatised groups (Batson, Chang, Orr, & Rowland, 2002). Therefore, studying empathy when it may be externally constrained (i.e., during fear) helps us understand the role that distinct emotions play during processes that are crucial for fostering cooperation between groups.

Based on previous research on intergroup empathic bias (see Vanman, 2016, for an overview), including my own prior research, I expected 1) overall lower ratings of empathy towards the suffering of outgroup targets compared to the suffering of ingroup targets and 2) based on the findings that incidental emotions increase negativity towards others (Cain, 2012; DeSteno et al., 2004), that fear would exacerbate intergroup bias. It is unclear, however, at this point whether fear would only increase empathy towards the ingroup or only decrease empathy towards the outgroup, or whether it would affect bias in both directions.

To determine how incidental fear affects the direction of intergroup bias, I employed the inclusion of other in the self scale (IOS; Aron, Aron, & Smollan, 1992). I predicted that

the effect of fear exacerbating intergroup bias would be predicted by an increase of 'othering' the outgroup, that is, participants who feel afraid would report less overlap between their sense of self and members of the outgroup.

In this study, I used a minimal group context. Minimal groups are, by nature, devoid of identity content; however, I was keen to determine and control for the possibility that a manipulation of incidental fear might prime group perceptions. Therefore, participants were asked to rate the target groups on a range of attributes that are relevant to intergroup relations and have been shown as key dimensions in intergroup empathic bias (Cikara et al., 2014; Cikara & Fiske, 2011).

Finally, I asked participants to complete implicit measures of fear (IAT; adapted from Greenwald et al., 1998). There are two reasons for this: First, there are a number of social influences that may obscure the accurate expression of fear. For example, in student populations, the admission of fear is deemed socially undesirable by men (Rachman, 2004). Second, outgroups are perceived as inherently threatening (Hewstone et al., 2002) and as a source of anxiety (Dovidio et al., 2002; Mendes et al., 2002; Walter G. Stephan & Stephan, 1985), therefore I wanted to rule out any effect that integral fear might have on empathy, ensuring that the only effects observed in the analyses would be those driven by incidental fear.

5.8 Study 5

5.8.1 Method

Design. The study followed a 2 (event: painful vs. neutral) x 2 (target identity: ingroup vs. outgroup) x 2 (induced fear: fear vs. control) design, with event and perceived identity varied within participants and fear induction varied between participants.

Participants. An a-priori power analysis (G* Power [Version 3.1], Faul, Erdfelder, Buchner, & Lang, 2009) demonstrated that to reach a minimum of 80% estimated power,

under a two-tailed hypothesis and a confidence level of 5%, would require a sample of at least 40 participants in total for a repeated measures design. We therefore aimed to collect data from 80 participants for this study. A total of 80 healthy volunteers were recruited from the University of Exeter and remunerated with £3 or 0.5 course credits for their time. However, two participants withdrew from the study leaving a total sample of 78 participants (M_{age} = 19.42, *SD* = 2.99, 66 female). The study was approved by both the Ethics Committee of the School of Psychology, University of Exeter, and the Ministry of Defence Ethics Committee. Participant consent was obtained according to the Declaration of Helsinki (World Medical Association, 2013).

Stimuli. In each trial of the main task, participants were presented with individuals from one of two groups who were depicted as experiencing either a neutral or painful event (the full details of this paradigm may be found in the Stimuli subsection in Chapter 2, Study 2). To induce fear or not, participants were shown an image that appeared at random during the trials of the main task. To induce fear, half of participants were shown images from the Set of Fear Inducing Pictures database (SFIP; Michałowski et al., 2016) of objects that constitute the most common phobias (e.g., spiders, snakes; described in Appendix E). As a control, the other half of the participants were shown images with a non-fearful, but content-matched, object (e.g., a knitted toy spider). In both conditions, images appeared with a rapid onset and for a brief duration (1000ms). The images were randomly dispersed among trials of the main task with a new sequence generated for each participant.

Measures. To measure the effect of the fear-induction, participants were asked to indicate on a 7-point scale (1 = not at all to 7 = very much) the extent to which they agreed with statements that referred explicitly to their feelings of fear (adapted from Lerner, Small, & Loewenstein, 2013). For example: ‘To what extent do you currently feel afraid?’ The fear subscale consisted of how nervous, anxious, and afraid the participant felt (α = .77) whereas

the positive subscale consisted of how relaxed, peaceful, and calm the participant felt (α = .86). The fear manipulation checks were randomly dispersed amongst the trials.

The fear IAT consisted of 4 blocks. For two blocks, participants were asked to distinguish between ingroup members and outgroup members followed by fear-related words (fear, terror, horror, and panic) and positive-related words (calm, relax, peace, and rest). For a further two blocks, participants were asked to pair ingroup targets with positive-related words and outgroup targets with fear-related words, followed by ingroup targets with fear-related words and outgroup targets with positive-related words. The order of the latter two blocks was counterbalanced between participants.

In the final part of the study, participants were asked to complete measures of the inclusion of other in the self (IOS; Aron, Aron, & Smollan, 1992) as well as measures of perceived group competence (both alphas > .80), sociability (both alphas > .70), and status (both alphas > .70) in relation to both groups and rivalry (α = .87) and similarity (α = .84) in relation to the outgroup only. Participants also completed the interpersonal reactivity index (IRI; Davis, 1980) as part of a broader secondary analysis (see Chapter 6 for further details).

Procedure. After providing written consent, participants were asked to complete a bogus personality test in which they estimated the amount of dots on the screen (Diehl, 1990). The computer then ostensibly analysed the participant's responses and placed them with others according to the similarity of their responses, forming two groups. In reality, group allocation was randomised and counterbalanced between participants. At this point, the researcher re-entered the lab and presented the participant with a coloured bracelet—the colour explicitly referring to the group allocation.

In the main task, participants were asked to observe and respond to photographs of individuals from the two groups, some that depicted people experiencing negative events

(e.g., an injection) others that depicted people experiencing neutral events (e.g., touched by a Q-tip). At the onset of each trial, participants were required to memorise the target's identity (i.e., a member of the red or blue group), observe the event, and then asked to recall the target's group membership in a simple one-back task. Participants were asked to rate the perceived event using one of two self-report items gauging either other-focussed empathy i.e., 'how bad did you feel for the target?' or self-focussed empathy i.e., 'how painful did it seem to you?' (varied within participants, across trials).

At random intervals, throughout the main task, an image would appear that was intended to induce fear, in the fear condition, or not, in the control condition. Also at random, participants were required to answer items that explicitly measured their feelings. Empathy was also measured during the main task, so it was embedded with the fear stimuli. Once participants completed the main task, they were asked to complete a fear IAT, which no longer included the stimuli used to induce fear. In the final section of the study, participants were asked to complete self-report measures referring to their relation to the target groups (IOS) as well as their perception of the target groups, as a whole.

5.8.2 Results

Manipulation check. The fear induction procedure was successful in producing the expected 2 (fear vs. control) x 2 (scale: fear-related vs. positive feelings) interaction, F (1, 76) = 13.38, $p < .001$, $\eta^2 = .15$. That is, participants in the fear condition reported more fear (M = 36.01, SD = 24.91) than participants in the control condition (M = 19.22, SD = 19.84), t (76) = 3.28, p = .002, 95% CI [6.59, 26.98], d =.75, and they reported lower positive feelings (M = 41.08, SD = 23.93) than those in the control condition (M = 57.07, SD = 20.63), t (76) = -3.15, p = .002, 95% CI [5.90, 26.09], d =.72. Of all the items in the fear subscale, the largest difference between the groups was in the extent to which they reported feeling *afraid*, t (76) =

3.41, p = .001, 95% CI [9.77, 37.26], d = .77, compared to *anxious*, t (76) = 2.42, p = .018, 95% CI [2.54, 26.29], d = .55, and *nervous*, t (76) = 2.08, p = .04, 95% CI [.55, 24.33], d = .55.

Recall task. Induced fear did not influence the accuracy, F (1, 76) = .195, p = .660, η^2 = .003, or speed, F (1, 76) = .803, p = .373, η^2 = .010, with which participants identified the target's group membership. Participants were marginally more accurate at identifying ingroup (M = .96, SD = .06) compared to outgroup (M = .95, SD = .06) targets overall, t (77) = 1.79, p = .077, 95% CI [-.001, .020], d = .17, but there was no difference in the time taken to do so, t (77) = .382, p = .704, 95% CI [-44.65, 65.82], d = .03.

Self-focussed empathy. A 2 (fear) x 2 (target) mixed ANOVA revealed a marginal effect of target identity, F (1, 76) = 3.29, p = .073, η^2 = .04. Participants reported ingroup targets (M = 81.58, SD = 18.61) as seeming to be in marginally more pain than outgroup targets (M = 79.42, SD = 18.36), t (77) = 1.82, p = .07, 95% CI [-.21, 4.52], d = .12. There was no main effect of induced fear on self-focussed empathy, F (1, 76) = .070, p = .792, η^2 = .001, nor any interaction between target identity and induced fear, F (1, 76) = .129, p = .72, η^2 = .002.

Other-focussed empathy. There was a significant main effect of target identity on reports of other-focussed empathy, F (1, 76) = 8.00, p = .006, η^2 = .09. Participants reported feeling less bad for outgroup targets in pain (M = 72.60, SD = 17.88) compared to ingroup others in pain (M = 79.04, SD = 14.75), t (77) = -2.83, p = .006, 95% CI [-10.76, -1.88], d = .39. However, this was qualified by a significant interaction between target identity and induced fear, F (1, 76) = 4.52, p = .037, η^2 = .06: Participants in the fear condition reported significantly less empathy for outgroup targets (M = 70.19, SD = 17.34) than ingroup targets (M = 81.25, SD = 13.39), t (77) = -3.55, p = .001, 95% CI [-17.26, -4.85], d = .71, whereas

there was no difference in reports from participants in the control condition, t (77) = -.489, p = .626, 95% CI [-7.93, 4.80], d = .10, (Figure 5.15). There was no main effect of induced fear on other-focussed empathy, F (1, 76) = .004, p = .947, η^2 = .00.

Automatic attitudes towards social groups. The D score was computed using the improved algorithm from Greenwald, Nosek, and Banaji (2003). I computed the mean of correct latencies for each block and the difference between the blocks, then divided them by a pooled standard deviation, and finally averaged the results. A higher D score reflects a stronger bias in favour of the ingroup. There was no difference in automatic attitudes between participants in the fear (M = .53, SD = 1.44) and control (M = .24, SD = 1.21) conditions, t (76) = -.939, p = .350, 95% CI [-.88, .32] on this task, which was completed after (but not during) fear induction.

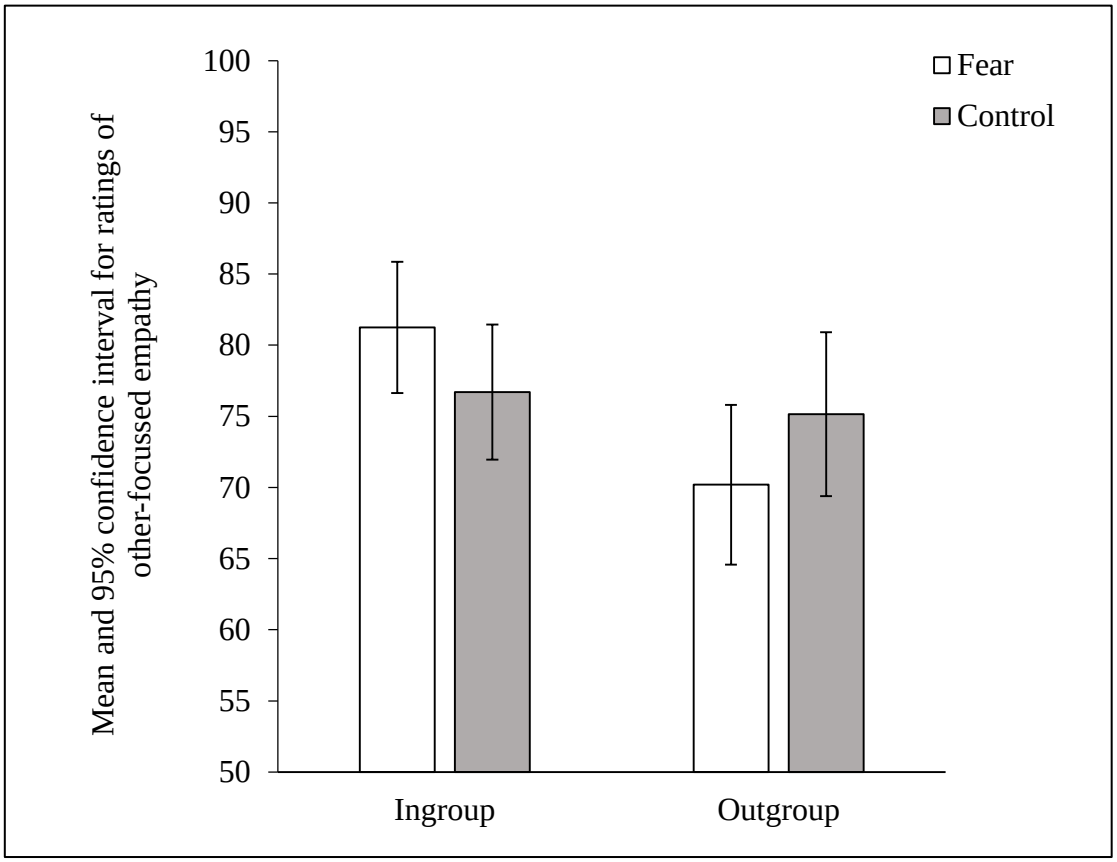

Figure 5.15. Mean self-reported ratings of other-focussed empathy in response to the pain of ingroup and outgroup targets, while receiving cues to induce fear vs. control from Chapter 5, Study 5. Error bars depict the 95% confidence intervals.

