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The Social Psychology of Spatiality and Crowding

**Thesis submitted by David Lee Novelli to the University of
Sussex for the qualification of Doctor of Philosophy in
Psychology, August 2010**

I hereby declare that this thesis has not been and will not be,
submitted in whole or in part to another University for the award of
any other degree.

Signature:.....

Acknowledgements

I have many people to thank for the contributions that they have made to this thesis, both directly and indirectly. First, I would like to offer my thanks to John Drury – my supervisor since the final year of my undergraduate studies, through my Master's and for the duration of my D.Phil. John inspired me to undertake this research project, and his support, encouragement and advice throughout, have been invaluable.

I would also like to extend my thanks to Steve Reicher at the University of St Andrews. Without Steve's vision, this project may never have come to light. Also at St. Andrews, thanks to Fergus Neville who has enthusiastically shared research and football-related anecdotes with me over the past few years. Thanks also to those who helped me to collect data – Stephen Hamilton, Tina Kretschmer, and Alisdair Taylor for their help with my field study, and Joe Barnett for playing my confederate. Thanks for your patience!

There are also many people away from academia who I would like to thank. Ana and Hugh, thanks for putting up with me at your kitchen table for the past year – I can't have been a pretty sight first thing in the morning! Mum and dad, thank you so much for your love and support throughout – I couldn't have done it without you. And lastly, to Laura – thank you so much for your love, patience, support and understanding over the past few years – I know it hasn't been easy at times. And thank you for giving me the most brilliant distraction from my thesis write-up nine months ago – our lovely sons, Max and Joe.

University of Sussex
Doctor of Philosophy in Psychology
The Social Psychology of Spatiality and Crowding
Summary

This thesis applies self-categorization theory (SCT) to the behavioural and experiential dimensions of spatiality and crowding. A literature review in Chapter 2 will highlight the study of 'personal space' as a dominant theoretical approach to understanding variable crowding experiences. Several problems with the conceptualisation of 'personal space' will be discussed and in Chapter 3, SCT will be introduced as a theoretical framework, which can explain spatiality and crowding in terms of identity and group-level processes.

Chapter 4 investigates the impact of group relations on spatiality. In study 1, participants in minimal groups sought closer proximity to an in-group member than to an out-group member. Study 2 used national categories as the basis for identification. Although non-significant, the findings mirrored those of study 1. Additionally, the relationship between perceived difference and physical distance was moderated by the group context of the interaction. Chapter 5 investigates the impact of group context and interaction distance on participants' subjective experience. The hypothesised effect of these two independent variables on participants' experience was not supported. However, participants in studies 3 and 4 expressed a desire for closer proximity to in-group members than to out-group members. Chapter 6 investigates the effect of visualised crowding on subjective affect. In study 5, participants who visualised an in-group crowd reported higher positive affect and lower negative affect than those who visualised an out-group crowd. In study 6, the relationship between imagined 'crowding' and affect was mediated by social identification. The relationship between physicality, social identity and 'collective joy' was quantified in a field study (study 7), which also provided suggestive evidence of physical synchrony increasing social identification. A laboratory study (study 8) supported the suggestion that synchronised movement can increase social identification, thus leading to a more positive experience of close proximity. These findings are discussed in terms of a two-way embodiment model of social identity processes in crowds.

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Chapter 1: Introduction and thesis overview

1.1 Introduction

On 22nd of January 2008, I found myself in a familiar situation. I was walking along a street in London amongst a large crowd of people, shoulder to shoulder with those on either side of me, with little room in front or behind. Like others in the crowd, I was being jostled from side to side as I walked, struggling at times to stay on my feet. Having grown up in London, I had walked along crowded streets many times before. I did not usually tend to find being pressed against so many strangers to be a particularly pleasant experience. Christmas shopping on Oxford Street is a definite no-go for me due to the dense crowds and I shudder at the thought of a daily commute on the crowded London Underground¹. But this crowd was different. I *enjoyed* the close proximity of those around me. I welcomed the hug from the stranger next to me as he kissed the top of my balding head, and as I watched the smiles on the faces of those around me as they raised their arms in the air and united in song, I wished that the moment would go on and on.

This was obviously no 'ordinary', everyday crowd of consumers or commuters. My football team – Tottenham Hotspur – had just beaten Arsenal (our arch-rivals) 5-1 to reach our first cup final in nine years. The crowd I was immersed in was made up of fellow Tottenham supporters as we made our way from White Hart Lane (our stadium) to the local station, vociferously celebrating our historic victory.

I have been going to football matches on a regular basis since the early 1990s when I was in my early teens. So although that particular night in 2008 is fresh in my memory, it is just one example from a catalogue of joyful crowd memories that football has provided me with over the years. I consider myself lucky to have experienced standing on the terraces as the crowd swayed from side to side; to have taken a ride on the 'tidal' surge of the crowd as everyone leaned forward in an attempt to see the action. Terrace experiences such as

¹ When initially writing this chapter, a daily commute on the London Underground was simply an unwelcome thought. However, having since taken up full-time employment in central London, the commute on the crowded Tube has become a daily reality. I can confirm that the experience is just as bad in reality as it was when confined to my imagination!

these were consigned to the history books with the introduction of all-seater stadiums for most league sides. However, despite football terraces being a thing of the past, an important goal or victory can still draw strangers physically closer together as they hug and shake hands in celebration in the stands, on the streets, and even on crowded trains – quite a contrast to the behaviour observed and the emotion experienced on those very same trains during morning rush hour.

As I hope to have illustrated with this personal account, exposure to density can be predictive of highly contrasting experiences and personal consequences. This subjective view is reflected by over half a century of crowding research. There seems to be little doubt that exposure to dense crowds can be associated with negative psychological outcomes for those present. Crowding can be associated with increased physiological and psychological stress for commuters on trains (Evans & Wener, 2006) and increased feelings of claustrophobia and frustration for consumers in supermarkets (Aylott & Mitchell, 1998). However, these outcomes are relatively minor when considering examples of extremely high density, which can have catastrophic *physical* consequences. For example, eleven concertgoers were killed in a crush as they made their way into the Riverfront Coliseum (Ohio, Cincinnati) to see The Who play a concert in 1979 (see Johnson, 1987). Ten years later, 96 Liverpool fans lost their lives and many others suffered from serious physical injuries following a crush on the terraces at Hillsborough – the home stadium of Sheffield Wednesday Football Club, which was the host venue for a F.A. Cup semi-final between Liverpool and Nottingham Forest (see Grech, Bellamy, Epstein, & Ramsdale, 1993).

The tragic loss of life at Hillsborough brought issues of crowding and crowd safety to the forefront of public consciousness. Lord Justice Taylor (1990) conducted an inquiry into the disaster and concluded that failures by South Yorkshire Police, the local authority, and Sheffield Wednesday Football Club led to the overcrowded terraces. As a result, Taylor (1990) recommended that stadiums in the old first and second divisions (now called the Premier League and Championship respectively) be converted to all-seater stadiums to minimise the risk of future overcrowding. Twenty years have passed since

Taylor's recommendations were published and there have not been any crowd density related disasters in English football during that time.

When considering this safety record, it seems hard to argue against the suggestion that the abolishment of terraces from English football stadia may have minimised the risk of physical injury from overcrowding. However, that is not to say that it has improved the general experience of all of the fans who safely watched the majority of properly organised matches from the terraces. Indeed, the following personal account of a Hillsborough disaster survivor reveals that even shortly prior to the tragic overcrowding that cost so many their lives in 1989, there was a jovial atmosphere among the Liverpool fans on the packed terrace:

I can remember a beach ball being thrown around, the large multi-coloured ball bouncing off unexpected heads who weren't watching, cheers from all round. The ball was now being thrown between the two pens. Everyone having a good time, very good humoured with the atmosphere building...
(Gary Burns, retrieved 2009)

The tendency for football fans to enjoy standing in close physical proximity to one another did not escape the notice of Lord Justice Taylor. When recommending that all-seater stadiums should become a legal requirement in the wake of the Hillsborough disaster, Taylor (1990, p. 13) acknowledged that many football supporters objected to the imminent loss of terracing, when he wrote:

...to many young men, the camaraderie of singing together, jumping up and down, responding in unison to the naming of the players, their emergence on to the pitch, the scoring of a goal, an unpopular decision – all of these are an integral part of enjoying the match. They like being part of an amorphous seething crowd and do not wish to have each his own place in a seat.

This sentiment is echoed by 'Stand Up Sit Down' (2006) – a lobby group who are campaigning for the re-introduction of standing areas to English football

stadiums. Thus, like me, people *enjoyed* being on the crowded terraces. As will become clear in the chapters that follow, the enjoyment of close proximity to strangers is not limited to football crowds. Anthropological (e.g., Durkheim, 1955/1915), sociological (e.g., Malbon, 1999), historical (e.g., Ehrenreich, 2007; McNeill, 1995) and psychological (e.g., Cassidy, Hopkins, Levine, Pandey, Reicher, & Singh, 2007; Neville & Reicher, 2008) accounts of crowding have shed some light on the potential for high density at nightclubs, raves, religious festivals, community dances, and military and political parades to facilitate ‘collective joy’ among their attendees.

The central aim of this thesis is to determine the question, which has so far been neglected, regarding the conditions under which crowding (density) can be enjoyed, as well as experienced as aversive on some occasions. I will argue that a single theoretical framework (self-categorization theory) should, and can, account for this variability of experience. Moreover, this same framework can account for the evidence that the experience of psychological togetherness can act as both a cause and a consequence of physical unity.