Inclusion of other in the self. A 2 (fear) x 2 (target) mixed ANOVA revealed a main effect of target identity on self-other overlap, F (1, 76) = 36.08, $p < .001$, $\eta^2 = .32$. Participants reported feeling more overlap with their ingroup (M = 4.13, SD = 1.54) compared to the outgroup (M = 3.00, SD = .93), t (77) = 5.94, $p < .001$, 95% CI [.75, 1.51], d = .89. However, this was qualified by a significant interaction between target identity and induced fear, F (1, 76) = 4.20, p = .044, $\eta^2 = .05$. Participants in the fear condition perceived less overlap with outgroup others (M = 2.68, SD = .79) compared to non-scared participants (M = 3.34, SD = .94), t(76) = -3.39, p = .001, 95% CI [-1.06, -.28], d = .76, whereas there was no effect of fear on overlap with the ingroup, t (76) = -.27, p = .785, 95% CI [-.79, .60], d = .06. There was no main effect of induced fear on overlap ratings, F (1, 76) = 1.76, p = .189, $\eta^2 = .02$.

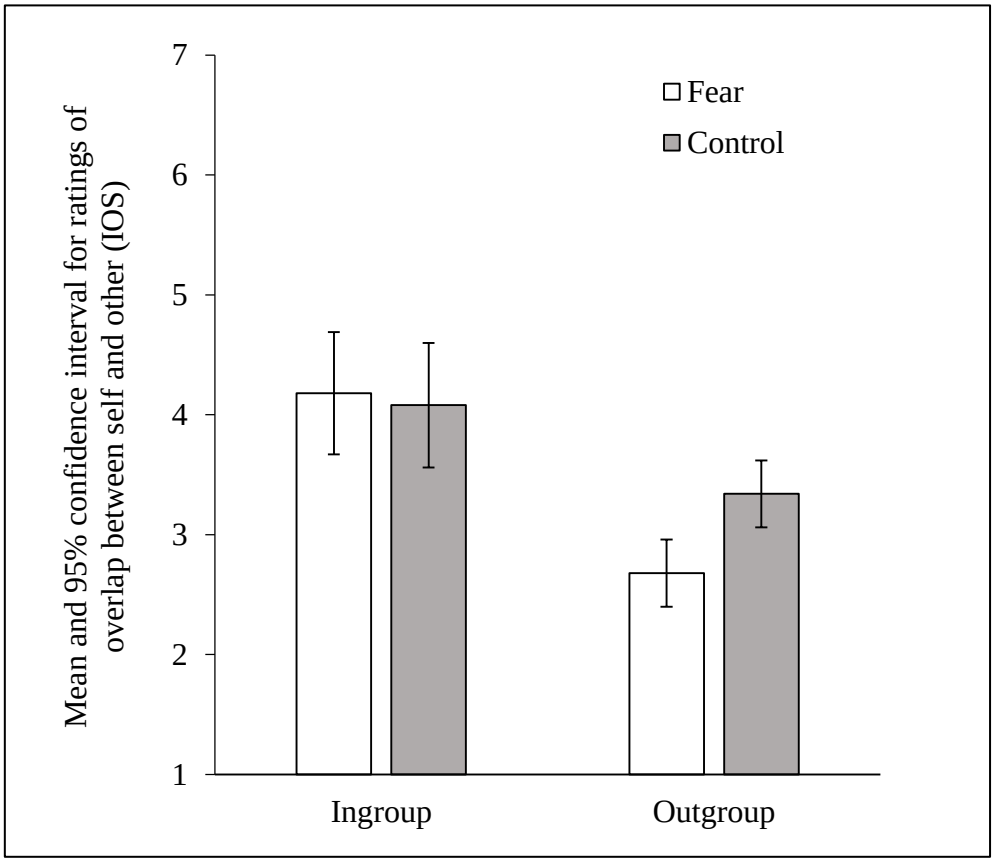

Figure 5.16. Mean self-reported ratings of self-other overlap in response to ingroup and outgroup targets, while receiving cues to induce fear vs. control from Chapter 5, Study 5. Error bars depict the 95% confidence intervals.

Group perceptions. ***Competence and sociability.*** A 2 (fear) x 2 (target) mixed analysis of variance (ANOVA) revealed there was no main effect of target group on ratings of competence, F (1, 76) = 2.80, p = .098, η^2 = .04. There was a significant main effect of induced fear, F (1, 76) = 4.49, p = .037, η^2 = .06. Participants in the fear condition rated targets' competence as lower than those in the control condition, t (77) = -2.12, p = .037, 95% CI [-15.31, -.48], d = .48. There was no interaction between the target identity and induced fear, F (1, 76) = .301, p = .585, η^2 = .004.

There was a main effect of target identity on ratings of perceived sociability, F (1, 76) = 17.99, p < .001, η^2 = .19. Participants rated their ingroup (M = 74.30, SD = 18.04) as significantly more sociable than the outgroup (M = 64.77, SD = 23.21), t (77) = 4.27, p < .001, 95% CI [5.09, 13.99], d = .46. There was also a main effect of induced fear on reports of perceived sociability, F (1, 76) = 5.04, p = .028, η^2 = .06. Participants in the fear condition rated targets sociability as lower than those in the control condition, t (77) = -2.25, p = .028, 95% CI [-17.11, -1.02], d = .55. There was no interaction between target identity and induced fear, F (1, 76) = 1.23, p = .271, η^2 = .016.

Status. There was no main effect of target identity on ratings of perceived status, F (1, 76) = .586, p = .446, η^2 = .016. Participants rated the ingroup (M = 31.36, SD = 27.71) and outgroup (M = 29.36, SD = 25.38), as equal in status, t (77) = .771, p = .443, 95% CI [-3.17, 7.17], d = .08. There was no main effect of induced fear on ratings of perceived status, F (1, 76) = .046, p = .831, η^2 = .001, and no interaction between target identity and induced fear, F (1, 76) = .026, p = .992 η^2 = .00.

Similarity and rivalry. There was no effect of induced fear on reports of the perceived similarity between the ingroup and the outgroup, t (76) = .438, p = .662, 95% CI [-6.93,

10.91], d = .09, nor ratings of perceived rivalry, t (76) = -1.46, p = .148, 95% CI [-22.63, 3.47], d = .33.

Table 5.7. Summary of means, standard deviations, and correlations for scores on perceived competence, sociability, status, similarity with the ingroup, rivalry with the ingroup, self-reported empathy, self-other overlap, and implicit bias score split by the between groups manipulation of the presence of fear stimuli from Chapter 5, Study 5

	Fear												No fear										
Ingroup																							
Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. Competence	70.20	17.31	—									1. Competence	77.25	16.12	—								
2. Sociability	71.09	18.73	.77**	—								2. Sociability	77.68	16.88	.84**	—							
3. Status	30.78	27.88	-.36*	-.25	—							3. Status	31.97	27.89	-.13	-.14	—						
4. Similarity	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—						4. Similarity	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—					
5. Rivalry	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—					5. Rivalry	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—				
6. Other-focussed	81.25	13.39	.29	.33*	-.02	*N/A*	*N/A*	—				6. Other-focussed	76.70	15.90	.23	.25	-.15	*N/A*	*N/A*	—			
7. Self-focussed	80.85	17.29	.17	.26	-.04	*N/A*	*N/A*	.87**	—			7. Self-focussed	82.35	20.12	.15	.11	-.17	*N/A*	*N/A*	.42**	—		
8. IOS	4.18	1.55	.009	.06	.19	*N/A*	*N/A*	.21	.26	—		8. IOS	4.08	1.55	.009	.04	.13	*N/A*	*N/A*	-.12	-.23	—	
9. D	.53	1.44	.09	.11	.14	*N/A*	*N/A*	.05	-.02	0.19	—	*9. D*	.24	1.21	.12	.32*	-.03	*N/A*	*N/A*	.04	.20	-.04	—
Outgroup																							
Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. Competence	66.77	18.77	—									1. Competence	75.51	18.81	—								
2. Sociability	59.14	24.12	.73**	—								2. Sociability	70.68	20.92	.73**	—							
3. Status	28.80	25.84	-.35*	-	—							3. Status	29.95	25.22	-.23	-.32	—						
4. Similarity	66.14	18.09	.58**	.68**	-.49**	—						4. Similarity	68.11	21.49	.26	.35*	-.16	—					
5. Rivalry	32.48	28.34	-.32*	-.37*	.41**	-.37*	—					5. Rivalry	22.89	29.52	-.22	-.41*	.45**	-.21	—				
6. Other-focussed	70.19	17.34	.13	.19	.09	.14	.09	—				6. Other-focussed	75.14	18.33	.002	.17	-.14	.24	-.43**	—			
7. Self-focussed	79.11	17.64	-.003	.03	-.09	.16	.03	.71**	—			7. Self-focussed	79.75	19.33	.10	.26	-.19	.02	-.29	.60**	—		
8. IOS	2.68	0.79	-.02	.001	.27	.07	-.07	.20	.12	—		8. IOS	3.34	0.94	.02	-.06	-.02	-.30	-.04	-.09	.02	—	
9. D	.53	1.44	-.06	.11	-.05	-.08	.18	.07	-.02	.31	—	*9. D*	.24	1.21	.14	.17	.04	.15	-.13	.21	.09	0.21	—

Note: ** correlation is significant at the 0.01 level and * is significant at the 0.05 level (2-tailed)

5.8.3 Discussion

Previous work has shown that fear of a particular group has a moderating effect on the degree to which bias is exhibited against them (Choma et al., 2012; Hodson et al., 2013). Researchers have also demonstrated that negative emotions, such as anger, are sufficient to produce bias against outgroup targets (DeSteno et al., 2004)—that is, when the emotion is incidental to the intergroup context and not directly elicited by the outgroup. The goal of the current study was, first, to determine whether priming incidental feelings of fear would be sufficient to elicit intergroup bias in empathy and, second, to delineate exactly in which direction fear might influence this intergroup bias: whether exclusively in favour of the ingroup or against the outgroup, or towards both at once.

The results of Study 5 show that the manipulation was effective in producing fear. Given the documented link between fear and uncertainty in predicting intolerance (Haas & Cunningham, 2014), I controlled for feelings of uncertainty by having images in the control condition appear randomly and in the same fashion as images in the fear condition. Therefore, I am also confident that the differences between the conditions is only that one induced fear more so than the other, and not that one group also felt more uncertain than the other. Likewise, I measured a variety of fear-related emotions (including nervousness and anxiety) and found that the largest difference between the groups of participants was in how they responded to self-report items of how afraid they felt during the study—producing a stronger effect size than reports of anxiety or nervousness. I note however that fear is closely related to anxiety, and in fact partly overlapping. Where these two emotions differ is in the object of arousal, namely, in whether or not there is a specific object (Rachman, 2004). Fear often describes a reaction to a specific danger (such as a snake) but it dissipates when that source of danger is removed. Anxiety, on the other hand, is more diffuse and does not require a specific object. The source can be objectless and

uncontrollable but often more pervasive (Rachman, 2004). In this case, I am confident that the emotion induced by my procedure is primarily one of fear, while I acknowledge that this might go along with some anxiety as well.

The results of the self-report data show that while there was no effect of induced fear on self-focused empathy (the extent to which participants felt the other's pain) fear exerted a functional influence on empathic-concern (the extent to which participants felt bad for the other in pain). Participants exhibited a bias towards the ingroup, expressing more other-focussed empathy in response to an ingroup target's pain than to an outgroup target's pain. However, the participants who were induced to feel fear exhibited stronger intergroup bias than participants in the control condition. This was driven by a decrease in empathic responses to outgroup targets—as shown by the significant interaction in Figure 5.15. Descriptively, there was a tendency for fear to increase empathy in response to the pain of ingroup members and to decrease empathy towards the pain of outgroup members, but the simple effects reveals that the overall difference between those in the fear condition and those in the control condition was not significant.

To shed further light on the effects of incidental fear, I also explored whether or not the manipulation of fear affected group perceptions. To do so, participants completed measures that have been shown as relevant to intergroup relations and empathic bias (Cikara & Fiske, 2011). Analyses revealed that participants in the fear condition rated outgroup targets as significantly less sociable, less competent, and more of an outgroup (i.e., less overlap with the self) compared to participants in the control condition. The mood induction procedure, however, had no effect on how the ingroup was rated. Where some research suggests that fear operates to enhance positivity towards the ingroup (Bukowski & Dragon, 2014), taken together these findings instead suggest that when we feel afraid we navigate our social world primarily by increasing our distance from the outgroup.

In previous research, incidental negative emotions (i.e., anger) exerted a significant influence on automatic attitudes towards others (DeSteno et al., 2004). I found no evidence that fear had any such influence in Study 5. However, this may be because the mood induction procedure was only present during the main task and did not persist through the explicit or implicit measures of group perceptions. If we consider that fear was induced only during the main block, and that we have no way of determining whether or not it persisted after that, then it is not possible from these results to determine whether or not incidental fear influences implicit attitudes towards outgroup targets.

In Study 6, I sought to replicate the finding that fear exacerbates intergroup bias specifically against the outgroup. I altered minor features of the experimental paradigm, this time ensuring that the mood induction procedure persisted throughout the study. In order to determine whether the effects observed in Study 5 are primarily driven by fear and not by other negative-related emotions, such as disgust—which has been shown to be a significant predictor of negative social evaluations (Choma et al., 2012; Hodson et al., 2013)—I removed any images from the mood induction procedure that may elicit disgust as well as fear (e.g., a fear of spiders is a common phobia not simply because spiders elicit fear but also because they elicit disgust; Davey, 1994).

5.9 Study 6

5.9.1 Method

Design. The study followed a 2 (event: painful vs. neutral) x 2 (target identity: ingroup vs. outgroup) x 2 (induced fear: fear vs. control) design, with the event and perceived identity varied within participants and induced fear varied between participants.

Participants. Using the effect sizes from Study 5, an a-priori power analysis (G* Power [Version 3.1], Faul, Erdfelder, Buchner, & Lang, 2009) demonstrated that replicating

the interaction between target identity and fear manipulation, and to reach a minimum of 80% estimated power, would require a sample of at least 34 participants per cell in a mixed measures design. We therefore aimed to collect data from 68 participants in total for this study.

A total of 68 healthy volunteers were recruited from the University of Exeter and remunerated with £3 or 0.5 course credits for their time. However, three participants withdrew from the study leaving a total sample of 65 participants (M_{age} = 19.57, SD = 3.24, 53 female). The study was approved by both the Ethics Committee of the School of Psychology, University of Exeter, and the Ministry of Defence Ethics Committee. Participant consent was obtained according to the Declaration of Helsinki (World Medical Association, 2013).

Stimuli. The content and format of the stimuli were the same as those used in Study 5, with the exception that I removed images that may induce disgust (e.g., spiders).

Measures. The same measures were used as those in Study 5. To determine whether incidental fear had any effect on real-world outcomes such as political ideologies (as has been previously shown using a mortality salience manipulation, Nail, McGregor, Drinkwater, Steele, & Thompson, 2009) or behavioural outcomes, I included a shortened version of the right-wing authoritarianism scale (Mavor, Louis, & Sibley, 2010) and an optional donation game.[7]

5.9.2 Results

Manipulation check. The mood induction procedure was successful in producing the expected 2 (fear vs. control) x 2 (scale: fear-related vs. positive feelings) interaction, F (1, 63)

[7] The donation game included an entirely voluntary choice of whether or not to donate any money to charity. Not enough of the participants took part in this task to allow for reasonable statistical inferences, therefore these data were not analysed.

= 7.15, p = .01, η^2 = .10. That is, participants in the fear condition reported more fear-related feelings (M = 31.01, SD = 26.34) than participants in the control condition (M = 16.95, SD = 18.36), t (63) = 2.50, p = .015, 95% CI [2.84, 25.29], d =.65, whereas they reported lower positive feelings (M = 41.69, SD = 24.28) than those in the control condition (M = 54.66, SD = 27.11), t (63) = -2.03, p = .047, 95% CI [-25.74, -.20], d =.50. Of all the items in the fear subscale, the largest difference between the groups was in the extent to which they reported feeling *afraid*, t (63) = 2.73, p = .008, 95% CI [4.72, 30.52], d = .68, compared to *anxious*, t (63) = 2.46, p = .017, 95% CI [3.18, 30.54], d = .61, and *nervous*, t (63) = 1.14, p = .258, 95% CI [-5.77, 21.18], d = .28.

Recall task. The induction procedure did not influence the accuracy, F (1, 63) = 1.39, p = .243, η^2 = .02, or speed, F (1, 63) = .336, p = .564, η^2 = .005, with which participants identified the target's group membership. Participants were marginally more accurate at identifying ingroup (M = .95, SD = .09) compared to outgroup (M = .93, SD = .10) targets, t (77) = 1.63, p = .099, 95% CI [-.003, .029], d = .21, and were significantly quicker at identifying ingroup (M = 925.87, SD = 331.430) compared to outgroup (M = 1003.80, SD = 351.423) targets, t (63) = 4.40, p < .001, 95% CI [-113.56, -42.66], d = .23.

Self-focussed empathy. A 2 (event) x 2 (fear) x 2 (target) mixed ANOVA revealed a strong main effect of event, F (1, 63) = 689.82, p <.001, η_p^2 = .92: Participants reported the painful events to seem more painful (M = 79.62, SD = 20.36) than neutral events (M = 7.18, SD = 11.84), t (63) = 26.27, p < .001, 95% CI [66.94, 77.96], d = 4.35. A main effect of target identity also emerged, F (1, 63) = 49.62, p < .001, η^2 = .44. Participants reported ingroup targets (M = 83.55, SD = 19.00) as seeming to be in more pain than outgroup targets (M = 75.67, SD = 20.36), t (63) = 7.05, p < .001, 95% CI [5.66, 10.14], d = .40. As in Study 5, there was no main effect of induced fear on self-focussed empathy, F (1, 63) = .148, p =

.702, $\eta^2 = .002$, nor any interaction between target identity and induced fear, F (1, 63) = .921, p = .341, $\eta^2 = .014$.

Other-focussed empathy. There was a strong main effect of event on other-focussed empathy, F (1, 63) = 484.42, p <.001, $\eta_p^2 = .89$: Participants reported the painful events to seem more painful (M = 70.83, SD = 7.18) than neutral events (M = 9.86, SD = 14.22), t (63) = 22.01, p < .001, 95% CI [55.44, 66.51], d = 5.41. There was a significant main effect of target identity on reports of other-focussed empathy, F (1, 63) = 9.66, p = .003, $\eta^2 = .13$. Participants reported feeling less bad for outgroup targets in pain (M = 68.86, SD = 20.88) compared to ingroup others in pain (M = 72.92, SD = 17.94), t (63) = -3.11, p = .003, 95% CI [-6.74, -1.46], d = .21. This was qualified by a marginally significant interaction between target identity and induced fear, F (1, 63) = 3.31, p = .074, $\eta^2 = .05$. Participants in the fear condition reported significantly less empathy for outgroup targets (M = 63.84, SD = 7.23) than ingroup targets (M = 70.34, SD = 7.18), t (63) = -3.46, p = .001, 95% CI [-10.26, -2.74], d = .90, whereas there was no difference in reports from participants in the control condition, t (63) = -.918, p = .362, 95% CI [-5.40, 1.99], d = .07. There was no main effect of induced fear on other-focussed empathy, F (1, 63) = 2.67, p = .108, $\eta^2 = .04$.

Automatic attitudes towards social groups. There was no difference in automatic attitudes between participants in the fear (M = .56, SD = 1.06) and control (M = .57, SD = 1.31) conditions, t (63) = -.031, p = .975, 95% CI [-.60, .58].

Inclusion of other in the self. There was a main effect of target group on self-other overlap, F (1, 63) = 21.10, p < .001, $\eta^2 = .25$. Participants reported feeling more overlap with their ingroup (M = 3.33, SD = 1.87) compared to the outgroup (M = 2.48, SD = 1.72), t (63) = 4.58, p < .001, 95% CI [.48, 1.22], d = .47. There was a marginal main effect of induced fear on overlap ratings, F (1, 63) = 3.88, p = .053, $\eta^2 = .06$, participants in the fear condition

perceived more overlap with others (M = 3.29, SD = 1.99) compared to participants in the control condition (M = 2.52, SD = 1.65), t (63) = 1.97, p = .053, 95% CI [-.01, 1.58, d = .42. There was no interaction between target identity and induced fear, F (1, 63) = .428, p = .515, η^2 = .007.

Group perceptions. ***Competence and sociability.*** There was no main effect of target group on ratings of competence, F (1, 63) = 2.33, p = .132, η^2 = .04. There was also no effect of induced fear, F (1, 63) = .223, p = .638, η^2 = .004, nor an interaction between the target identity and induced fear, F (1, 63) = .078, p = .781, η^2 = .001.

There was a main effect of target identity on ratings of perceived sociability, F (1, 63) = 5.12, p = .027, η^2 = .08. Participants rated their ingroup (M = 63.76, SD = 15.81) as significantly more sociable than the outgroup (M = 58.23, SD = 19.39), t (63) = 2.26, p = .027, 95% CI [.63, 10.09], d = .31. There was no main effect of induced fear on reports of perceived sociability, F (1, 63) = .035, p = .852, η^2 = .001, nor was there an interaction between target identity and induced fear, F (1, 63) = .030, p = .863, η^2 = .00.

Status. There was a main effect of target identity on ratings of perceived status, F (1, 63) = 10.64, p = .002, η^2 = .15. Participants rated the outgroup (M = 61.26, SD = 27.66) as significantly higher in status than the ingroup (M = 38.74, SD = 27.65), t (63) = 3.26, p = .002, 95% CI [8.74, 36.36], d = .81. There was no main effect of induced fear on ratings of perceived status, F (1, 63) = .001, p = .998, η^2 = .000, and no interaction between target identity and induced fear, F (1, 63) = .065, p = .800 η^2 = .001.

Similarity and rivalry. There was no effect of induced fear on reports of the perceived similarity between the ingroup and the outgroup, t (63) = -1.19, p = .240, 95% CI [--18.99,

4.84], d = .29, nor ratings of perceived rivalry, t (63) = -.354, p = .724, 95% CI [-18.35, 12.82], d = .09.

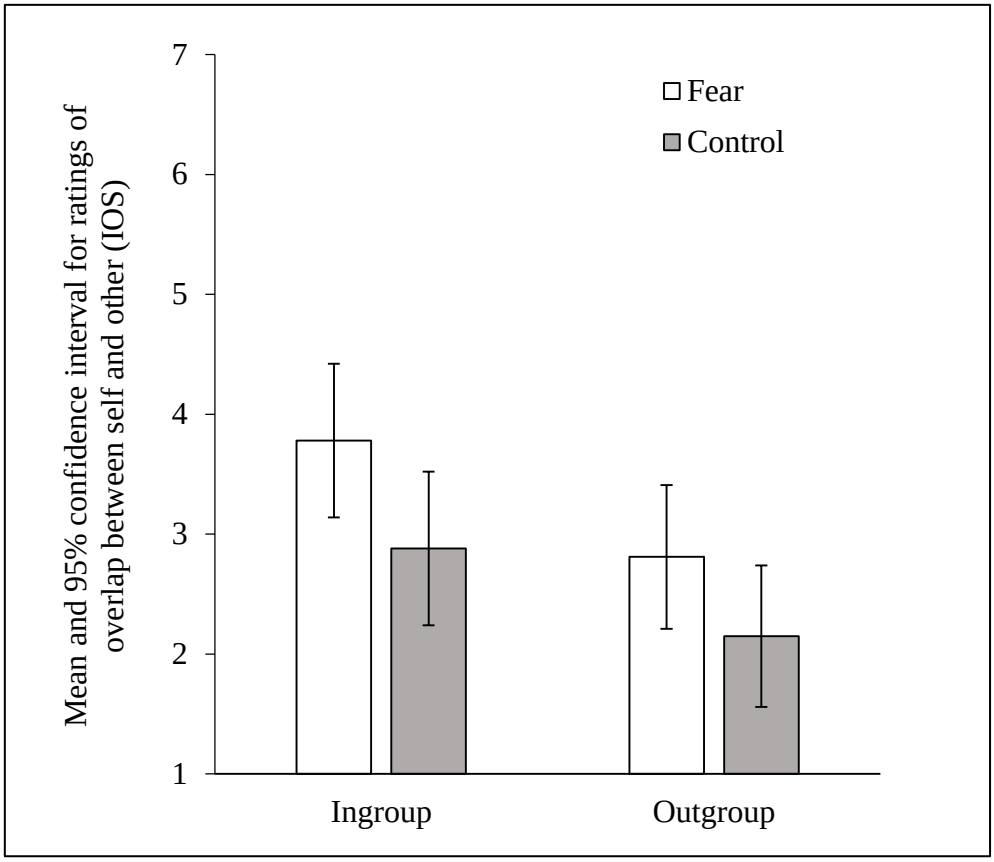

Figure 5.177. Mean self-reported ratings of self-other overlap in response to ingroup and outgroup targets, while receiving cues to induce fear vs. control from Chapter 5, Study 6. Error bars depict the 95% confidence intervals.

Table 4.8. Summary of means, standard deviations, and correlations for scores on perceived competence, sociability, status, similarity with the ingroup, rivalry with the ingroup, self-reported empathy, self-other overlap, and implicit bias score split by the between groups manipulation of the presence of fear stimuli from Chapter 5, Study 6

	Fear												No fear										
												Ingroup											
Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. Competence	63.59	23.51	—									1. Competence	66.30	19.91	—								
2. Sociability	63.76	15.81	.24	—								2. Sociability	63.43	18.86	.75**	—							
3. Status	37.84	23.90	.25	.12	—							3. Status	39.61	31.22	.22	.18	—						
4. Similarity	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—						4. Similarity	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—					
5. Rivalry	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—					5. Rivalry	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	*N/A*	—				
6. Other-focussed	70.34	17.18	.03	-.22	-.004	*N/A*	*N/A*	—				6. Other-focussed	75.32	24.11	-.03	.23	-.22	*N/A*	*N/A*	—			
7. Self-focussed	85.03	12.59	.56**	.26	-.10	*N/A*	*N/A*	.06	—			7. Self-focussed	82.12	23.75	-.16	.13	-.21	*N/A*	*N/A*	.95**	—		
8. IOS	3.78	1.99	.07	.31	.28	*N/A*	*N/A*	-.31	.04	—		8. IOS	2.88	1.65	.35*	.52**	.34	*N/A*	*N/A*	.25	.12	—	
9. D	.56	1.06	-.14	.08	.03	*N/A*	*N/A*	-.45*	-.09	.29	—	*9. D*	.57	1.31	-.04	-.06	-.13	*N/A*	*N/A*	-.04	-.05	.03	—
												Outgroup											
Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	Measure	*M*	*SD*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
1. Competence	59.97	20.15	—									1. Competence	61.06	15.80	—								
2. Sociability	58.81	16.93	.86**	—								2. Sociability	57.67	21.77	.76**	—							
3. Status	62.16	23.90	.31	.23	—							3. Status	60.39	31.22	.19	.09	—						
4. Similarity	60.53	26.25	.27	.36*	.23	—						4. Similarity	67.61	21.67	.21	.15	.52**	—					
5. Rivalry	35.81	31.44	.14	.04	-.27	-.37*	—					5. Rivalry	38.58	31.43	-.39*	-.39*	-.69**	-.55**	—				
6. Other-focussed	63.84	7.23	.29	.20	.11	.12	.06	—				6. Other-focussed	73.72	27.78	.29	.38*	.39*	.22	-.34	—			
7. Self-focussed	76.06	13.01	.190	.26	.14	.05	-.15	.21	—			7. Self-focussed	75.29	25.79	.30	.29	.33	.22	-.29	.93**	—		
8. IOS	2.81	1.96	.37*	.21	-.11	.15	.06	.13	.08	—		8. IOS	2.15	1.39	-.09	-.08	-.03	-.26	.29	.12	.16	—	
9. D	.56	1.06	.10	.11	-.03	.12	-.09	-.13	.008	.30	—	*9. D*	.57	1.31	.20	.33	.13	.17	-.16	.02	-.05	.08	—

Note: ** correlation is significant at the 0.01 level and * is significant at the 0.05 level (2-tailed)

5.9.3 Discussion

The goal of the current study was to replicate the finding that fear exacerbates intergroup bias specifically against the outgroup, while controlling for other factors that can drive negativity towards outgroups (i.e., disgust). The results revealed that, as in Study 5, participants felt worse while viewing ingroup members in pain than viewing outgroup members in pain. There was also an interaction between the identity of the target and induced fear on self-reported empathy for the other, although this time it was only marginally significant. Specifically, participants felt less empathy towards the pain of an outgroup member than an ingroup member, but only if they were exposed to images designed to prime fear.