1.2 Thesis overview

Crowding research, which was largely motivated by fears of an impending population boom, peaked during the 1970s and then slowed to a trickle during the 1980s and 1990s before virtually drying up at the start of this century. This begs the question as to why, after such an enthusiastic start, did research into a phenomenon that is an unavoidable and arguably integral part of modern life, come to a virtual standstill? One possible explanation is that the early crowding researchers left us confused due to the fact that they struggled to define the very phenomenon that they sought to explain. As will be shown, this lack of clarity was reflected in crowding theories and as a result, we were, and still are, left with a set of conflicting theoretical approaches to crowding, none of which offers a wholly satisfactory account of the diverse array of crowding responses that are on display as we look around us during the course of our daily lives.

It is hoped that the research presented in this thesis will go some way to re-opening the debate with a fresh theoretical approach to the psychology of crowding. Chapter 2 will present a detailed review of the crowding literature, in which an attempt will be made to define crowding in the context of this body of

work. The chapter will provide a historical overview of crowding research, beginning with the early work that was conducted on animals, and then moving onto the research that attempted to uncover the human consequences of crowding in neighbourhoods, institutions, in the home, the street, at sports events, and in the laboratory. As will become clear, the work to be described failed to uncover a simple generic effect of crowding, and as a result, several theoretical approaches were developed, each with the intention of accounting for the apparent variability in responses to crowding.

Chapter 2 will offer a critical appraisal of some of these theoretical approaches. The bulk of the appraisal will focus on the personal space approach, which suggests that when close physical proximity is perceived as a violation of the self-other boundary, it can serve as an antecedent to potentially aversive psychological consequences of crowding, such as anxiety, discomfort or stress. The personal space approach has been widely accepted as a viable theoretical tool for explaining variable crowding responses. However, as will be shown, the approach is not without its weaknesses, and as such, these weaknesses must be addressed and compensated for before psychological responses to crowding can in fact be understood in terms of so-called personal space.

One of the major weaknesses inherent in the personal space approach is that hypotheses relating to when close proximity will or will not be perceived as a violation of the self-other boundary have often relied on vast lists of disjointed intervening variables as opposed to a unified theoretical framework. A further weakness lies in the fact that there has been a tendency for researchers to frame the self-other boundary as something that is strictly 'personal' – an individual-level variable (although as will be shown, there are exceptions) – and in doing so, they have often overlooked the potential for social identities and group-level processes to influence our perceptions of who we define as 'self' and who we define as 'other', and consequently, whether close proximity will be perceived as an intrusion, or whether it will be welcomed. Another major problem with the traditional personal space approach is that it can only account for whether or not close physical proximity will have a negative impact on a perceiver (i.e., whether or not the self-other boundary has been violated), but it

offers no explanation as to when close proximity might be experienced positively.

The primary aim of this thesis is to address these and other weaknesses in the personal space approach by applying an already established social psychological theory of group processes to the study of spatiality and crowding. Chapter 3 will introduce self-categorization theory (SCT: Turner, Hogg, Oakes, Reicher & Wetherell, 1987) as the theoretical framework that can potentially overcome these problems. This is not the place for a detailed description of SCT. However, in short, SCT suggests that people can self-categorize either according to their unique personal identities (i.e., in terms of their differences from other individuals) or in terms of any one of a potentially infinite range of social identities (i.e., in terms of their similarities to other in-group members and differences from out-group members). According to SCT, when self-categorized according to a social identity, people will perceive in-group members as part of their psychological selves, whilst out-group members will be perceived as 'other'. It is therefore easy to see how this theoretical framework can be applied to the study of spatiality and crowding. If group processes can determine who is self and who is other, they can surely also determine who we want to be close to and when close physical proximity will be perceived as a violation of the self-other boundary. Thus, in theory, it is likely that spatial preferences are not merely a personal variable, but also dependent on group-level processes.

In the chapters that follow, the extent to which SCT can explain spatial variability will be tested empirically. In line with the traditional personal space approach to proximity and crowding, it will be argued that the same processes that might impact upon proximal behaviours in one-to-one interactions will also impact on our desire for, and responses to close proximity in dense crowds. In other words, our perceived psychological relations with those with whom we are sharing a space will determine whether the self-other boundary has been violated regardless of whether we are close to just one person or to a large crowd of people. In fact, it will be argued that if anything, any effects that might emerge from one-to-one interactions might be *magnified* when we are in close proximity to several others in a dense crowd. This suggestion will be based on the theoretical argument that if a crowd is made up of those perceived as

separate from self, a perceiver's zone of selfhood will not be intruded upon from just one direction. Instead, it will be violated from the front, back and sides. However, if the crowd is perceived as self, the perceiver will be surrounded by not just one, but several people with whom they share a sense of unity and togetherness.

Chapter 4 will present the first empirical test of the applicability of SCT to spatial behaviours. In two controlled laboratory experiments designed to examine the impact of group relations on 'personal space', participants will be asked to arrange two chairs for an anticipated discussion with either an in-group member or an out-group member. If, as expected, the group context of an interaction determines whether another person will be perceived as self or other, it follows that participants will seek closer proximity to an in-group member than to an out-group member. Whilst study 1 will be a simple test of group relations on spatiality, study 2 will examine the extent to which participants make use of physical space either as a reflection of their perceived differences from out-group members, or to reconcile perceived differences from other in-group members and hence facilitate intra-group consensus. The experimental paradigm to be described in Chapter 4 will also be modified for the studies presented in Chapter 5. Whilst the focus of Chapter 4 will be the *behavioural* dimension of 'personal' space, Chapter 5 will examine participants' *experience* of either anticipated or actual close proximity to in-group and out-group members.

Chapter 6 will signal a move away from studies of one-to-one interactions towards an investigation of the impact of group relations and physical proximity in small groups and crowds. However, before investigating physically co-present crowds, Chapter 6 will present two studies in which participants will *imagine* themselves immersed in a crowd before taking part in a subsequent task to establish whether imagined density can have psychological consequences similar to those that might be expected following immersion in actual crowds. This experimental paradigm is adapted from a series of studies by Garcia, Weaver, Moskowitz, and Darley (2002), which investigated the impact of imagined co-presence on subsequent helping behaviour. Participants will be asked to imagine being on a densely populated train carriage in various scenarios in which group context will be manipulated.

Rather than focussing on helping behaviour as a dependent variable, the studies will examine how group processes can impact upon participants' desire for space in their visualisations, and more importantly, on their affective state following the visualisation task.

As a natural progression from the laboratory work to be described in this thesis, Chapter 7 will present a field study, which will be carried out at a protest march in central London. As will hopefully become clear during the literature review in Chapter 2, a disproportionate number of crowding studies have focussed on crowd events in which people are unlikely to be united by a shared social identity, with the inevitable consequence being negative responses to such situations. Therefore, the field study presented in Chapter 7 will be conducted at an event in which a shared social identity is likely to be highly salient. This will allow for a test of the relationship between protestors' sense of social identification with their fellow crowd members, their physical relations with those crowd members, and how these variables might interact to impact upon the protestors' positive experience associated with being in the crowd. Chapter 7 will also start to unpack the potential two-way relationship between psychological and physical processes in crowds. To elaborate, the majority of the research described in this thesis will investigate whether a shared social identity can draw people physically closer together. However, the field study described in Chapter 7 will present an opportunity to begin to examine whether being physically immersed in a crowd of people and more importantly, how acting in physical synchrony with those people, might feed back and enhance collective feelings of unity, with the consequence of making close physical proximity a more positive experience.

The initial test of the relationship between synchrony, identity and crowding will be based on the *assumption* that a period of sustained marching, chanting and playing musical instruments will involve some form of synchronised physical movement. A more stringent test of the potential effect of synchronicity on identity and hence the two-way relationship between social identity and physicality will be conducted in a controlled laboratory study, which will be described in Chapter 8. Following this, Chapter 9 will conclude this work with a critical evaluation of how the research presented in this thesis contributes to the crowding literature, both in theoretical and practical terms, and will also

signal potential avenues for future researchers who are interested in a social identity approach to spatiality and crowding.

Chapter 2: The consequences of crowding: Literature review and the personal space approach.

2.1 What does 'crowding' mean?

In the opening chapter, it was suggested that exposure to 'crowding' might evoke diverse responses. This idea will be developed in this chapter by delving more deeply into the literature. This will include an evaluation of both the physiological and psychological effects of crowding on animals and humans, and a discussion of some existing approaches to explaining why exposure to crowding can elicit negative responses in some instances and positive responses in others. However, before continuing with this discussion, it is important to clarify what the term 'crowding' actually means.

As will be shown, crowding can be seen as a phenomenon that occurs in populations, households, institutions, public spaces, or in laboratories. A wide variety of definitions have been proposed over the years. For some, the term 'crowding' refers to density. This can be objective physical density (the amount of space available per person, e.g., Freedman, 1975, 1979), spatial density, (the amount of space available per group of people; e.g., Loo, 1972), or social density (the number of people present within a particular space; e.g., Baum, Aiello, & Calesnick, 1978). For others, crowding is associated with unwelcome close proximity (e.g., Aiello, Epstein, & Karlin, 1975; Evans & Wener, 2007; Worchel & Teddlie, 1976). 'Crowding' has been defined as a negative psychological state associated with exposure to physical density (e.g., Cox et al., 1984), or a situation whereby "the individual's demand for space exceeds the available supply of such space" (Stokols, 1972, p. 75). In other words, there has been substantial disagreement in the literature, with some 'crowding' definitions focussing on physical density, and others focussing on perceivers' evaluations of such density.