Participants rated the ingroup as more sociable than the outgroup, and the outgroup as higher status than the ingroup, regardless of the fear induction procedure. Participants felt more overlap with the ingroup than the outgroup, but when primed to feel fear they reported more general overlap with others (regardless of the target's group membership). In Study 5, there was a clear tendency for fear to drive negative evaluations of the outgroup (less sociable, less competent, and less overlap with the self) but in Study 6 fear had no such effect. The largest difference between Study 5 and Study 6 is that in Study 6, the induction procedure persisted throughout measures of group perceptions and I controlled for the possibility that the induction procedure might elicit feelings of disgust. In this case, it is possible that in Study 5 negative evaluations of the outgroup were driven by feelings of disgust. This is consistent with research that demonstrates the moderating effect disgust has in predicting negative social evaluations (Choma et al., 2012; Hodson et al., 2013).

5.9 Conclusion

Across two studies I show, for the first time, that priming incidental feelings of fear is sufficient to elicit intergroup bias in empathy, specifically against the outgroup (i.e., reduced

empathy for outgroup targets), rather than increased empathy for ingroup targets. This is consistent with previous research showing that whether or not the outgroup is truly responsible for our feelings of fear, we exhibit prejudice towards them as if they are (Cain, 2012; Choma et al., 2012; Hodson et al., 2013). It is also consistent with previous accounts that show that fear of the outgroup's encroachment on 'us' precedes increases in derogation and prejudicial practices against 'them' (Quillian, 1995).

Interestingly, these findings speak to recent documented cases where, following a terrorist attack, communities and nations come together and exhibit extraordinary solidarity with one another. For example, following the 2017 attack in Manchester (England) tributes were held across Europe, Asia, Australia, Canada, and America, in a coming together in 'solidarity with the people of Manchester' (Yarwood, 2017). This highlights a re-categorisation from 'us' as individual nations to 'us' as possible victims to terrorism. But, that shift in solidarity is wedded to an up-rise in a collective opposition to 'them'. For example, following the attack in the UK national leaders expressed a strengthened resolve to work together against those who 'execute such inhuman acts' (Henley, 2017). Together with my findings, this demonstrates that beneath an exterior of ingroup love and solidarity is a pernicious prejudice towards the groups associated with the perpetrators of terror attacks. The notion of a group, however, is a moving target. When people are afraid they perceive the world not in terms of one's racial, cultural, or national group memberships but simply in terms of 'us' and 'them'.

6 The Role of Individual Differences in Intergroup Empathy

Empathy is an important social glue that helps personal relationships and social bonds to form and endure in a variety of contexts (Baron-Cohen & Wheelwright, 2004). But individuals vary markedly in their ability to empathise with another's suffering. Indeed, one scholar suggests that an individual's capacity for empathy may be represented along a bell curve starting at 'level 0,' where the individual has no empathy at all, to 'level 6,' where the individual is hypervigilant of another's emotions (Baron-Cohen, 2011). Empathy also appears to ebb and flow according to a variety of contextual factors, such as when sharing another's burden comes with a cost (Shaw, Batson, & Todd, 1994) or when it interferes in competing during intergroup conflict (Cikara & Paluck, 2013). But what determines our capacity for empathy? And to what extent do individual differences affect our tendency to exhibit empathy towards some people more than others? In this chapter, I consider two perspectives, one that suggests empathy is fixed, a hardwired product of our biology and genetics; the other, that empathy is fluidly determined by our goals and motivations. I present a 'mini meta-analysis', using data from the studies outlined in this thesis, to demonstrate that regardless of individual differences people respond to another's pain on the basis of a shared group membership, empathising more with the pain of an ingroup member than an outgroup member.

6.1 Empathy Is Hard-wired

To some extent, our capacity for empathy is determined by factors that are not within our control. For example, individuals with a clinical diagnosis of psychopathy or autistic spectrum disorder commonly suffer deficits in specific facets of empathy (perspective-taking and empathic concern, respectively; Jones, Happé, Gilbert, Burnett, & Viding, 2010). Likewise, Marsh and colleagues (2014) identified that one's biological make-up determines

why a certain minority of people seem to be drawn to helping others when it seems to come at a significant cost to themselves. Using structural and functional magnetic resonance imaging (fMRI), researchers scanned the brains of people who had previously donated a kidney to a stranger (people whom the researchers termed 'extraordinary altruists'). Researchers found that they could distinguish the brains of extraordinary altruists from control participants by the enhanced volume of a particular region of the limbic system (a system that is thought to have evolved in early mammals), the right amygdala. Correlative evidence demonstrates that the amygdala is most commonly associated with emotional processing and is generally smaller in individuals who have a disorder that is characterised by low empathy (i.e., psychopathy; Pardini, Raine, Erickson, & Loeber, 2014). Marsh and colleagues concluded that extraordinary altruism (i.e., acts of self-sacrifice that have no conceivable gains) is indeed a product of our biology, that caring for other's welfare is determined by rigid ancient mammalian neural architectures that promote evolutionary processes such as kin selection and reciprocity. Enhanced volume within these neural structures also relates to how we rate our own capacity for empathy, at a trait level (Banissy, Kanai, Walsh, & Rees, 2012).

The interpersonal reactivity index (IRI; Davis, 1980) is a well-known measure of trait empathy that consists of several subscales. These are Personal Distress (PD; the degree to which people feel anxiety while observing other's negative experiences), Empathic-Concern (EC; the tendency to have sympathetic feelings towards others), Perspective-Taking (PT; the ability to take the perspective of others), and Fantasy (FS; the tendency to identify with fictional characters). People who typically score high on the IRI are more likely to behave pro-socially towards others (e.g., by helping victims of bullying) compared to those who score low on it, who behave more antisocially towards others (e.g., by perpetrating bullying; Gini, Albiero, Benelli, & Altoe, 2007). Crucially, researchers found that scores on this scale

relate to one's physiological responses to another's pain. Specifically, individuals who score higher on the EC subscale of the IRI exhibit more muscular activity associated with grimacing (Sun, Wang, Wang, & Luo, 2015) and activity in brain regions associated with empathy (Singer et al., 2004) when viewing another person in pain, than an individual who scores lower on the IRI. People who score higher on the IRI also have structurally larger volume in brain regions associated with empathy, compared to those who score lower on the IRI (Banissy et al., 2012). Specifically, scores on the PD and EC subscales correlate positively with grey matter volume in the insula cortex whereas scores on the PT subscale correlate with volume in the anterior cingulate, and scores on the FS subscale with volume in the dorsolateral prefrontal cortex. These findings suggest that our propensity to empathise with another's pain is determined by the development of our underlying biology, and to a certain extent, this is passed down in our genetic makeup.

In a recent and large-scale meta-analysis researchers sought to demonstrate the extent to which one's genetic inheritance can predict performance on a test of cognitive empathy (Warrier et al., 2017). Participants were asked to complete the 'Reading the Mind in the Eyes' task (Baron-Cohen, Jolliffe, Mortimore, & Robertson, 1997). This task involves identifying the emotions or mental states of another person using photographs that show only the other's eyes. In a sample of over 88,000 individuals, researchers found that women performed slightly better than men in the 'Eyes test,' but there was no significant difference between men and women in the extent to which this was explained by genetic inheritance. Furthermore, using a separate sample of twin individuals (N = 749), researchers found that roughly 28% of the variance in performance on the Eyes test was inherited through genetics. This suggests that to some extent one's capacity for empathy is handed down through genetics: Roughly a third of one's ability to infer emotions from another's expressions is inherited through our biological make-up and being female appears to provide an advantage

over males. However, given that there was no difference in heritability between men and women and, in twins, only a third of variance in cognitive empathy was explained by genetic inheritance, it seems likely that cognitive empathy is also influenced by experiences encountered in the social world. Indeed, there is newly emerging evidence that empathy can be trained (Teding van Berkhout & Malouff, 2016) and ample evidence that empathy can be flexibly recruited according to the situational needs and motivations of the individual, such as the expectations or demands about how we should behave towards others.

6.2 Empathy Is Socially Constructed

Women are perceived to be more empathic than men (Pinker, 2009). As previously highlighted, women outperform men in cognitive measures of empathy, respond more to others' distress (Davis, 1983), exhibit more sensitivity to others' facial expressions (Hall & Matsumoto, 2004), and attend more towards others' thoughts than men do (Baron-Cohen, Wheelwright, Hill, Raste, & Plumb, 2001). However, these differences do not necessarily reflect a greater innate capacity for empathy in women compared to men, they can also reflect differences in their social motivations. One team showed that the only occasions when men and women differed in empathy ratings was when measurement followed gender-role priming (Ickes, Gesn, & Graham, 2000; Klein & Hodges, 1993; Laurent & Hodges, 2009). Indeed, women routinely self-report being more empathic than men, but when you remove the filter of response control, and measure empathy using implicit measures, the difference between men and women disappears (Eisenberg & Lennon, 1983). In terms of the biological architecture that supports cognitive processes such as empathy, there is always overlap between males and females 'confirming that the human brain cannot…be described as sexually dimorphic' (Ritchie et al., 2017, p. 8). Differences between men and women emerge only when gender-based expectations are made salient that women should be empathic and men should not (Cross & Madson, 1997).

Consistent with a motivational account of gender-based differences in empathy, Thomas and Maio (2008) found they were able to eliminate the empathy-gender gap by persuading male participants of the value of empathy-relevant aspects of a traditional feminine gender role. The researchers suggested to heterosexual male participants that a man who is in touch with his feminine side is more attractive to women—thereby making empathy more compatible with male identity. Participants who received this message were more accurate in a task that involved perspective-taking than participants who were either challenged to debunk the stereotype that men are less empathic or were given no message at all. This suggests that rather than being hard-wired, empathy can at least temporarily be altered according to a situation.

One's capacity for empathy can also be changed more permanently, at a trait level. Individuals who dedicate their lives to the caring of others, for example as physicians, have a natural gift for tuning into how others are feeling (characterised as 'level 6' on Baron-Cohen's empathy curve, 2012). But at some point during training to become physicians that appears to change drastically. In a 3-year longitudinal study, researchers found that while naturally high levels of empathy may draw individuals to begin training in medicine, they suffer a substantial decline in empathy in their final year (Hojat et al., 2009). Intuitively, one can see why that might happen: Whether during surgery, drawing blood, or delivering news of terminal illness, the job of being a physician requires inflicting pain on others. The last thing you want to do in those circumstances is to feel suffering *with* the patient (i.e., experience-sharing); to wince when cutting into them with a scalpel. Likewise, it would be detrimental for physicians to always feel *for* their patients (i.e., empathic concern). Doing so leads to what healthcare workers refer to as 'burnout' or compassion fatigue (Abendroth, 2006; Lombardo & Eyre, 2010; Mathieu, 2007; Sabo, 2006). Of course, a physician needs to be in tune with their patient's suffering (to assess how much pain their patients are in) and

they need to exhibit a caring bedside manner, but being *too* empathic in these ways can hamper a physician's ability to treat their patient. To curtail the stress that accompanies persistent empathy, healthcare workers dehumanise their patients and assess their pain only in terms of primary emotions (Vaes & Muratore, 2013). This, however, denies patients of their humanity and can result in the treatment of others as cold, unfeeling machines (Haslam, 2006) and can give rise to acts that would otherwise be considered harmful (Bandura, 2002; Bandura et al., 1975).

The above research points to the notion that empathy is not necessarily the product of innate differences between individuals but a product of our motivations. Zaki (2014) makes a compelling case for this, suggesting that empathy is not a static phenomenon but one to that we may approach or avoid according to the features of our situation, our experiences, and our relationships to others. This can include whether the situation is perceived to be costly either in terms of affective burden (such as in the case of the physician and their suffering patient) or when empathy is expected or desired (such as in the case of women being stereotyped as caring and maternal). But regardless of who we are, or who we perceive ourselves to be, we all adapt our empathic processing from time to time.

6.3 Approaching and Avoiding Empathy

There are many reasons for why we might approach or avoid empathy; for example, we might want to broadcast our understanding while consoling a grieving friend. On the other hand, we might want to avoid the negative affect that we might catch while interacting with someone in dire straits, for example, someone who lives on the street. Empathy is a fluid emotion—sometimes it's a useful tool to understand others, other times it can get in our way.

Empathy reduces the chance of achieving success in negotiations (Galinsky, Maddux, Gilin, & White, 2008). For people who score highly on trait narcissism, it's particularly easy

to avoid feeling bad for opponents because getting ahead is more important to them than getting along (Bradlee & Emmons, 1992). Empathy can also reduce our chance of success during intergroup competitions (Cikara & Paluck, 2013). Feeling what one's opponent feels is not motivationally congruent with the desire to get ahead of them, particularly when getting ahead means having to inflict harm upon the other for example, throwing a punch in a boxing match or delivering a brutal tackle in rugby or football.

In a competitive context, members of our team help us achieve success but members of the other team stand in our way, therefore we feel more empathy for 'us' (the ingroup) than we do for 'them' (the outgroup)—this is referred to as 'empathic bias' (for a review see Vanman, 2016). Empathic bias can take a variety of forms from simply feeling disregard when a member of an outgroup suffers a negative event (Stürmer et al., 2006, 2005) to feeling joy at the sight of it (i.e., Schadenfreude; Cikara, Botvinick, et al., 2011; Hein et al., 2010; Leach et al., 2003).

6.4 Intergroup Empathy

The tendency to show preference towards members of our group over members of other groups is explained by notions from the social identity theory (SIT; Tajfel & Turner, 1979). This theory suggests that behaviour can be represented in terms of a bipolar continuum. At the interpersonal pole, behaviour is determined by the character and motivations of the individual, as an individual, and at the opposite intergroup pole behaviour is determined by an individual's group memberships. Social identity becomes an integral aspect of an individual's sense of 'who they are.' As a consequence, individuals perceive themselves not in terms of individual characteristics but as members of a group ('us'), which they are motivated to perceive as different from, and as better than, other groups ('them'). SIT asserts that we must do more than study the psychology of individuals as individuals, but

must understand how, when, and why individuals define themselves in terms of their group memberships and how these memberships affect behaviour. In line with these notions, I am interested in how differences in empathy at the individual level influence the biases in empathy that we exhibit at the collective level. Does the manner by which we construct a personal identity through interpersonal processes, such as empathy, interact with our behaviour in an intergroup context?

Some research points towards the importance of individual attitudes in shaping collective level affect, such as one's commitment (Totterdell, 2000; Totterdell, Kellett, Teuchmann, & Briner, 1998) and identification with the group (Tanghe, Wisse, & van der Flier, 2010). Likewise, scores on the emotional contagion scale (Doherty, 1997), which has items such as 'Being with a happy person picks me up when I'm down,' have a moderating effect on individual capacity to share state affect with fellow members of a team (Ilies, Wagner, & Morgeson, 2007). In one unpublished study, Pearson and Dovidio (2008) found that participants who scored higher in the EC subscale of the IRI showed less empathy towards the perpetrator of a physical assault, compared to participants who scored low in EC. However, this was only the case when the perpetrator was a member of an outgroup (a fan of a rival sports team) and not a member of the salient ingroup (a fan of the team that the participant supported).

Intuitively, one might expect that being more empathic at a personal level means one should be more resonant with others' pain and suffering, regardless of who the other is and which groups they belong to. However, interpersonal and intergroup behaviour is guided by slightly different motives. Indeed, one can pursue the individual goal of living and treating others without prejudice, but this can interfere with a collective goal of achieving success in intergroup competition. It is likely, then, that the manner by which we construct a personal

self will drive our overall levels of empathy but will have little or no effect on the biases we exhibit at the collective level.

6.5 This Study

Very little research has been conducted that focuses on the role of individual differences in intergroup empathy. The studies that do include a measure of trait empathy often do so only as a side note (e.g., see Azevedo et al., 2013; Mathur et al., 2010; Montalan et al., 2012; Singer et al., 2004) and the findings are inconsistent with regards to which subscale relates with behavioural empathy. For example, Montalan, Lelard, Godefroy, and Mouras (2012) found the degree of behavioural empathy bias in favour of one's ingroup was related to scores on the EC subscale, whereas Mathur and colleagues (2010) found it was related to scores on PT subscale. It is unclear whether and how trait empathy influences behavioural responses to the pain of an ingroup and outgroup member.

To determine whether scores on measures of trait empathy have any bearing on intergroup empathic bias, I asked participants to complete the IRI (Davis, 1980) following a task involving self-reported empathy towards ingroup and outgroup targets. I collected responses across six separate studies (reported in full in the preceding chapters of this thesis) and present the data here in a set of 'mini' meta-analyses. 'Mini-metas' use the same statistical approach as any meta-analysis but can be run on as few as two datasets. The goal of a mini-meta is to draw attention towards effect sizes and away from p-values, highlighting the 'bottom line' of a set of studies within a manuscript (Goh, Hall, & Rosenthal, 2016). Using the approach described in the primer by Goh and colleagues (2016), I used mini-metas to demonstrate support for the hypothesis that, regardless of how participants self-report their own trait empathy, a shared group membership will confer an empathic advantage when responding to another's pain. Specifically, I expected that there would be a positive

relationship between ratings of trait empathy and empathic responding to other's pain overall, but I expected that there would be no significant relationship between ratings of trait empathy and scores of empathic bias. I also present a mini meta-analysis to show that, over the course of six studies, gender had no predictive effects on the extent to which participants expressed empathy towards another's suffering.

6.5.1 Results

Gender. Gender differences were calculated using independent t-tests. Gender was coded as 0 = male and 1 = female, and any effect size with positive value would therefore indicate that women self-reported more empathy than men, and any effect size with negative value would indicate that men self-reported more empathy than women.

To produce a summary effect size for the effect of gender on self-reported empathy for each study, I calculated Cohen's *d* using Formula 2 from Goh et al. (2016) for non-equal group sizes:

$$d = \frac{t\ (n1 + n2)}{\sqrt{df}\ \sqrt{n1\ n2}}$$

I converted *d* scores to *r* using Formula 4 from Goh et al. (2016), where *P* refers to the proportion of the sample in one group (e.g., number of females divided by the total sample size) and *Q* refers to the proportion of the sample in the other group (e.g., number of men divided by the total sample size):

$$r = \sqrt{\frac{d^2}{d^2 + \frac{1}{P * Q}}}$$

I then used Formula 5 to create a single weighted mean from the *r* scores:

$$Weighted\ \overline{r_z} = \frac{\sum([N-3]\ r_z)}{\sum(N-3)}$$

Finally, to create a summary *Z*-score for all of the studies in each analysis I used Stouffer's formula (Mosteller & Bush, 1954) where *k* refers to the number of independent *Z* scores being combined:

$$combined\ Z = \frac{\sum Z}{\sqrt{k}}$$

The results revealed that there were no differences between female and male participants in self-reported empathy in any of the studies, across the studies combined, or for any of the targets.

Table 6.1. Summary of results from the meta-analysis on participant sex outlined in Chapter 6

Summary of participant demographics in each study

		Gender	Age	
	N	f : m	*M*	*SD*
Study 1	41	30 : 11	19.68	0.81
Study 2	64	46 : 18	19.89	2.42
Study 3	39	26 : 13	19.25	1.24
Study 4	69	42 : 27	20.57	3.04
Study 5	78	66 : 12	19.42	2.99
Study 6	65	53 : 12	19.57	3.24

Gender differences in empathy towards others (ingroup + outgroup targets)

	N	*t*	*df*	*p*	Cohen's *d*	*r*
Study 1	41	-0.353	39	.726	-0.11	.06
Study 2	64	-0.079	62	.938	-0.02	.01
Study 3	39	0.014	37	.989	0.00	.00
Study 4	69	0.191	67	.849	0.05	.02
Study 5	78	-0.664	76	.509	-0.15	.08
Study 6	65	0.321	63	.749	0.08	.04
M r_z						.03
M r						.03
Combined Z						0.68

Gender differences in empathy towards ingroup targets						
Study 1	41	0.516	39	.609	0.17	.08
Study 2	64	-0.453	62	.652	-0.12	.06
Study 3	39	0.116	37	.909	0.04	.02
Study 4	69	0.581	67	.563	0.14	.07
Study 5	78	-0.631	76	.530	-0.14	.07
Study 6	65	0.609	63	.544	0.15	.08
M r_z						.06
M r						.06
Combined Z						1.21
Gender differences in empathy towards outgroup targets						
Study 1	41	-0.567	39	.574	-0.18	.09
Study 2	64	0.14	62	.889	0.04	.02
Study 3	39	-0.245	37	.808	-0.08	.04
Study 4	69	-1.37	67	.174	-0.33	.17
Study 5	78	-0.581	76	.563	-0.13	.07
Study 6	65	.053	63	.958	0.01	.01
M r_z						.04
M r						.04
Combined Z						1.26
Gender differences in intergroup empathic bias (ingroup – outgroup)						
Study 1	41	1.08	39	.287	0.35	.17
Study 2	64	-1.22	62	.226	-0.31	.15
Study 3	39	0.117	37	.908	0.04	.02
Study 4	69	1.07	67	.291	0.26	.13
Study 5	78	-0.06	76	.954	-0.01	.01
Study 6	65	.912	63	.365	0.23	.11
M r_z						.08
M r						.08
Combined Z						1.82^{+}

Note: In all analyses, men were coded as 0 and women as 1Correlations in the last column were calculated from *t* values using Formula 3. *M* r_z = weighted mean correlation (Fisher's *z* transformed). M *r* = weighted mean correlation (converted from r_z to *r*). Positive Cohen's *d* and positive correlation coefficients indicate that more empathy is shown for ingroup, compared to the outgroup, pain. ^{+}p =.06, two-tailed.

Trait empathy. The steps outlined above were also used to analyse the relationship between scores on measures of trait empathy and behavioural ratings, with the exception that the scores were already correlations, therefore the conversion between *d* and *r* was not

necessary. The results revealed that there was a significantly positive relationship between scores on three subscales of the IRI (Empathic Concern, Personal Distress, and Fantasy) and self-reported empathy for targets from the ingroup and the outgroup. There was no however no relationship between scores on any subscale of the IRI and scores of empathic bias (i.e., ingroup – outgroup).

Table 6.2. Summary of results from the meta-analysis on trait empathy outlined in Chapter 6

	N	Empathic Concern	Perspective Taking	Personal Distress	Fantasy
Correlations between empathy towards others (collapsed responses to both ingroup and outgroup targets) and scores on the IRI					
Study 2	64	-.11	.04	.06	.03
Study 4	69	.54	.08	.27	.44
Study 5	78	.43	.12	.27	.38
Study 6	65	.17	.19	.15	-.07
M r_z		.36	.09	.23	.33
M r		.35	.09	.23	.32
Combined Z		4.39***	1.79*	3.16***	3.34***
Correlations between ratings of empathy towards ingroup targets and scores on the IRI					
Study 2	64	-.09	-.03	.09	.02
Study 4	69	.50	-.01	.26	.42
Study 5	78	.49	.19	.19	.41
Study 6	65	.15	.24	.13	-.08
M r_z		.39	.09	.19	.34
M r		.37	.09	.19	.33
Combined Z		4.49***	1.64	2.80**	3.31***
Correlations between ratings of empathy towards outgroup targets and scores on the IRI					
Study 2	64	.03	.08	.04	.03
Study 4	69	.54	.12	.26	.43
Study 5	78	.38	.15	.21	.37
Study 6	65	.17	.14	.17	-.06
M r_z		.37	.13	.19	.32
M r		.35	.13	.19	.31
Combined Z		4.73***	2.05	2.85**	3.30***

Correlations between empathic bias (ingroup – outgroup) and scores on the IRI					
Study 2	64	.03	-.21	.14	-.01
Study 4	69	-.14	-.32	.06	-.09
Study 5	78	.26	.20	-.13	.14
Study 6	65	-.08	.14	-.11	-.02
M r_z		.11	-.03	-.02	.05
M r		.11	-.03	-.02	.05
Combined Z		0.36	-.72	-.21	0.12

Note: *M* r_z = weighted mean correlation (Fisher's *z* transformed). M *r* = weighted mean correlation (converted from r_z to *r*). ***p* <.01, two-tailed. ****p* <.001, two-tailed.

6.5.2 Discussion

The goal of the above analysis was to demonstrate that individual differences would have little or no predictive effects on intergroup empathic bias. I expected that regardless of the participant's gender or how participants scored on measures of trait empathy, having a shared group membership with the target would confer an empathic advantage when responding to their pain. The results demonstrate that over the course of six studies, gender had no significant effects on self-reported empathy overall or when responding specifically to the pain of an ingroup or outgroup target. The effect of gender on ingroup bias, however, approached statistical significance such that female participants were marginally more likely to exhibit an ingroup bias than male participants.

Analysing the effect of trait empathy on behavioural ratings, I observed that scores on three subscales of the IRI had a positive relationship with self-reported ratings of empathy in response to another's pain. Specifically, scoring higher on EC, PD, and FS correlated with higher self-reported ratings of empathy when responding to the pain of an ingroup or outgroup target. Interestingly, the only subscale that did not significantly correlate with behavioural empathy was PT. This is contrary to the idea that 'walking a mile in another's shoes' can promote positive outcomes between individuals (Galinsky et al., 2008). But it is consistent with a recent study showing that adopting another's perspective can result in

negative intergroup consequences when the other is perceived as too different from the self or when doing so elicits unfavourable or upwards comparisons (Sassenrath, Hodges, & Pfattheicher, 2016). In line with my predictions, there was no relationship between scores on any subscale of the IRI and empathic bias. That is, participants' ratings of their own trait empathy had no relationship with their behaviour towards others in an intergroup context.

There are a number of limitations in the scales that are typically used to measure trait empathy, including those used here. First and foremost, responses to these scales are highly susceptible to social desirability. Because empathy is viewed as a positive trait (Schumann, Zaki, & Dweck, 2014) people tend to rate themselves as reliably above average on qualities related to empathy and those related to it, such as generosity (Epley & Dunning, 2000). This positive image of the self confers psychological benefits to the individual (Taylor & Brown, 1988) thus, given the opportunity, individuals will confirm an identity that presents them as highly empathic.

Specifically with regard to the IRI, Jordan, Amir, and Bloom (2016) have discussed how this scale neglects aspects of empathy that refer to the more experience-sharing quality that emerges when observing the suffering of another, as opposed to feelings of compassion or sympathy. Some items of the PD subscale do point to notions of affect sharing, for example, 'When I see someone who badly needs help in an emergency, I go to pieces.' However, the majority of items reflect more an individual's feelings of personal anxiety that arise in response to tense situations rather than in response to other people's anxiety per se, for example, 'In emergency situations, I feel apprehensive and ill-at-ease.' In other scales, such as the Empathy Quotient (Baron-Cohen & Wheelwright, 2004) some items more accurately reflect experience-sharing such as 'seeing people cry doesn't really upset me' but other items in that scale confound this with other processes

involved in social interaction such as ‘I find it hard to know what to do in a social situation’, therefore scores on this scale reflect a variety of interpersonal processes that extend past empathy.

The findings from this meta-analysis show that trait empathy, as it is most commonly assessed in the literature, reliably predicts behavioural responses to another’s pain. For the first time, however, I demonstrate that trait empathy has no predictive value over an individual’s tendency to express more empathy towards an ingroup target, compared to an outgroup target. I also demonstrate that despite the expectation that women are more empathic than men, there was no reliable effect of the participant’s sex on self-reported empathy. These results are consistent with the notion that empathy is not purely determined by our biology or individual differences, but rather depending on situational and motivational factors.