In their book – *Too Close For Comfort: The Psychology of Crowding* – Insel and Lindgren (1978) decided that these conflicting definitions and redefinitions rendered crowding as a construct that is simply too complex to define. They explained their position to the reader in the following way: "We shall therefore take the coward's way out by not attempting to construct a

definition of crowding that would in the end satisfy no one. We shall instead talk about crowding as though everyone understands what it means.” (p. 16). Insel and Lindgren (1978) defended their approach by pointing to a precedent in the study of intelligence – a construct that researchers have struggled to define. However, it could be argued that the failure to clearly define ‘intelligence’ has led to confusion in the literature. For this reason, it is unacceptable for the authors of a book on the psychology of crowding to opt out of providing a definition of the construct that is at the centre of their investigation, or to do so based on the premise that the reader will simply know what it means.

I am going to be a little braver in my approach by at least attempting to clarify what crowding means in the context of this body of work. To begin with, there is no reason to suggest that any of the definitions outlined above are any more correct or incorrect than the others. Crowding can mean all of those things (depending on what it is that a researcher is interested in). As such, the review of the literature in this chapter will incorporate research from each approach to highlight the effects that crowding can have when defined broadly. However, for the purpose of theory development in this thesis, the term crowding refers to situations of close physical proximity – the type of proximity that might occur not only in manufactured interactions in the laboratory (as will often be the case in this thesis), but also in naturalistic settings – i.e., in sports stadiums, nightclubs, shopping malls, on public transport, and in town centres. In line with Freedman’s (1975, 1979) definition of crowding, which focuses on density, it is argued that crowding should be seen as a physical condition, but that *psychological* responses to crowding can vary. ‘Crowding’ should not necessarily be seen as something bad, or something to be feared, but as something that can evoke joy as well as stress or anxiety. Although the primary focus of this body of work is physical co-presence and proximity in physical crowds, this chapter will also consider crowding in populations or residences (be them private or institutional), as research into crowding effects on these levels has played an important role in the history of crowding research.

2.2 The implications of a ‘booming’ population

According to the Office for National Statistics (2008), population growth in the United Kingdom has increased over recent decades. This is due to a number of

factors including increased birth rates, decreased death rates, and changes in migration patterns (Office for National Statistics, 2008). Rapid population growth is not exclusive to the UK, however. In the space of just nine years (between 1996 and 2005), the population of the United States of America increased by approximately 27 million people, China saw an increase of approximately 86 million people, whereas the population of India grew by approximately 158 million people (United Nations Statistics Division, 2005). The obvious consequence of such rapid human population growth is that unless populations spread out more and occupy more of the planet surface, exposure to physical crowds will become increasingly more frequent as more and more people fill a limited amount of space. This in turn raises questions regarding how exposure to physical density might impact upon our physiological and psychological well-being.

Psychological research has sought to address this question for almost half a century. In 1961, the chairman of a symposium on the consequences of population growth declared the following: “Now that the rate of human population increase has itself increased to unparalleled proportions, the problems of food supply and standing room become insignificant and academic compared to the problem of increasing stress and decreasing sanity...” (Coon, 1961, p. 427). What is clear from this statement is that the pioneers of crowding research believed that the prognosis for human sanity would be bleak if population growth continued to gather pace. The statistics cited above show us that populations did, and still do, continue to grow in a way that concerned academics such as Coon. Therefore, a review of the crowding literature that has emerged since Coon (1961) expressed his concerns will help to clarify whether his prediction of crowding-induced pathology was well founded.

2.3 Responses to crowding: Evidence from animal studies

It is important to note that Coon’s vision was not based solely on whim, but on the evidence emerging from a series of animal studies. There have been two dominant approaches to studying the effects of population density on animals (Christian, 1961). The first involves placing individuals from a particular species (often mice, rats, or voles) into large groups with a limited amount of space, and to monitor how the crowded environment affects their subsequent behaviour.

The second approach involves housing a colony of animals from a particular species within a limited amount of space (in pens or cages, for example) with ample food, water and nesting material present, and to allow the colony to grow freely to establish how the gradual crowding process might impact upon the animals.

While early examples of both approaches produced similar results, an often-cited example of the latter approach is a series of studies of a domesticated strain of the Norway rat, conducted by Calhoun (1962, 1970). The rat populations were housed in specially designed enclosures and allowed to breed freely. As population density increased, so too did social pathology. Calhoun (1962, 1970) noted that the rats tended to group together – a phenomenon he referred to as “pathological “togetherness”” (Calhoun, 1962, p. 139) – thus increasing density and social interaction in particular areas of the enclosures. Infant mortality was high; female rats were unable to carry and wean their offspring, while adult males displayed abnormal sexual activity and cannibalism. These types of pathological behaviours were collectively referred to as a “behavioral sink” (Calhoun, 1962, p. 139).

Calhoun (1962, 1970, 1976) proposed that the pathological behaviours that resulted from increased social interaction served to limit population numbers. This assumption was based on the fact that the rat populations tended to settle at 150 adults even though they could have grown to 5,000 when the reproductive rate of the rats was considered. However, the apparent pathological effects of density appeared to be long lasting as opposed to being a temporary population control mechanism. When the two healthiest males and four healthiest females were removed from the dense environment and re-housed in a more spacious dwelling, they did not display normal reproductive behaviours, and any offspring that they did manage to produce, did not survive. This was taken as evidence to suggest that populations exposed to high density may have eventually died out (Calhoun, 1962).

Christian (1961) observed similar behavioural responses to high density, this time in mice. For example, female mice displayed abnormal mating patterns and poor rearing of their offspring. However, going beyond Calhoun, Christian (1961) also observed physiological responses to crowding, such as increased adrenocortical activity (which is associated with situations of stress)

and a decline in male reproductive function (characterised by weight decreases of the preputial glands, seminal vesicles, and testes), particularly in low-ranking males (Christian, 1961). In line with Calhoun, researchers interpreted these physiological responses to crowding as an evolved mechanism of population control, triggered by increased incidences of social interaction (e.g., Snyder, 1961).

While many of the negative effects of density and crowding discussed so far have emerged from rodent samples (which might rightfully be seen by some as relatively far removed from humans), they have also been found in samples of non-human primates. Elton and Anderson (1977) imposed space restrictions onto a group of 13 captive baboons by moving one wall of their enclosure at relatively regular intervals (ranging from 30-43 days) until they were left with 50% of their initial space. The long-term crowding that was imposed on the baboons had several consequences, such as an increased frequency of intra-group aggressive displays, culminating in a 'riot', and also an increase in sexual behaviours. When space was at a minimum, infants and low-ranking females became particularly withdrawn from the group. These behavioural changes led the authors to conclude that: "Social disintegration, as well as individual pathology, was the end result of crowding..." (Elton & Anderson, 1977, p. 233).

Similar crowding effects emerged from various monkey samples. Male Japanese macaques displayed increased aggression as population numbers grew – a finding attributed to an increased number of antagonists in the social groups (Eaton, Modahl, & Johnson, 1981), while both male and female Japanese macaques displayed mild and severe aggression when the troop was exposed to acute crowding (approximately 2.3% of the space that they had become accustomed to) (Alexander & Roth, 1971). Similarly, rhesus macaques engaged in an increased number of aggressive competitive behaviours when their living space was reduced by 50% (Southwick, 1967).

The early evidence certainly appeared to hint at density-related pathology in non-human primates – our closest cousins in the animal world. However, the density-aggression link in monkeys may not be as clear-cut as initially feared. One group of researchers have suggested that the aggression observed in the early work might have been a result of either – a) the monkeys being housed in new environments, or b) the monkeys being housed with a large number of

strangers – rather than being a simple effect of crowding per se (de Waal, Aureli, & Judge, 2000). When these potential confounding variables have been accounted for in the experimental design, high density has been shown to lead to an increase in anxiety-related behaviours, but to also lead to a *reduction* in aggression in chimpanzees (e.g., Aureli & de Waal, 1997).

So what possible explanation could there be for this negative correlation between density and aggression in chimpanzees – a correlation that stands in stark contrast to the density-aggression link hypothesised by Calhoun, and hinted at in the early non-human primate research? A likely answer is that unlike rodents, primates can respond to crowding by adopting behavioural strategies which can help them to avoid aggression, or at least minimise its severity (de Waal, 1989). For example, chimpanzees have been shown to avoid conflict when exposed to short-term crowding by reducing the frequency of their social behaviours (Aureli & de Waal, 1997), although some evidence suggests that this could be limited to females (Videan & Fritz, 2007). Like chimpanzees, there is evidence to suggest that capuchins (van Wolkenten, Davis, Gong, & de Waal, 2006) and long-tailed macaques (Aureli, Van Panthaleon Van Eck, & Veenema, 1995) display avoidance behaviours as a response to short-term crowding.

Another strategy employed by non-human primates exposed to crowding is one of tension-reduction. Tension-reduction refers to a situation whereby individuals in a crowded group increase the intensity of intra-group friendly behaviours to actively reduce tension (de Waal, 1989), and is more commonly associated with medium- to long-term crowding (Sannen, Van Elsacker, & Eens, 2004). To illustrate, Judge and de Waal (1997) found that male rhesus monkeys increased grooming and huddling (behaviours known to reduce aggression) when density increased, whereas females displayed an increase in aggression towards kin-group females, but displayed aggression-reduction behaviours (such as increased grooming) towards males and non-kin females. Similar responses to crowding have been found in other non-human primates. Baboons employ tension-reduction strategies such as huddling (Judge, Griffaton, & Fincke, 2006), bonobos increase their grooming behaviours (Paoli, Tacconi, Borgognini Tarli, & Palagi, 2007), and gorillas have also been shown

to employ tension-reduction strategies in response to crowding (Cordoni & Palagi, 2007).