6.6 Conclusion

Research on the role of individual differences in empathy suggest that the more one perceives oneself as empathic, the more one exhibits pro-social behaviours towards others. However, notions from SIT suggest that in an intergroup context, individual goals (such as treating others without prejudice) can interfere with collective goals (such as taking part in intergroup competition). Thus, no matter how someone constructs a personal sense of who they are, they behave towards others according to salient group memberships. With regard to empathy, a shared group membership confers an empathic advantage when responding to another’s pain and suffering, therefore it was expected that there would be no relationship between self-reported ratings of trait empathy and empathic bias in favour of ‘us’ over ‘them.’ In the meta-analysis outlined in this chapter, I provide evidence that participant gender had no predictive effects on behavioural

responding to another's pain, regardless of whether the other was a member of the ingroup or an outgroup. I also presented evidence that while scores on three subscales of the IRI (EC, PD, and FS, but not PT) had a positive relationship with behavioural empathy, scoring highly in trait empathy in no way buffered or negated the tendency to show favour towards members of the salient ingroup over members of an outgroup.

7 General Discussion

The research presented in this thesis has focussed on the importance of intergroup relations when empathising with members of the ingroup and specific outgroups. Converging evidence suggests that empathy is not strictly reserved only for ingroup members and not for outgroup members. Rather, empathy is influenced by our expectations about a person based on their group membership, such as the extent to which we expect them to be warm or competent (Cikara & Fiske, 2011) and the extent to which we believe they are a relevant competitor to us (Chang et al., 2016; Cikara et al., 2014). The impetus for my research is derived from limitations in this literature regarding the intergroup contexts that are typically used. Specifically 1) often this research uses contexts that prime intergroup biases in empathy, such as minimal group paradigms in a context where there are no beliefs about the target group and where empathy is measured in relation to an ingroup and a single outgroup (i.e., 'us' vs. 'them'), not multiple outgroups to which the ingroup might relate differently (i.e., 'us' vs. high-status 'them' and vs. low-status 'them'), and 2) other times, research on this topic focuses on racial group contexts that tap into pre-existing beliefs that are confounded by visually salient cues to categorisation (such as different skin colours and physiognomies). My goal with this thesis was to determine whether or not empathic biases emerge specifically according to beliefs about an outgroup, separate from any cues that might mark difference. At a broader level, I investigated whether and how empathy is influenced by a number of different contextual factors.

7.1 Summary of findings

In Chapter 1, I gave a broad introduction to the topic of this thesis, framed the research within its historical context, and highlighted the empirical perspectives through which I conducted my research.

In Chapter 2, I gave a detailed review of the extant literature and in doing so raised key questions and laid down important arguments for how we interpret the findings on intergroup empathy. These include not only the need to recognise the importance of identity content, but also to account for confounding variables present in studies of intergroup empathy. The aim of the present thesis was to begin rectifying these oversights.

In Chapter 3, I outlined my own approach to answering my research question in light of the identified limitations. In Study 1, I sought to establish a context in which I could measure empathy towards targets from different groups, groups that differed in how they related to the salient ingroup, but in relation to which categorisation is not visually marked. The results demonstrated that there was a bias in favour of the salient ingroup on several measures of group perception important to intergroup relations. Results also showed that some of the outgroups were not perceived to be equal to the ingroup and that the outgroups themselves were not all rated as equal to each other. In Study 2, I investigated whether self-reported empathy for targets in pain would differ according to their ostensible membership in one of the social groups examined in Study 1. With the results of Study 2, I presented initial evidence that intergroup biases in self-reports of empathy were driven by the context specific to a given ingroup-outgroup relation (such as beliefs about a group) rather than simply an ingroup-outgroup distinction. Ratings of empathy were significantly higher towards targets who shared both group categorisations with the salient ingroup (i.e., both a student and from Exeter) relative to targets who differed in one of those dimensions (i.e., a worker from Exeter or a student from elsewhere). At the same time, there was no difference in the degree of empathy given to targets from the ingroup and the outgroup that differed in both dimensions of categorisation (i.e., a worker from elsewhere).

In Chapter 4, I presented evidence from two neuroimaging studies to show that context-specific biases also influence empathy at a (non-controllable) neurological level. Participants exhibited more empathy-related brain activity while observing targets experiencing painful, compared to neutral, events but not when the target was a member of the relatively more competitive outgroup. Participants also exhibited more overall empathy-related brain activation when directly comparing responses to targets from the ingroup or the relatively less competitive outgroup to targets from the relatively more competitive outgroup. That is, empathy biases at the level of brain activation to a target's pain were observed only in relation to one of the two outgroups examined—the outgroup perceived as a rival to the ingroup.

The two studies presented in Chapter 5 investigated whether empathic bias is influenced by another type of threat (i.e., fear that is incidental to an intergroup context). These studies tested the hypothesis that fear would exacerbate empathic bias specifically in the direction of outgroup hate. That is, using a minimal group paradigm, I expected that, at baseline, participants would report more empathy towards members of the salient ingroup than towards members of the outgroup, replicating prior research. However, I expected this distance to increase when participants were induced to feel fear, compared to when they were not induced to feel fear. It was unclear whether fear would lead to increased empathy towards the ingroup or decreased empathy towards the outgroup. Results revealed that participants reported an increase in outgroup distancing and decrease in empathy for the outgroup's pain, following inductions to feel fear. Empathy for targets from the ingroup was unaffected by the fear manipulation.

Finally in Chapter 6, I presented meta-analyses of the role of individual differences in intergroup empathy. I provided evidence that neither the participant's gender nor their scores on a widely used and reliable measure of trait empathy had any relationship with

empathic bias, despite the latter's direct relationship to absolute levels of empathy. This suggested that—consistent with principles from Social Identity Theory—in an intergroup context sharing a group membership with a target conferred an empathic advantage when responding to their pain (i.e., participants reliably reported more empathy for targets from the ingroup than any outgroup). This occurred regardless of one's gender or chronic tendency to empathise with others.

7.2 Contributions of the Present Thesis

When considering the contributions of the present thesis, it is clear that the results are not shocking; they confirm what you might expect. First, and very broadly speaking, these results support the idea that empathy is context dependent. Consistent with previous accounts, my research supports the notion that empathy fluctuates according to a number of factors, including our emotions and motivations (Zaki, 2014). Second, and more specifically, this thesis demonstrates that empathy within an intergroup context is more nuanced than simply being attenuated to outgroup targets. Indeed, when we feel less empathy for 'them' it's not simply because 'they' are not one of 'us' but because 'they' represent something specific to me and to 'us'.

These findings speak to one of the issues that originally motivated this research. Reports suggest that healthcare inequality is a growing crisis; that certain groups in society receive a far poorer quality of healthcare than others (Hayward et al., 2000). For example minority status groups receive less pain relief treatment than others in emergency room settings (Pletcher et al., 2008). What particularly interested me about this issue was that the neglect in treatment to minority groups did not seem to be driven by a lack of empathic concern from their physicians. Rather it seemed to result from the physician's inability to assess their patient's pain accurately. Delving deeper into this literature revealed that this

inability stemmed from false beliefs that physicians had about those groups like that Black people experience pain less than White people (Hoffman et al., 2016).

In my research I have found that, indeed, how we respond to another's physical pain is related to the beliefs we have about the target's group. Interestingly, however, empathic responses appeared to be differentially influenced depending on whether they were more directed towards the other or the self. In measurements of empathic concern (an other-focussed response) participants exhibited a bias against a threatening outgroup target (while leaving empathy towards the ingroup and a non-threatening outgroup relatively intact). In this, both self-reports and the underlying physiology were congruent. On the other hand, when asking participants how painful the event seemed to them (a more self-focussed response) no bias emerged; everyone appeared to feel the other's pain to the same extent. It was only when analysing the underlying physiology that bias was revealed. This suggests that participants were reasonably aware of their biases in empathic concern but perhaps were not so aware when it came to accurately assessing how much pain the threatening outgroup was in.

These findings make an important contribution in our understanding of how inequalities in healthcare persist. According to a recent systematic review, healthcare providers appear to have moderate to good accuracy in assessing other's pain (Ruben, van Osch, & Blanch-Hartigan, 2015) but this heavily relies on a patient's self-report or, where verbal reports are not possible, from assessing nonverbal cues like facial grimacing (Fink, 2000). What this thesis reveals is that the greater social distance there is between the observer and the target, the less accurate pain assessment is. Moving forwards, I would like this thesis to stand at the very least as a reminder that biases in pain perception exist and these very likely contribute to the growing disparities in healthcare quality—there is nothing ground-

breaking in that statement but continuing to highlight this literature is a step towards addressing the problem.

I will however go one step further than simply reminding the reader of the existence of bias, I offer one possible strategy to tackling it. Whatever the underlying motivations, participants' explicit assessment of others' pain significantly departs from their implicit understanding of it. It suggests that to get an accurate understanding of another's pain we cannot merely rely upon our own perception. Some researchers have had success in improving pain assessment by triangulating self-reports with brain imaging technology (Robinson et al., 2013). Using MRI to scan every possible patient is a daunting and impractical solution; the methodology is time-consuming and expensive but electroencephalography (EEG), a far cheaper alternative to MRI, could certainly be (and indeed has been) used to more objectively assess an individual's experience of pain (Brown, Chatterjee, Younger, & Mackey, 2011).

This thesis has also contributed to a firmer, richer understanding of empathy, demonstrating that empathy is not necessary biased to the extent that it is 'switched on or off' to someone's pain—No, the reality is more pernicious. Across six studies, I found that participants reliably exhibited empathic bias, but only ever as a relative difference between responses to 'our' vs. 'their' pain. Ratings of empathy were always above the midpoint of a scale and never appeared to reflect what researchers have previously reported to be malicious pleasure or Schadenfreude when observing an outgroup target's pain (Cikara, Botvinick, et al., 2011; Leach et al., 2003). This could be for a number of reasons. Perhaps this emerged because the participants in my studies shared some level of categorisation with the targets (they were all students within the southwest of the UK). Perhaps because even when competition was made salient it was somewhat indirect, through upwards comparisons of

status, rather than a competition with a conceivable victory or defeat. It is also possible that this was because the observed events were clearly and intensely negative—there is very little ambiguity to seeing someone being stabbed. I expect the likelihood of Schadenfreude emerging would increase if the events I presented did not seem to involve lasting damage or bodily harm to the target, but instead constituted only mild discomfort or misfortune. That is not to say that participants definitely did not feel some sense of joy at the other's pain, only that they did not report it. Indeed, the results of the neuroimaging studies demonstrated that empathic bias manifested far more prominently when removing the filter of response control.

At the self-report level, I observed only small biases in favour of the ingroup compared to any of the outgroups. But at the level of neural activation it was clear that this was not the full picture. First, the degree of empathic bias was far larger than in the self-reported data and, second, empathic biases emerged more in line with participants' perceptions of the target groups. This could be for a few different reasons: Because empathy is socially desirable (Decety & Jackson, 2006), because blatant group-based prejudices are socially *un*desirable (Rattazzi & Volpato, 2003), or maybe because empathic bias operates outside of conscious awareness. Whatever the case, the nature of these effects is important given how subtle forms of interpersonal discrimination have been documented to be as, if not more, damaging than overt discrimination (Barreto & Ellemers, 2015; K. P. Jones, Peddie, Gilrane, King, & Gray, 2016)—influencing a variety of downstream processes such as employment opportunities (Rowe, 1990) and provision of healthcare (Malat, 2001). Therefore, one of the important contributions this work is revealing that empathic bias is not always a blatant reduction in empathy; it can be subtle, such that its influence on decision making can go unnoticed and unchecked.

A further contribution of this work is how it highlights the importance of specific relations between groups and how the content of an identity can drive intergroup biases. Prior research has shown that individuals exhibit less empathy towards lower status groups following denials to humanity (Fiske, 2009). In my research, I found that participants felt as much empathy for members of the lower status group as they did for members of their ingroup. But, it is important to consider that the lower status groups in my studies were rated as warm and sociable, not cold like the dehumanised groups used in previous research (e.g., Cikara & Fiske, 2011). Likewise, the group was only rated as *relatively* lower in status, not low in absolute terms. This highlights one of the important distinctions that I have tried to make through this thesis: That we need to avoid being overly general about key concepts and pay attention to the importance of content and the specificity of intergroup relations.

Broadly, this research highlights possible routes to prejudice reduction and intergroup harmony. Participants in my studies showed equal favour to the targets from a relatively disadvantaged group and their ingroup. One could interpret this finding to as outwardly selfish and strategic. Showing concern for a disadvantaged group reconciles with us showing less empathy elsewhere; towards another more advantaged group. This allows us to confirm a positive and empathic personal identity while still being a good group member and derogating against our group's competitors. This behaviour might also have a status-management component to it. Feeling concern or sympathy for the disadvantaged group may be an indicator of paternalistic helping as it maintains existing forms of social relations, highlighting that they need our help and we are in a position to give it (Nadler, Harpaz-Gorodeisky, & Ben-David, 2009). However, helping the disadvantaged outgroup also draws attention away from group inequality (the so-called "irony of harmony") reducing the likelihood for social change to occur (Saguy, Tausch, Dovidio, & Pratto, 2009). While this may be driven by self-serving motives, positive contact improves attitudes and blurs the

boundaries between groups. It may undermine collective action but this commonality promotes understanding and brings members of advantaged and disadvantaged groups together (Saguy, Dovidio, Pratto, 2008). From a methodological perspective, the disparity I observed between self-reported and neural responses is, in itself, also an important contribution to the literature. In Chapter 4, I reported an item-wise analysis demonstrating that the language of the self-report item was associated with the activation of discrete neural networks. Specifically, brain regions associated with experience-sharing (dACC and AI) were significantly more active while participants responded to self-focussed items (feeling *with* the other's pain) during the response phase, while those associated with understanding other's mental states (i.e., mentalising; mPFC) were significantly more active when answering other-focussed items (feeling *for* the other's pain). This finding is consistent with previous work demonstrating that different facets of empathy rely upon distinct neural architecture in the brain (Kanske, Böckler, Trautwein, Lesemann, & Singer, 2016a; Lamm et al., 2011; Ochsner et al., 2008; Zaki, Ochsner, Hanelin, Wager, & Mackey, 2007), but it is also crucial for researchers who use self-report measures—it demonstrates that how we construct self-report items can be critical for engaging the processes we seek to measure with it.