To summarise, as has been shown in the preceding section, crowding can have harmful effects on many mammal species. However, there is evidence to suggest that some non-human primate species can adapt to increased density by employing various behavioural techniques to either avoid or minimise aggression. This raises obvious questions regarding human responses to crowding. Are we doomed to a crowded future characterised by the degeneration of our social relations like Calhoun's rats? Or are we able to cope with crowding like our cousins in the monkey world? Going one step further, might we *enjoy*, and hence seek out 'crowding' as the anecdotes and observations presented in the opening chapter suggest? These are the questions that will be addressed in the following section.

2.4 Human responses to crowding

It is easy to see why the evidence of social pathology as a by-product of crowding in animal studies raised concern among those who were interested in the potential human consequences of crowding. Calhoun's work in particular was published at a time when population numbers were booming, people were 'flocking' to city centres, and displays of so-called 'social pathology' in the form of urban riots and increased drug taking were headline news (Ramsden & Adams, 2009). If, like rats, humans are pre-disposed to display 'pathological togetherness' by gathering in city centres and public spaces, then it follows that the subsequent density might give rise to a 'behavioural sink'.

Ramsden and Adams (2009) recently highlighted the fact that this line of reasoning pervaded popular culture during the 1960s and 1970s. They argued that Calhoun's terminology tapped into the fears of a generation – particularly his description of his rats' pathology as a 'behavioural sink' – with the term 'sink' being long-associated with urban vice and corruption. The accessibility of Calhoun's writing to a non-scientific audience, coupled with his willingness to speculate that his findings would transfer to humans (e.g., Calhoun, 1962, 1970, 1974) ensured that the impact of his work would be far-reaching (Ramsden & Adams, 2009). Ramsden and Adams (2009) provide examples of how Calhoun's work directly influenced politics, popular books and films, and the

popular press, with each linking urban life to a breakdown of social morality and order.

However, the impact of Calhoun's work was perhaps at its greatest in the scientific world, as evidenced by the sheer number of crowding studies that it spawned (Ramsden & Adams, 2009). Although it may be stating the obvious, it is important to point to Baron and Needel's (1980) point that humans and animals are fundamentally different. Humans have the cognitive, linguistic and perceptual capabilities to interpret different crowds in different ways. Thus, whilst the animal and human findings are not directly comparable, several researchers set out to test whether Calhoun's findings really would transfer to human populations. Some of their findings will be discussed below.

One approach to studying the relationship between density and pathology was to examine the extent to which they co-existed in populations. This was investigated on two levels: in the home and in the neighbourhood. Starting at the neighbourhood level, or in other words, at the macro-level, researchers began to unearth what they believed to be a density-pathology relationship in urban settings (e.g., Leyhausen, 1965; for a review see Fischer, Baldassare, & Ofshe, 1975). One study of 656 cities in the U.S. found that neighbourhood crowding (dwellings per square mile) accounted for a significant amount of between-city variance in incidences of rape, robbery, and car theft in large cities (Booth, Welch, & Johnson, 1976). These findings emerged after controlling for variables associated with increased crime-rates, such as ethnicity, education levels, income, age, overall city population size, and number of residents who were native to the city.

While these findings presented a worrying picture of urban life, they only told one side of the story. For example, a study of New York City found that any positive correlations between population density (defined as people per acre and people per residence) and 'pathology' (defined in this case as juvenile delinquency, births out of wedlock, psychiatric hospital admissions, cessation of psychological treatment, and infant mortality) became largely *non-significant* when the effects of ethnicity and income were controlled for (Freedman, Heshka, & Levy, 1975). Several studies have corroborated Freedman et al.'s (1975) findings, as demonstrated in an article by Choldin (1978). Choldin reviewed several macro-level studies designed to investigate the relationship

between population density and a wide range of pathologies, including mortality rates, crime rates, juvenile delinquency, and mental illness. He concluded that positive correlations between density and pathology (when defined as mortality, crime rates or juvenile delinquency) became non-significant when social structural variables, such as 'type of household', were held constant. However it should be noted that the review did uncover evidence of a potential relationship between density and mental illness.

The contrasting views that were briefly discussed above demonstrate that it is difficult to draw firm conclusions from studies conducted at the neighbourhood level. What is more, some of the study designs are open to criticism. The most obvious problem is that as has often been the case in the broad study of crowding phenomena, different neighbourhood-level studies have defined 'crowding' and 'pathology' in different ways, thus leading to different findings (Lawrence, 1974). A further important consideration is that many of the neighbourhood-level studies tend to be based on correlational data. It is therefore impossible to conclude with confidence that just because a so-called density-pathology relationship exists, that one variable is the cause of the other. A final problem with macro-level analyses such as these relates to the unit of measurement. Some studies, such as the one conducted by Booth et al. (1976) have made between-city comparisons, where city was used as the unit of analysis. Therefore, to extrapolate from this study that crowding might lead individuals or sub-groups within a community to display 'pathological' behaviours would be to commit an ecological fallacy (Booth et al., 1976). In other words, when studies are conducted at a macro level, the findings should be interpreted at that level. To elaborate, cities with higher densities might experience higher incidences of 'pathology' than lower density cities. However, there is also likely to be high levels of variation *within* cities. Therefore, some individuals living in low density cities will be more likely to display pathological behaviours than individuals living in high density cities, so to use a city level study to claim an individual level relationship between density and pathology would be misleading.

In order to reduce the problems associated with macro-level analyses, and to glean a clearer picture of the direct effects of crowding on groups and individuals, it is useful to examine the findings from micro-level analyses.

For example, Galle, Gove, and McPherson (1972) explored the effects of household density in Chicago. They examined its impact on domains that are linked to social pathology, such as mortality and fertility rates, poor child rearing, male aggression, and admissions to mental hospitals; pathologies which reflected those observed in Calhoun's rats. When conceptualising density as 'people per room', and 'rooms per housing unit', they found that higher density was related to increases in mortality rates, fertility rates (which stands in contrast to Calhoun's rats, but is still interpreted as 'pathological' by the authors) aggression, and 'poor child rearing', but not to admissions to mental hospitals. These findings held when the influences of social class and ethnicity were controlled for (although Freedman (1975, p. 60) questions the validity of Galle et al.'s (1972) conclusions, claiming that weak correlations emerged only after questionable statistical manipulation took place).

Other studies of household crowding yielded similar results. Gove, Hughes, and Galle (1979) collected data from Chicago residents who were defined as having either high or low socio-economic status. The researchers randomly picked black, white, and 'mixed race' participants from both ends of the social spectrum, who lived in crowded and non-crowded homes (with objective crowding defined as people per room) to obtain a representative sample. It was found that living in crowded homes was associated with negative psychological outcomes such as reduced positive affect, lower self-esteem and happiness levels, and an increase in psychiatric symptoms, incidences of 'nervous breakdown', and feelings of alienation. Crowding was also related to poor physical health, which was defined as insufficient sleep and increased incidence of infectious illnesses. The authors concluded that the relationship between objective crowding and these negative consequences was explained by feelings of excessive social demands and a lack of privacy.

Duckitt (1983) conducted a similar study, this time in a poor area of South Africa, inhabited by black residents. After controlling for variables such as sex, age, marital status, whether the participants had parents, what kind of job they had, their income, their education level, and the type of house that they lived in, it was found that 'crowding' (defined as the people-to-room ratio within each household) was associated with an increase in negative affect, but it did not appear to decrease positive affect. It is important to note, however, that while

significant, the correlation between 'crowding' and negative affect was just $r = .17$, even though the sample size was large (433 participants). So while significant, this effect was relatively small.

More recent research has also linked residential crowding with negative outcomes. Evans, Lepore, and Allen (2000) investigated the relationship between culture and tolerance of household crowding. Four groups of American residents were contacted by telephone and interviewed. These groups represented Anglo-Americans, African-Americans, Mexican-Americans, and Vietnamese-Americans. Like much of the residential crowding research that preceded Evans et al. (2000), it was found that density (again defined as people per room within a household) was positively correlated with psychological distress, regardless of the cultural background of the respondents.

Although a great deal of research links household crowding with negative psychological outcomes, the relationship does not appear to be straightforward or automatic. For example, Evans, Lepore, and Schroeder (1996) found that architectural features of the home might significantly reduce the psychologically harmful effects of crowding. Specifically, it was found that people living in homes with greater 'depth' were less likely to experience psychological distress associated with crowding (with crowding defined as people per room). 'Depth' was defined as: "the number of spaces one must pass through in order to get from one point in a structure to one or more specific termini" (Evans et al., 1996, p. 42). The authors suggested that greater depth to a household created more degrees of separation between housemates. As a result of this structural separation, participants may have felt less need to withdraw from their housemates, thus strengthening social relationships and ameliorating the negative effects of crowding (for more on the relationship between social withdrawal and the negative consequences of residential crowding, see Baum & Valins, 1979; Evans & Lepore, 1993; Lepore, Evans, & Schneider, 1991). Thus, it appears that it might not be household density per se that leads to pathology. Instead, it appears that unavoidable crowding leads to social withdrawal, resulting in a breakdown in social relations, and thus a loss of social support.

Studies of household crowding provide a useful insight into the effects of residential crowding. However, it should be considered that participants in

these types of studies were free to leave the crowded environment as and when they pleased. Therefore, studies of institutional crowding provide an opportunity to examine the density-pathology relationship when escape is not possible. Prisons provide an ideal backdrop for research of this nature.

Prison populations in the U.S. increased by 94% between 1975 and 1980 (National Institute of Justice, 1980, as cited in Cox, Paulus, & McCain, 1984) and then quadrupled between 1980 and 2003 (Bureau of Justice Statistics, 2004, as cited in Franklin, Franklin, & Pratt, 2006). There were also large increases in the prison populations of England and Wales between 1992 and 2002, with the female and male populations increasing by 184% and 57% respectively (Home Office, 2002). The construction of new prisons has not matched the demands that these population increases have placed on penal systems, leading to a situation widely seen as one of overcrowding in both the U.S. (Franklin et al., 2006) and in England and Wales (The Howard League for Penal Reform, 2006).

A large body of research investigating the effects of overcrowding in prisons has emerged. In a cross-institutional study, Cox et al. (1984) found that population increases in prisons which had not expanded their facilities were associated with increases in disciplinary problems, death rates, suicide rates, and commitment to psychiatric units. The opposite pattern emerged when prisons saw their populations decrease. Like many of the researchers who investigated the impact of density on animals, Cox et al. (1984) attributed these pathological effects to the frequent social interactions and subsequent overstimulation and stress that come with increased density. This stands in contrast to the social withdrawal explanation that is put forward in the household crowding literature. However, this discrepancy makes sense as the nature of social relations in prisons and households might be expected to be qualitatively different – thus, social interaction in a hostile prison environment might cause distress, but might be a source of support in a home environment, such as a university hall of residence.

Negative consequences of crowding in prisons have also emerged when studies have focussed on inmates within institutions as opposed to making between-institution comparisons. D'Atri (1975) conducted a study on inmates in three U.S. prisons. In each of the prisons, inmates were housed in either small

cells (one or two person cells) or large dormitories. The inmates in the dormitories were found to have higher blood pressure than those in the smaller cells – a finding attributed to the stress of ‘crowded’ living (see also, Paulus, McCain, & Cox, 1978). D’Atri, Fitzgerald, Kasl, and Ostfel (1981), supplemented this finding with a longitudinal analysis. It was found that inmates who were moved from single-occupancy cells to multiple-occupancy dormitories experienced a rise in blood pressure, whereas the blood pressure of inmates who were left in single cells remained the same, thus adding further credence to the suggestion that these physiological effects were due to the crowded environments.

While evidence suggests that prison crowding is related to physiological changes such as raised blood pressure, there is also evidence to suggest that it might be related to a range of other pathological outcomes. To use one example, illness complaints were more frequent for participants housed in dormitories as opposed to single cells (McCain, Cox, and Paulus, 1976), and for those housed in the more densely populated of two prisons (Wener & Keys, 1988), which could be indicative of differences in actual or imagined illness.

As has been the case for both neighbourhood and household density, several studies of institutional density have produced contradictory results – arguably due to the fact that ‘pathology’ has been so broadly defined. To illustrate, whilst the studies described above examined the relation between crowding and pathology, with pathology defined as perceived or actual illness, other studies have examined the relation between crowding and pathological *behaviours*, such as inmate misconduct or aggression. Franklin et al. (2006) meta-analysed 16 such studies and concluded that prison crowding does not necessarily lead to inmate misconduct, whilst Gaes (1994) claimed in a literature review that evidence of a direct link between crowding and inmate violence is weak, and suggested that it seems more likely that other variables, such as prison management practices, might mediate any density effects. Steiner and Wooldredge (2009) agreed that prison research has produced contradictory evidence of crowding effects. They claim that this could be due to inconsistencies in the definitions and measures of both crowding and misconduct, and the fact that many researchers have failed to consider potential mediating variables, such as inmate involvement in educational or vocational

courses, the level of inmate supervision, and related to this last point, whether a particular area of a prison facilitates misconduct because it is more secluded.

Based on the evidence presented so far, it seems that while on the one hand there is evidence of a crowding-pathology relationship (with pathology including illness, stress and (anti) social behaviour), on the other, there is evidence to suggest that this is by no means an inevitable outcome. The work discussed so far has been limited to neighbourhoods, households, or institutions. The problems associated with neighbourhood level analyses were outlined above. While many of the same criticisms can be levelled at studies conducted at the household or institutional level (i.e., that they often use correlation data, and are inconsistent in their definitions of (i) crowding, and (ii) pathology), they at least make it possible to reduce the number of extraneous variables by allowing for stricter control over the sample. It also becomes easier to make direct inferences from the sample statistics as the study designs often use specially designed individual self-report or behavioural data, rather than utilising official administrative data and then extrapolating from it. However, the residential work has tended to examine crowding effects in either special circumstances where escape is impossible (such as institutions), or in small units where the 'crowds' are made of acquaintances, friends, or family members (i.e., in residences). What of physical crowds of people, which largely consist of strangers; the type we might find on an everyday basis in the street, on trains, in clubs, in sporting venues, etc? Perhaps more even more pertinent, what of pseudo crowds that one might encounter in the controlled laboratory environment?

There is a large body of research designed to examine responses to density in both experimentally manufactured and naturally occurring crowds. Again, work conducted in this area has shown that physical crowds of people can give rise to a diverse range of psychological outcomes, although the quantitative work certainly seems to be heavily weighted towards supporting the density-pathology relationship.

Starting with studies conducted in the laboratory, participants exposed to high density reported higher levels of negative affect, evaluated the room more negatively, and rated the experimental procedure as less pleasant, less worthy, and less interesting, than participants exposed to low density (Griffitt & Veitch,

1971). Research has also shown that experimentally manipulated density can result in reductions in both interpersonal attraction and altruism (Veitch & Arkkelin, 1995), whereas Sherrod (1974) demonstrated that while crowding did not directly impact on task performance, participants who had previously been exposed to crowding were more likely to display frustration on a subsequent (non-crowded) task. These studies have examined the effect that crowding has on negative mood. However, Prerost (1981) found that rather than leading to an increase in negative affect, crowding inhibited participants' positive mood.

In contrast, Aiello, Thompson, & Brodzinsky (1983) found that although participants reported highest stress and discomfort levels when they were exposed to high density, those in the high density conditions gleaned greater pleasure from listening to clips from various comedy shows than did participants who listened to the same clips in less crowded environments. This finding hints at the potential for crowded environments to facilitate positive emotions. Similarly, Schultz-Gambard (1977) found that although high density led participants to feel more stressed, to rate the room as more unpleasant, less comfortable, and less cosy, they felt more positive towards other crowd members when they felt they belonged to a common group. This idea will be explored extensively in the chapters that follow.

While there is some evidence of positive responses to crowding in the laboratory, it is somewhat limited. Work that has been conducted out in the field is even more mixed. Starting with the negatives, two studies conducted by Mackintosh, West, and Saegert, (1975) examined the effects of crowding in public spaces. Participants were taken to either a shoe store (study 1) or a train station (study 2) in either busy or quiet periods. In study 1, participants were left in the busy store to write descriptions about twelve pairs of shoes and three other shoppers. In a subsequent task, participants were taken to another part of the store and asked to a) draw a map of where the shoes that they had described were located, b) the characteristics of the shoes and the other shoppers, and c) to rate how likeable the shoes and the other shoppers were. While there was no effect of likeability on shoe or person rating, participants in the high density condition were less able than those in the low density condition when it came to reproducing an accurate map and correctly recalling the characteristics of the shoes, which suggests some cognitive 'overload'. In study

2, having been left to complete 42 simple tasks in either a crowded or uncrowded train station, participants in the crowded station reported higher levels of negative affect and scepticism.

Further field studies have lent support to the view that crowding can give rise to negative outcomes. Commuters on crowded trains have been shown to display increased physiological and psychological stress (Evans & Wener, 2006), whereas consumers in supermarkets reported feelings of claustrophobia and frustration (Aylott & Mitchell, 1998).

However, as has been the case with each area of crowding research discussed so far, there have been conflicting findings. For example, Proshansky, Ittelson, and Rivlin (1976) suggested the following anecdotally: "Crowding may be pleasurable as well as painful. Some people thrill to the excitement of the crowded city. Other things being equal, a large crowd is a good indication at the theatre, stadium, beach, or party" (p. 179). Proshansky et al.'s claim has received recent empirical support. For example, in an online questionnaire study designed to investigate the variables that contribute to atmosphere and home advantage in English football grounds, it was found that a full capacity crowd is considered to be more important for a 'good atmosphere' than the actual number of people in attendance (Charleston, 2008).

However, a clearer demonstration of positive responses to crowding comes in the form of a study conducted by Cassidy, Hopkins, Levine, Pandey, Reicher, & Singh (2007) at the Magh Mela. The Magh Mela is a Hindu festival, which takes place in India for a month every year. The festival becomes densely populated. Sanitary conditions and facilities are extremely poor, and attendees are exposed to constant loud noise. If a clear density-pathology relationship existed, conditions such as these would be expected to give rise to widespread psychological deterioration. However, both qualitative (interviews) and quantitative (questionnaire) methods of data collection revealed extremely positive mood states among respondents.

Cassidy et al. (2007) presented a psychological analysis of collective joy at religious festivals – a phenomenon that has been extensively documented and researched from the perspective of sociologists and anthropologists interested in collective ritual. For example, following an extensive period of ethnographic

study of aboriginal societies in Australia, Durkheim (1915/1976) theorised that religious collectives could experience what he called 'collective effervescence' – an intense feeling of joy that not only emerged in collective ritual, but depended upon physical co-presence. According to Durkheim (1915/1976, p. 215):

The very fact of the concentration acts as an exceptionally powerful stimulant. When they are once come together, a sort of electricity is formed by their collecting which quickly transports them to an extraordinary degree of exaltation.