The results of this thesis also contribute to a more fine grained understanding of the role that threat plays during intergroup bias. Threat arises from a broad set of triggers, but it may not always operate or affect bias in the same way. Threat from competition, for example, may dampen empathy because we actively avoid feeling bad for those we're competing against. Fear, on the other hand, appears to have the same effect on empathy but may instead be as a result of drawing to the ingroup and dissociating away from the outgroup. Looking at fear in isolation of competition allowed me to clarify that in reality the findings suggest very similar patterns for both types of threat: Competition inherent to the intergroup context and fear that is incidental to it had similar effects on empathy.

An avenue for future research would be to investigate whether other types of threat, such as challenges to one's status position, worldview, or self-impression, also influence empathy and bias in the same manner.

7.3 Limitations and Directions for Future Research

The results of the studies outlined in Chapters 3, 4, and 5 offer new insights into when and why people empathise with another's pain. However, there are also limitations in these studies that need to be addressed and that may provide directions for future research.

My findings differ from those of previous research in the role that mentalising plays during interactions with competitive others. Previous research identified that the medial prefrontal cortices were selectively associated with monitoring other's actions in a competitive context (Decety, Jackson, Sommerville, Chaminade, & Meltzoff, 2004). I found, however, that the prefrontal cortex was more associated with monitoring members of the ingroup and relatively less competitive outgroup. The reason for this, I would suggest, lies in the specifics of the context. In the study by Decety and colleagues, the participant and target were playing a game with one another where the target could support or block the participant's moves, thus making it necessary to try and predict the other's intentions. In my study, however, the target had no capacity to do anything to the participant—events happened to the target and the participant merely observed. Therefore there was no need to try and 'get inside the other's head'. In fact, it seems more likely one would actively avoid thinking about the competitive target's experiences in this case—thinking about their pain risks feeling empathy for them and this would be incongruent with our motivation to compete. This would point to a key difference between *wanting* to empathise with another and *needing* to empathise with another—people may be unmotivated to do so, by default, when the target belongs to a rival group, but this motivation might kick at times when doing so can provide

the ingroup with competitive advantage. Some of these conclusions are drawn in the absence of direct empirical evidence, but with an eye toward guiding future research to resolve inconsistencies in the role of mentalizing during intergroup competition.

A criticism of the neuroimaging studies is the reliance of some of the effects on traditional univariate analyses, in particular, the use of subtractive methodology. This methodology involves identifying the contributions of a particular brain region in a specific task (i.e., responding to another's pain) on the basis of enhanced hemodynamic signals during trials of interest (i.e., involving a painful event) as compared to control trials (i.e., involving a neutral event). This approach has several limitations; It assumes that each cognitive process relies upon a single brain region, it ignores the interconnected nature of the brain and the fact that a given area can participate in a variety of different processes. A specific concern for this thesis is that some of the regions that I reported on (the anterior insula and the dorsal anterior cingulate cortex) play an important role in empathy, but also in a wider range of psychological functions including executive processing, working memory, inhibitory control, conflict monitoring, emotion, consciousness, and salience detection (Lieberman & Eisenberger, 2015). Therefore, it is important to be open to alternative explanations concerning the involvement of those pain-related brain regions during empathic experience. It could be said that the results of the neuroimaging studies would be more compelling given a report on the statistical relationships between the ratings of group-based perceptions and the neural indices of empathy—including also the process through which one influences the other via path analyses. The reason against doing this was that the size of the samples in these studies precluded any reasonable inferences that could be made from such an analysis (see Yarkoni, 2009). However, future research might focus on gathering larger sample sizes with the specific focus of examining these interconnections.

With regards to the studies reported in Chapter 5, it is important to consider the specificity of the findings to fear. In my investigation, I included checks of the success of the fear manipulation, including measures on fear but also anxiety and nervousness. With these, I found that participants reported feeling more fear, following inductions to fear, than other negatively-related emotions. However, the difference is only a matter of degree—participants reported feeling almost as anxious as they did afraid. While anxiety and fear are very much wedded, it will be important for future research to try and control for other negative-emotions such as anxiety (it is unlikely that one could elicit fear without anxiety, but one might elicit anxiety without fear) when determining the role of fear in intergroup relations.

One might suggest that the task outlined in Chapter 5 closely resembles that of a mortality salience manipulation and that the effects do not contribute anything unique to the literature. I would argue, first of all, that the task does not trigger any sense of existential threat. Of course, an image of a rabid dog or a shark is scary because it refers to a survival type emergency; however, first, these are quite clearly only images on a screen and, second, were not designed to trigger reminders of one's mortality—the stimuli depicted things that would harm or hurt more so than kill. The images also appear so rapidly and for so short a time that they act more as a brief aversive stimulus—as a 'virtual shock'. One potentially interesting avenue of future research would be to examine whether fear-enhanced biases influence not only empathic responses but also harm-related behaviours towards others, for example, in the likelihood of shooting others in the police officer's dilemma (Mekawi et al., 2015). Additionally, future researchers might investigate whether fear-enhanced biases encourage derogation against all outgroups or only against those that have fear-related stereotypes, such as the stereotype of Muslims as terrorists.

Finally, in Chapter 6, I provide an analysis of the role of individual differences in intergroup empathy. This was a secondary analysis of studies that were not primarily focussed on assessing individual differences, therefore the conclusions that can be drawn are limited to only identifying associations among variables. Researchers in the field of empathy seem keen to consider the role of individual differences—almost always including some measure of trait empathy alongside their main dependent variables—therefore, future researchers would do well to conduct a wider scale investigation with this as a specific focus.

My thesis highlights the many ways in which empathy is attenuated to others; on the basis of their group memberships, how we perceive those groups, and by our own expressions of fear. But to end on a more positive note, these findings highlight just how malleable empathy is and how easily we might encourage others to feel empathy and to foster intergroup harmony. We might consider the automatic nature of pain perception to be stable and unchangeable but as I have shown here, and as researchers have shown previously, one's empathy changes following even very subtle cues. Schumann and colleagues (2014), for example, found that inducing a malleable theory of empathy improved a participant's willingness to listen to an outgroup target's story and even engage in empathy when it was expected to be painful. Getting participants to meditate on a regular basis can also foster compassion for another's distress, increasing psychological (Jazaieri et al., 2015), behavioural (Condon, Desbordes, Miller, & DeSteno, 2013), and physiological (Klimecki, Leiberg, Lamm, & Singer, 2013) responses. Likewise, altering the social value of empathy (e.g., by convincing participant's that it is attractive to the opposite sex) not only makes participants more sympathetic to others' plight but it actually makes them better at recognising another's emotions using only limited information (Thomas & Maio, 2008).

My research does not serve as direct evidence that empathy can be improved nor do I lay out advice as to how to go about improving it. But my research provides further clout to the notion that empathy in response to another's pain is a product of our motivations, even when pain is physical and our response appears to be automatic. It is within our power to improve empathy by altering our motives. Changing our representation of the self to be more inclusive, refocusing our perception of other groups, and interpreting situations in a different light substantially changes how we understand, share, and care about each other's lives.

7.4 Conclusion

My goal with this thesis has been to underline the need to think about intergroup contexts in more specific terms rather than simply as 'us' vs 'them'. In particular, this thesis has helped to expand on previous research by elucidating some of the ways in which empathy can be reduced to others for different reasons. The contribution of this thesis is therefore best summarised by recognising the importance of meaning in the relations between groups because it is in that meaning that the specific aspects of intergroup existence is lived out.

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Appendices

Appendix A: Full Account of the Self-Report Group Perception Measures Used in Studies 1, 3, 4, 5 and 6

Not at all 1 2 3 4 5 6 7 Very much

- To what extent do you think that students of University of Exeter are generally perceived as competent within British society?
- To what extent do you think that students of University of Exeter are generally perceived as capable within British society?
- To what extent do you think that students of University of Exeter are generally perceived as intelligent within British society?
- To what extent do you think that students of University of Exeter are generally perceived as friendly within British society?
- To what extent do you think that students of University of Exeter are generally perceived as warm within British society?
- To what extent do you think that students of University of Exeter are generally perceived as trustworthy within British society?
- To what extent do you think that the students of University of Exeter are competitive when applying for prestigious jobs?
- To what extent do you think that the status of students at University of Exeter is high compared to students at other universities?
- To what extent do you think that Exeter is a prestigious university?
- To what extent do you think that the status of University of Exeter is high within the UK?

- To what extent do you think students of <Outgroup University> University are similar to students of Exeter?
- To what extent do you think students of <Outgroup University> are comparable to students of Exeter?
- To what extent do you see <Outgroup University> students as rivals of Exeter students?
- To what extent do you see students of <Outgroup University> as competitors in the job market?
- To what extent do you believe you would have trouble getting a job for which a student of the <Outgroup University> would also have applied?

Appendix B: Materials Used in Studies 3 and 4

Participant Information Sheet

Study title

Understanding emotions in others

Invitation to take part

We seek participants for a study that will take approximately 1 hour. Before you decide whether or not to participate, it is important for you to understand what participation will involve. Please take time to read the following information carefully. Please feel free to ask us if there is anything that is unclear or if you would like more information.

What is the purpose of the research?

This research will examine the perceptions of social situations to better understand the conditions favouring optimal human performance in tasks involving social interaction.

Who is doing this research?

The researcher is Matthew Richins, MSc, a PhD candidate at the University of Exeter, supervised by Professor Manuela Barreto, Dr. Anke Karl, and Dr. Natalia Lawrence from the School of Psychology, University of Exeter.

Why have I been invited to take part?

We are looking for healthy participants without known psychological or medical impairments (including heart problems, brain tumours, hypertension, and health issues resulting in an incompatibility with MRI scanning), and that have not taken illicit drugs within 48 hours of the study, to complete a task on emotional processing.

Do I have to take part?

Participation is completely voluntary. Even if you agree to participate, you have the right to terminate participation at any moment, and for any reason, without the need to disclose your reasons and without penalty.

What will I be asked to do?

The study is a computer-based task where you will be asked to observe photographs, some that will depict people who are experiencing unambiguously negative events e.g., touching broken glass. These images will not be highly graphic or considered to cause more distress than you might see during a news report or TV drama shown after the 9 p.m. watershed. You will also be

asked to make judgments about the individuals portrayed in those photos. Once it has been determined that it is safe for you to take part, you will be asked to observe these photos whilst lying down in the fMRI scanner, as seen in the picture below. During the scan you will be given a pair of headphones to wear for your safety.

During this time an initial localizer scan will be taken, requiring you to lay still and relax for 5-10 minutes. A functional scan will then begin where you will be required to respond to the task presented to you as part of the main study; this will last for approximately 40 minutes in total (totalling 50 minutes in the scanner). Once the task is complete, the scanner will power down and you will be removed within 1 minute. Finally you will be debriefed on the details of the study and asked to sign a receipt for the appropriate payment, which you will then be given.

What is the device or procedure that is being tested?

Brain activity imaging

What are the benefits of taking part?

There are no direct benefits from participating in this research, but your data will contribute to a greater understanding of tasks involving social interaction

What are the possible disadvantages and risks of taking part?

There are no direct risks to the participant; there may be some anxiety related to the noise or small space of the MRI scanner. This will be minimized by giving you short breaks. You will also be given an alarm button which you can use to alert the experimenters should you experience any discomfort. The researchers will adhere to strict safety protocols designed to protect your wellbeing at all times.

Can I withdraw from the research and what will happen if I don't want to carry on?

As a participant you have the right to withdraw yourself or your dataset at any time and for any reason during the experiment, with no need to disclose the reasons for withdrawal and without penalty.

Are there any expenses and payments which I will get?

You will receive £10 pounds as a token of appreciation. If you are a first year Psychology student at the University of Exeter, you can instead choose to receive 1 credit for your participation. You will incur no expenses.

Whom do I contact if I have any questions or a complaint?

Queries about the study should be directed to the researcher and supervisors of the project (see below for contact details) and complaints should be communicated to Dr. Cris Burgess, Chair of the Psychology Ethics Committee, University of Exeter. C.N.W.Burgess@exeter.ac.uk +44 (0) 1392 724627

What happens if I suffer any harm?

No harm is envisaged during this study. However, if you feel unwell you should immediately alert the experimenter, who will offer you first aid assistance and arrange for further assistance, if needed.

Is it possible that you will find something unexpected on my brain scan?

The scans obtained in this study are NOT diagnostic scans. The researchers are NOT medical professionals, and are not able to recognise or diagnose any form of medical disease or disorder as a result of physical brain defects. Researchers will therefore not check your scans for abnormalities.

What will happen to any data I give?

No samples will be collected. Responses to questions and brain imaging data will be stored and analysed on a lab computer. All data will only be analysed in aggregate form, which means that there will be no individual findings. If you wish to receive information about the results of this study, please contact us (see below).

Will my records be kept confidential?

All data will be kept anonymous. No identifying information will be kept. Only those immediately on the project research team will have access to the data, but they will not be able to identify the source of each individual response.

Who is organising and funding the research?

This research is organized by the School of Psychology, University of Exeter and funded by the Defence, Science, and Technology Laboratory, part of the Ministry of Defence.

Who has reviewed the study?

This study has been reviewed and approved by the Ministry of Defence Research Ethics Committee (MoDREC). The detailed materials of each individual study have also been reviewed by the Psychology Ethics Committee, University of Exeter.

Further information and contact details.

If you would like to request any additional information, please feel free to contact the primary researcher responsible for this project, Prof. Manuela Barreto, by emailing m.barreto@exeter.ac.uk or telephoning 01392-722674.

Compliance with the Declaration of Helsinki.