Thus, according to Durkheim, this 'electricity' and 'exaltation', or in other words 'collective joy' that is associated with religious ritual is a product of physical co-presence. However, as noted by Olaveson (2001), Durkheim's concept of collective effervescence referred to an altered state of consciousness – a state of ecstasy. Durkheim associated this 'ecstasy', which might have been a thoroughly enjoyable, positive subjective experience, with delirium and pathology. To illustrate, when discussing the joyous states associated with of religious ritual, Durkheim (1915/1976, p. 226) commented:

It is certainly true that religious life cannot attain a certain degree of intensity without implying a physical exaltation not far removed from *delirium*. That is why the prophets, the founders of religions, the great saints, in a word, the men whose religious consciousness is exceptionally sensitive, very frequently give signs of an excessive nervousness that is even pathological.

Despite Durkheim's interpretation of religious ritual as something pathological, his observations lent weight to the argument that dense collectivities can facilitate positive emotions. Collective joy, however, is in no way limited to religious crowds. As already mentioned in the previous chapter, there are countless anecdotal examples of positive responses to immersion in crowds. Ehrenreich (2007) discussed many of these in a recent historical account of 'collective joy'. As well as religious festivals and rituals, Ehrenreich (2007) provides a detailed overview of collective events throughout history,

such as carnivals, military processions (see also: McNeill, 1995), nightclubs (see also: Malbon, 1999), and sporting events (see also: Morris, 1981; Neville & Reicher, 2008), which have operated as a platform from which people can come together to transcend the barriers of social class and ethnicity, and unite, perhaps only fleetingly, in feelings of collective comfort, pleasure, and joy. However, Ehrenreich (2007) also makes an important point when she highlights that even when there is clear evidence of such collective joy, it is often labelled by those outside as something pathological, with tag-words such as 'hysteria' or 'mania' (or in Durkheim's case - delirium). 'Beatle-mania' is an example of this.

This brings the current section to a close. To summarise, it seems that rather than leading to a generic aversive response, exposure to crowding can evoke variable responses, be it in cities, neighbourhoods, households, institutions, public spaces, or in laboratories. While much of this variation relates to when crowding, will, or will not be experienced negatively, there has been some acknowledgement of the potential positives of crowding – sometimes from psychologists, but more often from historians, anthropologists, or sociologists. Some of the work has attempted to explain why residential crowding might be experienced so variably. For some, the answer lies with architectural features promoting social withdrawal, or encouraging people to make and maintain supportive social networks. For others, it is due to unavoidable social interaction and hence stressful 'over-stimulation' that comes with crowding in institutional settings. For others still, the answer lies with inconsistent methodologies and definitions. However, so far, there has been no discussion of theoretical approaches which attempt to explain variable responses to exposure to large physical crowds – those at the religious festival, nightclub and football terrace. The following sections will introduce, and critique some theoretical approaches to such variability in responses to, and desire for crowding.

2.5 Explaining variable responses to crowding

As demonstrated in the previous section, 'crowding' can evoke a diverse range of psychological responses. Several attempts have been made to explain when, and why, crowding might be experienced in a particular way. These were criticised for their limited application as they often only accounted for residential

crowding. The sections that follow will focus on variable responses to physical proximity and density in physically co-present crowds in laboratories and naturalistic environments.

For some, variable responses to crowding can be attributed to individual differences and perceptions. One of the first psychologists to question the density-pathology link, and to suggest that crowding might be associated with positive outcomes, was Jonathan Freedman (1975). Freedman claimed that exposure to physical density served to intensify a person's typical response to others co-present. According to Freedman (1975, p. 105), "...high density makes other people a more important stimulus and thereby intensifies the typical reaction to them". In other words, if a person typically experiences close proximity to certain people as aversive, density will strengthen the aversion, whereas if they experience close proximity as pleasant, density will make it more so. Freedman also claimed that certain situations are unpleasant (such as being on an underground train) whereas others are pleasant (such as being at a sports match), and that high density will intensify these situational responses. Freedman (1975) elaborated on this by saying that even in a 'positive' crowd, there becomes a point whereby density becomes unpleasant due to "physical discomfort, odors, and lack of freedom to move" (p. 93).

At first glance, Freedman's theory makes a lot of sense. It can certainly account for intra-individual variations in crowding responses. However, it is open to criticism. Let us assume that density does simply intensify typical reactions to certain people. Now imagine a football fan standing on a terrace watching his team. His team scores a goal and the man finds himself jumping for joy. He then finds himself roughly jostled by other fans in his immediate vicinity. A stranger standing next to him reaches out, grabs the man, and embraces him in a hug, as does the stranger's friend. Despite the sweat on their t-shirts and their terrible body odour, the man joyfully hugs them back. Does this imply that the man usually likes being near sweaty, smelly strangers, but density just exacerbates this and makes it joyful?

Freedman might concede that in this situation, something is operating other than an intensified typical response to the men. Instead, it could be that being at a sports event is enjoyable, and therefore, the density increased enjoyment *despite* the odious crowd members. However, the flip side must

then hold for this to be true. In other words, the unpleasant journey on the underground must simply become more unpleasant when there are lots of people squashed together in a carriage. Now imagine that the same man is on his way home from the football match on an underground train. He is surrounded by yet more, sweaty, smelly men and cannot move. The men support his team, who have just won their match. They are laughing and chanting and the man joins in. Thus, in this situation he is in a normally aversive situation (on a crowded train), surrounded by normally aversive people (sweaty and smelly men), yet he is having a thoroughly positive experience. It is difficult to see how Freedman's (1975) density-intensity theory can explain the man's response to this scenario. Granted, it is a hypothetical scenario, but it is not an implausible one.

A recent paper by Drury, Cocking, and Reicher (2009) casts further doubt on Freedman's (1975) approach. Drury et al. (2009) interviewed survivors of the 2005 London bombings, many of whom had been on packed underground trains during the morning rush hour. As much research has shown, close proximity to commuters on crowded underground trains can be a source of stress and discomfort (e.g., Evans & Wener, 2007). Therefore, if Freedman's theory were true, and density simply intensifies existing feelings towards other people, the survivors of the London bombings should have simply experienced greater aversion to those around them on the packed trains. However, an external event (the detonation of a bomb) led survivors to act in pro-social ways towards strangers – showing concern and offering assistance. Of course, it is not being suggested that any of the survivors felt joyful or elated. However, Drury et al.'s (2009) work demonstrates that contextual variables can alter our perceptions of fellow crowd members, which stands in stark contrast to Freedman's suggestion that density simply intensifies our (pre) existing states.

It seems that what is missing from Freedman's theory is some acknowledgement that the nature of the relations between crowd members can be influenced by contextual variations (e.g., scoring a goal, or coming under threat), rather than being a symptom of individual likes and dislikes. Rather than reducing crowding responses to individual perceptions, they should be seen as social psychological phenomena and treated as such. Despite this, like Freedman, several psychologists have implicated individual-level variables

when explaining responses to crowding (although these often relate to when a crowd will or will not be experienced negatively rather than when it might be experienced positively). These individual-level variables have included feelings of being blocked from attaining a particular goal (Proshansky et al., 1976), a lack of privacy (Altman, 1975), sensory overload (Milgram, 1970), and loss of control (Baron & Rodin, 1978).

In contrast to these one-dimensional individualistic approaches, other researchers have outlined a wide range of potential mediators between physical density and psychological response. For example, Rosenthal and Mayer (1983) highlighted the fact that crowding research designs tended to be oversimplified, and that rather than singling out one or two independent variables, researchers should instead consider multiple interacting determinants of crowding. To compensate, Rosenthal and Mayer (1983) outlined *ten* explanatory variables. According to the authors, “These are (including the number of S’s per constant space which, of course, is the crowding variable itself) the types of activity the S’s are engaged in, the cubic volume of space available to each S, the hedonic, aesthetic, and architectural responses to space...” and also, “...varieties of interpersonal contact, duration of contact, external and internal stimulation, the environmental background or context in which the crowding event occurs, breaks in the situation, and the geographic origins and other socio-economic characteristics of the S’s who participate in crowded situations” (Rosenthal & Mayer, 1983, p. 96).

It could be argued that in providing such a comprehensive list, Rosenthal and Mayer (1983) have overcompensated for the simplistic approaches that they are so critical of. Whilst in some cases, each of their variables might influence crowding responses, they simply provided a list of variables, rather than a theory which links them. More importantly, their list falls short when applied to some real world examples. Let us go back to football for another anecdotal example. For a male, English, working class football fan attending a match alone, wearing neutral clothing, and standing on a crowded terrace, most of the variables on the list would be held constant. However, his response to the crowding would probably vary depending on whether he was surrounded by fans of his team (potentially positive response), or whether he had accidentally

been issued a ticket for the opposing team's terrace (potentially negative response).

It could be argued that the two variables on Rosenthal and Mayer's (1983) list which might best account for this football fans' positive or negative response might be (i) variety in the nature of interpersonal contact, and (ii) internal and external stimulation. The problem with the first is that Rosenthal and Mayer distinguished between interpersonal contact on a business or personal level, whether the contact is based on a hobby, whether it involves touching or kissing, whether it involves *overt* hostility, and the list goes on. In the scenario discussed above, it is possible that none of these would vary between the two scenarios. The 'away' fans would have no reason to suspect that the fan was one of the 'enemy', and would therefore display no overt hostility. They would all be there because they share a 'hobby' or interest, the level of touching would be the same, and so on. Using internal and external stimulation (as defined by Rosenthal and Mayer) as explanatory variables is also problematic. First, they relate external stimulation to factors such as noise levels, which would be constant across the two scenarios, and second, they equate internal stimulation to variables such as personality, or alcohol and drug consumption. Again, it is unlikely that there would be any between-scenario variance on these dimensions.