This research is in full compliance with the ethical principles documented in the declaration of Helsinki Sixth Revision, Korea, 2008.

Magnetic resonance imaging screening form 1

NAME OF PARTICIPANT..... Sex: M / F
Date of birth…… Weight in kg…..……(or Stones/lbs) Height in cm or m……...……
Please read the questions on the screening form CAREFULLY. Your safety in the magnetic environment is our primary concern. THIS IS VERY IMPORTANT. For a very small number of individuals, being scanned can be uncomfortable, or endanger health or even life. The purpose of these questions is to make sure that you are not such a person. The information you provide will be treated as strictly confidential and will be held in secure conditions. If you are unsure of the answer to any of the questions, please ASK the person who gave you this form or the person who will be performing the scan. You may also choose to not answer any of the following; however it would not be safe for you to participate and thus cannot participate in the study. Definitions of some of the more technical terms are given overleaf.

Please answer all questions	*Circle answer*
1. Have you been fitted with a pacemaker, artificial heart valve, cochlear implant or any other implanted device?	YES/NO
2. Have you any surgical clips, aneurysm clips, shunts or stents in your body?	YES/NO
4. Have you ever had any metal fragments in your eyes?	YES/NO
3. Have you been exposed in your life to metal debris as a result of welding, grinding, filing, sawing or drilling of metal either occupationally or recreationally?	YES/NO
5. Do you wear a hearing aid?	YES/NO
6. Have you ever had any metal fragments, e.g. shrapnel in any other part of your body?	YES/NO
7. Have you any surgically implanted metal in any part of your body (e.g. joint replacement or bone reconstruction).	YES/NO
8. Have you ever had any surgery that might have involved metal implants of which you are not aware?	YES/NO
9. Is there any possibility that you might be pregnant?	YES/NO
10. Do you have a contraceptive coil (IUD) installed?	YES/NO
11. Have you been sterilised using clips?	YES/NO
12. Do you have **any** dental work (including dentures, crowns, bridgework, braces) in your mouth, other than simple fillings?	YES/NO
13. Have you ever suffered from any of: epilepsy, diabetes or thermoregulatory problems?	YES/NO
14. Have you ever suffered from any heart disease?	YES/NO
15. Do you have any Tattoos? Do you have any permanent eye makeup?	YES/NO
16. Are you wearing any skin patches? (eg. Nicotine)	YES/NO

I have read and understood the questions above and have answered them correctly.

SIGNED…… DATE……

In the presence of …….. (Name) ……..

Definition of Technical Terms

PACEMAKER: An electronic device that is surgically placed in the patient's body and connected to the heart to regulate the heartbeat. ***The safe operation of a pacemaker can be temporarily or permanently disrupted if a person with a pacemaker goes near an MRI scanner***.

COCHLEAR IMPLANT: An electronic medical device that bypasses damaged structures in the inner ear and directly stimulates the auditory nerve, allowing some deaf individuals to learn to hear and interpret sounds and speech.

ANEURYSM CLIP: A surgically implanted metal clip used to cut off blood flow through the neck of an aneurysm. An aneurysm is a deformity of a blood vessel in the body, which can swell and burst causing a haemorrhage.

SHUNT: A surgically implanted connector, which allows passage of fluid between two parts of the body. A common use of a shunt is to allow fluid to drain away from the brain, thus reducing pressure in the brain. May also describe a tube which allows blood to be moved from one part of the body to another.

STENT: A surgical implanted device that is inserted into a blood vessel to provide support, keep the vessel open and promote unblocked and enhanced blood flow. Sometimes used in other fluid carrying vessels in the body such as bile ducts etc.

THERMOREGULATORY PROBLEMS: Thermoregulation is the body’s in-built ability to keep all parts of your body at their correct temperature. Some illnesses prevent the person from properly controlling the temperature of their body. If you think you may have such an illness, please answer “YES” and discuss it with the person who gave you the form, or the person who is in charge of the scan.

Informed Consent Form

NAME/CODE OF PARTICIPANT …… Sex: M / F Date of Birth:……

If you have any questions, please ask the person who gave you this form. You are under no pressure to give your consent and you are free to withdraw from the MRI examination at any time. **You may also choose to not answer any of the following; however by doing so it would not be safe for you to participate and thus your participation in the study will end.** By signing the form you are agreeing to the following:

- I understand that I am to take part in a functional MRI experiment in which I will be placed in the scanning machine for up to 1 hour, while my brain activity will be measured by the machine. During the scan I will be shown visual images, such as faces, and will be asked to make simple judgments about them. I will make these responses using a button-box. ☐
- I confirm that I have read and understand the fMRI Participant Information Sheet and have had the opportunity to ask questions about it. ☐
- I understand that participation in this study is entirely voluntary and that I can withdraw from the study at any time without giving a reason. ☐
- I understand that I am free to ask any questions at any time and that I am free to withdraw or discuss my concerns with the lead researchers (Matt Richins, Prof. Manuela Barreto, Dr. Natalia Lawrence, or Dr Anke Karl). ☐
- I understand that I can talk to the operators via an intercom and that I will be given an alarm that I can use at any time to end the scan and signal to the operator. ☐
- I understand that I can request, for any reason and at any time that I be immediately removed from the MRI machine. ☐
- I understand and agree that the MRI scan is not a medical screening procedure and that the researchers are not qualified to provide a clinical diagnosis or identify potential abnormalities. For these reasons the scans will not be checked for abnormalities and therefore there will be no report of incidental findings. ☐
- I have completed the initial screening form and have been told that it is safe for me to be scanned. ☐
- I understand that the information provided by me will be held anonymously, such that my data cannot be traced back to me individually. The information will be retained for up to 100 years when it will be deleted / destroyed. I understand that I can have access to the information at any time. ☐

I, _____**(NAME)** consent to participate in the study conducted by The School of Psychology, University of Exeter.

Signed: ……..... Date: ……...

Do not write beneath this line, For Staff Use Only

UNIQUE IDENTIFIER:……

Statement by the Researcher carrying out the scan:

I certify that the above participant signed this form in my presence. I am satisfied that the participant fully understands the statement made and I certify that he/she had adequate opportunity to ask questions about the procedure before signing.

Magnetic resonance imaging screening form 2

This form should be completed and signed immediately before your scan, after removal of any jewellery or other metal objects and (if required by the operator) changing your clothes.

NAME OF PARTICIPANT ……
Date of birth……. Sex: M / F

Please read the following questions CAREFULLY and provide answers. For a very small number of individuals, being scanned can endanger comfort, health or even life. The purpose of these questions is to make sure that you are not such a person.

You have the right to withdraw from the screening and subsequent scanning if you find the questions unacceptably intrusive. The information you provide will be treated as strictly confidential and will be held in secure conditions.

BEFORE YOU ARE TAKEN THROUGH FOR YOUR SCAN IT IS ESSENTIAL THAT YOU REMOVE ALL METAL OBJECTS INCLUDING: WATCHES, PENS, LOOSE CHANGE, KEYS, HAIR CLIPS, ALL JEWELLERY, BRASSIERES WITH METAL FASTNERS, METALLIC COSMETICS, CHEQUE/CASH POINT CARDS.

Please answer all questions	*Circle your answer*
1. Are you wearing or carrying any metal items such as those listed above?	YES/NO
2. Have your answers to any of the questions in the initial screening form changed? (The initial screening form must be shown to you before you answer this question.)	YES/NO
3. Have you been fitted with a pacemaker, artificial heart valve, cochlear implant or any other implanted device?	YES/NO
4. Is there any possibility that you might be pregnant?	YES/NO
5. Are you currently feeling unwell (colds, flu etc.) or have you been unwell in the last week?	YES/NO
6. Have you taken any illicit drugs within the past 48 hours?	YES/NO

(we require the following information in the event that we observe structural features in your brain scan that we would not expect to routinely find – we are not trained medical professionals and so ask your permission that we might contact your GP should this situation occur) **Note: we will not inform you of any abnormalities, nor in the event that we contact your GP.**

Name of General Practitioner: ……

Surgery Name/Address: ……

I have read and understood the questions above and have answered them correctly.

SIGNATURE…… **DATE**……

FOR STAFF USE:
I have taken adequate steps to ensure that the volunteer has no ferro-magnetic metal in or on his/her person and I am satisfied that the scan can proceed.

SIGNATURE…… **NAME (print)** ……..

Debrief form

Understanding how social identities shape empathy and failures to empathize: A social neuroscience approach

Individuals' abilities to empathise with others are compromised by a variety of factors. One important factor that has been shown to decrease the extent to which empathy is experienced is the group membership of those who perceive (i.e., perceivers) and those being perceived (i.e., targets). Indeed, prior research has shown that when perceivers and targets belong to different social groups (or have different social identities), perceivers experience less empathy than when they belong to the same social group (or share a social identity)—a phenomenon we label 'empathic bias'

The aim of this PhD research is thus to understand the socio-neurological mechanisms underlying empathic experience. We aim to improve our understanding of empathy. The individuals you observed during the task were randomly allocated to a either student or admin position within a University and the University affiliation was also randomised.

We expect to demonstrate that your responses will be affected by the social membership of the target i.e., whether the target is someone you consider part of your social group (ingroup) or someone that is not (outgroup). We expect your responses will display less empathy in the face of a negative event when the target is an outgroup (vs. ingroup) member.

We remind participants that all data is kept strictly confidential and you have the right to see and withdraw your data at any time. If you wish to know the outcome of the study, or have any further questions or comments please contact:

Matthew Richins: m.richins@exeter.ac.uk or 07473860651

Prof. Manuela Barreto: m.barreto@exeter.ac.uk or 01392-722674.

Any complaints should be communicated to Dr. Cris Burgess, Chair of the Psychology Ethics Committee, University of Exeter. C.N.W.Burgess@exeter.ac.uk +44 (0) 1392 724627

We greatly appreciate your participation.

One version of the bogus news article from Study 4, Chapter 4 (the alternative simply switches Cardiff with Sussex)

TUESDAY, SEPTEMBER 8, 2015 SIGN IN / JOIN ABOUT EDITORIAL TEAM BECOME A MEMBER

EXEPOSÉ

NEWS COMMENT FEATURES LIFESTYLE MUSIC SCREEN ARTS & LIT GAMES
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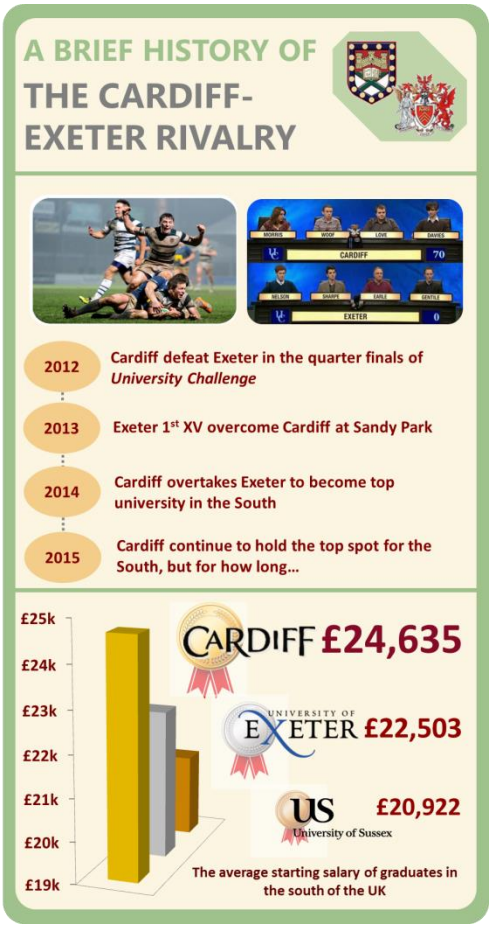
COMMENT EDITORS' PICKS FEATURES NATIONAL

University in world top 100 but still not the best in the South.

163 SHARE Facebook Twitter

*By **Comment** – September 09, 2015*

The **University of Exeter** is now ranked 93rd in the *Times Higher Education World University Rankings*, placing it among the very best institutions across the globe. The new ranking marks a significant rise for the University, having leapt from 154th last year. With this, Exeter may yet reclaim pole position as the top university in the South of the UK—for that, however, we still need to overtake our longstanding rival university, Cardiff. There are currently 3 top universities in the South: Exeter, Cardiff, and Sussex, all of which are well-known for a high level of graduate training and academic prowess. It is **Cardiff University**, however, that we consistently meet in both academic and sporting conflicts: Over the past years Exeter have met Cardiff on the battlefield matching victory with defeat, leaving no clear overall victor. Both universities are members of the prestigious Russell Group and, as such, offer their graduates the best opportunities for employment. Recent records indicate that graduates of Cardiff, however, are currently far more likely to be employed within 6 months of graduating and earn a salary that is, on average, **£4k more than graduates from Exeter or Sussex**. As we rise in the world's rankings, perhaps our latest graduates can begin to close the gap, but there's work to do. Professor Sir Steve Smith, Vice-Chancellor of the University of Exeter, had this to say:



Employability in the south is stronger than ever for graduates of Cardiff University Infographic: HESA

"Please don't think that our job is done. Our goal is long term sustainable achievement. Let's make our next goal to be the best in the South"

With this new accolade, we ask the students of Exeter: Can we beat Cardiff and reclaim our crown?

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Peter Lawrence @pistollaw 29 Sep
I think exeter and cardiff keeping swapping 1st and 2nd place. Hopefully this year we'll be 1st again...
Retweeted by Exeposé

Andrew Hanson @drewHanson 29 Sep
We should be number 1 in the south.
Retweeted by Exeposé

Jonathan Corry @collapsiblefox 28 Sep
At least we have a nicer campus than them x) #exeterftw
Retweeted by Exeposé

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Appendix C: Description of Stimuli Used in Studies 5 and 6 from the Set of Fear Inducing Pictures database (SFIP; Michałowski et al., 2016)

- [Animals_004_v] A dog snarling towards the camera
- [Animals_069_h] A large spider set to pounce towards the camera
- [Animals_035_h] A snake slithering towards the camera
- [Objects_148_h] A gun pointing towards the camera