Some of the crowding theories discussed so far have been criticised for being overly individualistic – e.g., they focus on intra-individual processes, or fixed individual characteristics. In doing so, they exclude the 'social' from something that should, in many respects, be seen as a social phenomenon. Others have been criticised for being overly simplistic when considering the influence of other people on the individual perceiver (e.g., Freedman's, 1975 theory). Others still have been criticised for leaving us with a long list of disjointed variables and lacking a workable theoretical framework that can be applied to diverse crowding responses. So far, there has been little consideration of the ways in which *contextual variables* might (a) influence crowd members' perceptions of themselves and those around them, (b) impact upon the relations between crowd members, and (c) how these relations might subsequently impact upon the experience of close proximity and crowding. In the following section, the personal space approach to crowding will be

discussed as a potential first step towards overcoming these theoretical shortcomings.

2.6 Personal space

One well-established theoretical approach that has been used to explain variation in a) interpersonal proximity, and b) responses to crowding, while considering physical relations between crowd members, is that of personal space (e.g., Evans & Wener, 2007; Freedman, 1975; Worchel & Teddlie, 1976; Worchel & Yohai, 1979). Personal space was originally studied during the 1950s in relation to territoriality – the territorial behaviour observed in animals (e.g. Hediger, 1955). However, the concept was later developed to incorporate human social conduct, and was described by Sommer (1969, p. 26) as “an area with invisible boundaries surrounding a person’s body into which intruders may not come”. The logic behind applying the concept of personal space to crowding is that crowding will be experienced negatively when (a) a perceiver becomes negatively aroused by a personal space intrusion, and then (b) attributes that arousal to others in the environment (e.g., Worchel & Teddlie, 1976). Goffman (1971, p. 30) summed this up in his description of personal space as “the space surrounding an individual where within which an entering other causes the individual to feel encroached upon, leading him to show displeasure and sometimes to withdraw”.

There is empirical support for Goffman’s prediction. An example of this is a classic early personal space study conducted by Felipe and Sommer (1966). In an experimental design which might raise a few eyebrows on a modern-day ethics committee, patients in a psychiatric hospital were approached by a confederate. In the two experimental conditions, the confederate sat six inches away from the patients (or ‘victims’, as the authors called them) and either looked at the participant while taking notes and ‘jiggling his keys’, or simply sat there while occasionally ‘jiggling his keys’ (Felipe & Sommer, 1966). In the control condition, the confederate simply sat at the opposite end of a bench to the patients. It was found that the hospital patients were more likely to leave the bench when the confederate sat very close to them, or in other words, ‘invaded’ their personal space.

Of course, this study is open to criticism. Most importantly, the fact that the study was conducted on patients in a psychiatric hospital raises questions regarding whether the findings will generalise to other populations in other settings. Felipe and Sommer (1966) acknowledged this and carried out a similar study to compensate, this time in a university library. A female confederate approached female students who were working alone at a large table. The confederate sat at five varying distances from the participants, ranging from approximately three inches between the adjacent chairs at one extreme (condition one), to four feet (and the table) separating the chairs at the other extreme (condition five). In the three middle conditions, the experimenter left distances that ranged from 15 inches to two chairs' width between herself and the participants. There was also a control condition, in which students were observed from a distance. It was found that participants were significantly more likely to leave the table, or to 'take flight' in condition one (the closest condition) as opposed to the other four conditions combined. The researchers also noted that when the participants did not leave the table, they responded to personal space intrusions by erecting barriers with their books, bags and coats, or they physically turned away from the experimenter (Felipe & Sommer, 1966). Barash (1973) observed similar responses, again in a university library. However, the tendency of participants (who were students) to 'take flight' was stronger when the confederate was wearing a suit (faculty attire) as opposed to jeans and a t-shirt (student attire), thus giving further credence to the suggestion that personal space intrusions will evoke a negative *behavioural* response, but raising questions regarding when this might happen.

At first glance, these studies appear to support the suggestion that personal space intrusions will lead to social withdrawal. However, it could be argued that the participants were not simply responding to the close physical proximity of the experimenters, but instead to their anti-normative behaviour. Participants may have perceived a stranger's decision to sit in close proximity when there were plenty of spatial alternatives as unusual – even threatening – and this may have caused their observed defensive behavioural responses.

However, in another ethically questionable, yet undeniably creative experimental design, Middlemist, Knowles, and Matter (1976) noted *physiological* responses to personal space invasion. Central to their

investigation was the premise that physiological arousal (brought on by stress) affects male urinary function. According to the authors, stress will impact upon relaxation of the external sphincter, thus increasing the length of time that it will take for urination to begin. In addition, increased intra-vesicle pressure, again brought on by stress, will shorten the length of urination. Therefore, the authors hypothesised that personal space invasions would lead to delayed onset, and decreased length of urination, brought on by stress. The experimenters occupied a university lavatory to test this hypothesis. The lavatory had three urinals. In the two experimental conditions, a confederate appeared to urinate at one urinal, while an 'out of order' sign was placed on another, leaving the third urinal free. This configuration was arranged so that in the 'close distance' condition, the participant was forced to urinate at the urinal adjacent to the confederate. In the 'moderate distance' condition, one urinal was left between the participant and the confederate. In the control condition, the participant was left to urinate alone with both of the other urinals marked as out of order. Meanwhile, a second experimenter hid himself away in a cubicle, armed with a stopwatch and a periscopic prism to allow him to see under the door to visualise the participants' urine flow. As predicted, it was found that urination onset was slowest, and the flow-duration shortest, in the 'close' condition, followed by the 'moderate distance' condition, and then quickest, and longest, in the control condition. While these findings tell us nothing about potential mediating variables, such as privacy invasions, or 'performance anxiety', they do highlight the potential negative physiological responses associated with personal space invasions.

2.6.1 Determinants of personal space

So just how much personal space do we need before 'taking flight', experiencing discomfort, or showing signs of negative physiological arousal? Sommer (1969) suggested that a person in a crowd requires *at least* two square feet of personal space. However, empirical observations have suggested that a wide array of intervening variables can influence how much space people seek from others. Logic therefore suggests that as personal space zones vary, so too will people's responses to physical proximity in crowds. Some of the variables that can impact on proximity preferences will be briefly discussed here

(for extensive reviews, see: Altman, 1975; Altman & Vinsel, 1977; Hayduk, 1983).

One approach to explaining variability in personal space is to consider cross-cultural variation (e.g., Hall, 1966). Edward Hall – an anthropologist who was one of the pioneers of personal space research (which is also called *proxemics*) – claimed that American people (and hence, ‘Westerners’) tend to use four types of personal space distances. These range from intimate distances (ranging from physical contact to eighteen inches), through to personal distances (ranging from one and a half feet to four feet), social distances (ranging from four feet to twelve feet), and finally, public distances (ranging from twelve feet to twenty-five feet and greater) (Hall, 1966, 1976).

Hall suggested that although these categories also exist in non-Western cultures, the actual distances within each category might vary. Following an extensive qualitative research programme, Hall (1966) concluded that Latin, Arab, and Asian individuals seek closer proximity than do Westerners, and that they will subsequently experience inter-personal close proximity to strangers, business associates, and other (non-intimate) acquaintances more positively. To use an illustrative example, a business meeting between an Asian and an American might become awkward due to both having different, culturally determined ideas as to what constitutes an appropriate distance. They might both seek to interact at a ‘social distance’, but a social distance in America might be further than a social distance in parts of Asia. Thus, as the American moves further and further away to feel more at ease, the Asian will feel less comfortable, and thus seek closer proximity, resulting in an uncomfortable game of ‘cat and mouse’. When transferring this culturally determined proximity principle to crowding, Hall (1965, p. 191) went as far as suggesting “culture is possibly the most significant single variable in determining what constitutes stressful density” (as cited in Lawrence, 1974, p. 714).

Although there is empirical evidence of cross-cultural variations in personal space (e.g., Aiello & Thompson, 1980; Beaulieu, 2004; Lomranz, 1976; Smith, 1981; Sussman & Rosenfeld, 1982), a cultural approach is far too simplistic. To illustrate, consider Hall’s (1976, p. 164) following assertion: “For members of a non-contact group, it is taboo to relax and enjoy bodily contact with strangers!”. Altman and Vinsel (1977) agreed with Hall. When discussing the discomfort

experienced by Americans ‘subjected’ to contact at intimate distances in public spaces, they said: “It is easy to demonstrate these feelings of discomfort by asking people to face one another within the intimate zone. People almost invariably become tense, giggle with discomfort, avert their gaze, turn their bodies away from one another, or act in other ways to make this distance psychologically less intimate” (Altman & Vinsel, 1977, p. 184). This may be the case for some participants in the laboratory, aware that their behaviour is under scrutiny from an experimenter. It may also hold for some naturalistic scenarios, such as on the London Underground or the New York Subway during rush hour. However, the claim that such responses are “almost invariable” is a fallacy. As highlighted in Chapter 1, English people and Americans – both defined as belonging to ‘non-contact’ groups – *do* sometimes relax when experiencing close physical contact with strangers, and they often enjoy it (see also, Chapters 7 & 8). Rather than responding awkwardly, giggling, and turning away, etc., people often embrace strangers in their intimate zones, turning to face them to dance, chant and celebrate.

There must therefore be alternative explanations for *within*-culture variations in personal space. Indeed, a long-list of intervening variables has emerged over the years. Altman and Vinsel (1977) suggested that these should be broken down into three categories: individual factors, setting-environmental factors, and interpersonal factors. Each of these will be addressed in turn.

Individual factors: As suggested by its title, the first category is comprised of factors that relate to the individual perceiver, or in other words, demographic variables, such as age and sex. There is evidence of each of these having an effect on personal space. With regards to age effects, young children have been shown to require less space than those approaching adulthood (Aiello & Aiello, 1974), whereas young women have been shown to require less personal space than elderly women (Winogrand, 1981), thus suggesting that interpersonal distancing might increase from childhood through to adulthood.

The effect of an individual’s sex on their spatial behaviours has received more attention, and although the findings seem to be inconsistent (Hayduk, 1983), Uzzell and Horne (2006) claimed that the consensus in the early

literature was that there is a tendency for women to require less personal space than men (for example, see Sussman & Rosenfeld, 1982). However, there is evidence to suggest that rather than women simply requiring less space than men, there might instead be a sex effect when the physical orientation of a personal space invasion is considered, with men responding more negatively to 'face-to-face' invasions, and women responding more negatively when intruded upon from the side (Fisher & Byrne, 1975). Uzzell and Horne (2006) have recently gone further by claiming that biological sex has less impact on personal space (or interpersonal distance, as they call it) than gender role, which is acquired through social learning. They found that regardless of biological sex, people who scored high in masculinity sought greater distances than those who scored high in femininity.

Setting-environmental factors: Situational factors, external to the perceiver, can also have an influence on personal space. One example is whether an interaction takes place indoors or outdoors. Participants approached by an experimenter in an outdoor setting required smaller distances before experiencing discomfort than those approached in an indoor setting (Cochran, Hale, & Hissam, 1984). The authors suggested that these differences might be understood in terms of the amount of vertical space available to the participants. To elaborate, the authors proposed that as vertical space (the space above participants' heads) increased, their horizontal space (the space between them and the experimenter) would decrease accordingly, as was shown to be the case.

Further aspects of the indoor environment can influence personal space. Gifford and Sacilotto (1993) conducted a field-study on female office workers who were matched for age, status within the organisation, wages, person-orientation (the extent to which they were oriented to learning about other people), and thing-orientation (the extent to which they were oriented to learning about non-human animals, machines, and objects). The main difference between the two groups of women was the design of their workspace. Women in the 'social-isolation' group worked at desks separated by screens, whereas women in the 'non-isolated' condition worked at desks in small workspaces, which facilitated social interaction. Women from both conditions were asked to approach an experimenter to take part in a seemingly unrelated task. Following

their approach, the distance that they left between themselves and the experimenter was measured. It was found that women who worked in isolation required significantly more personal space than those who worked in a non-isolated environment. Gifford and Sacilotto (1993) suggested that the women who worked in isolation had become accustomed to low levels of social stimulation, and thus sought greater distances when interacting to maintain these low stimulation levels.

Interpersonal factors: The third category relates to the extent to which the attributes of a potential interaction partner, or the psychological relationship between an individual and their potential interaction partner can impact upon their personal space. This was an area first addressed by Hall (1966) in his qualitative assessment of personal space. Hall stipulated that people would seek closer proximity to friends and relatives than to business associates or strangers. Following a review of quantitative investigations of personal space, Sundstrom and Altman (1976) agreed that interpersonal relationships could impact on spatial behaviours. They concluded that the relationship between close proximity and subjective comfort would be dependent on the relationship between interactants. They suggested that dyads made up of friends would feel the most comfortable when interacting at close proximity, followed by dyads of strangers who were expecting interaction. Finally, they suggested that pairs made up of strangers who were not expecting to interact with one another would feel the most discomfort when experiencing close proximity. While such a theory makes perfect sense, it does not take into account other factors that might influence the relationship between two interacting *strangers*.

As shown in the section on 'individual factors', the age and sex of an individual can have an effect on the distances that they seek from others. However, there is also a line of research which has shown that the age and sex of a potential interaction partner can also have an effect on how near or far an individual wishes to be from them. With regards to age, a study by Fry and Willis (1971) found that personal space invasions by children on adults resulted in age-dependent responses: five year-olds were received positively, eight year-old were ignored, whereas 10 year-old elicited negative responses, similar to those brought on by adult personal space invasions. With regards to sex, it has

been shown that people tend to seek closer proximity to men than they do to women (e.g., Willis, 1966).

'Race' is a further demographic variable shown to influence personal space in 'interpersonal' contexts. For example, Willis (1966) found white and black conversation partners sought marginally significantly more space from one another than did pairs of white or black conversation partners. In a more recent study, Goff, Steele, and Davies (2008) asked white participants to set up chairs for an anticipated discussion with either white or black conversation partners (who were in fact part of a cover story and not really due to arrive at the laboratory). It was found that when the discussion topic related to racial profiling – a racially sensitive topic – participants sought greater distance from their black partners than from their white partners. Leibman (1970, p. 220) explained the impact of 'interpersonal' demographics (such as race and sex) on proximity in the following way: "...it is normative in this society to prefer and feel more comfortable with those who are familiar, that is, "one's own kind"".

2.6.2 Evaluating the personal space approach to crowding

As has been shown, a wide array of factors can influence how much distance people seek from others. However, there are two major problems with a personal space approach to crowding. Firstly, at present, the link between personal space and crowding only accounts for when close proximity will, or will not, be experienced *negatively*. A person will respond negatively to close proximity if they feel that their personal space has been violated, but will remain neutral if they do not. Thus, there is no explanation as to why close proximity might sometimes be experienced *positively*.

The second problem relates to the proposed determinants of personal space that were discussed in the preceding section. While there is no reason to doubt that each of the variables *can* influence a person's proximity preferences to some extent, the problem is that they simply provide us with a long list of intervening variables, when what is actually needed is a psychological framework linking theoretically the different person and situation variables. As such, it becomes difficult to apply personal space to crowding.

To elaborate, let us briefly consider Altman and Vinsel's (1977) three categories in turn to highlight how each provides a limited explanation of personal space when applied to crowding.

First, as the individual factors describe relatively fixed personal characteristics, relying on them alone leaves little room for explaining intra-individual variations in personal space, and hence responses to crowding. If it is considered that young people require less space than old people, that masculine people seek greater distances than feminine people, and that Westerners prefer more space than Asians, it becomes difficult to explain why the young, masculine, Englishman discussed in section 2.5 might actively seek out and enjoy close proximity on a football terrace, while he might experience discomfort when crowded on a busy commuter train.

We could therefore try to explain this variability in terms of setting-environmental factors – e.g., the young, masculine, Englishman seeks out and enjoys close proximity on the terrace but not on the train because the terrace is outside and therefore provides vertical space, whereas the train carriage is indoors where vertical space is limited. However, again, such an approach falls short when trying to explain variable crowding behaviours within a particular setting – e.g., the crowded train carriage might cause anxiety and/or discomfort for the young man when travelling home from work, but might be the scene of great joy when he is surrounded by fellow supporters of his team when celebrating a victory following a football match.

The final category of variables said to influence personal space (interpersonal variables) also falls short when applied to intra-individual variability within a particular setting. Firstly, to assume that friends are comfortable with less space than strangers does not explain why people sometimes enjoy close proximity to strangers in crowds – e.g., in mosh-pits, stadiums, and at festivals. Secondly, if people seek out closer proximity to others simply based on fixed demographic similarities such as skin colour or sex, then all positively experienced crowds would be either single-sex or 'racially' homogenous. Obviously, this is not the case. A further problem with so-called interpersonal factors is that many of them describe interactions based on group-memberships (such as black vs white, old vs young, or male vs female), so while interactions in this category might be between two individuals,

and sometimes on an interpersonal level (e.g., when between two friends) they should be renamed as intra-group or inter-group interactions when they refer to group-level variables.

This brings us onto another problem with traditional personal space research. There has been some acknowledgement of group-level influences, such as culture, 'race', and gender, on personal space, and hence crowding variability. However, this consideration is somewhat underdeveloped. Group membership has been treated as an objective or demographic fact rather than a subjective or psychological self-definition that varies as a function of both perceiver and contextual variables. For example, consider Leibman's (1970) claim that people prefer closer proximity to 'their own kind'. This claim is based on the assumption that same sex, same 'race' others will always be seen as 'one's own kind', irrespective of contextual and perceiver variations. This is not always the case; a white, male office worker may see another man as his own kind in a context that compares men with women. He may see a white person as his own kind in a context that compares white people with black people. However, in a context that compares office workers with construction workers, it is likely that he will define a black, female office worker as more 'his own kind' than a white, male construction worker. The same principle applies to crowding. Imagine the same man travelling home from work on a packed train, surrounded by a demographically diverse group of strangers. There would be no contextually determined reason for him to think of the other passengers as 'his own kind'. However, if surrounded by the same demographically diverse group of strangers on the way home from a football match, and all of them were wearing the shirt of the man's favourite team, they would be united by their support for that team. It follows that the man might avoid close proximity, or experience unavoidable close proximity as unpleasant on the first train where there is no salient unifying group membership, but seek out and enjoy close proximity on the second train where he shares group membership with his fellow passengers. It therefore becomes clear that rather than seeing group membership as a demographic given, a *psychological* approach to group membership needs to ask the question of who we see as 'our own kind'.

In the following chapter, and for the remainder of this thesis, a theoretical approach to spatiality and crowding, which treats 'group' as a psychological

entity that varies as a function of an interaction between perceiver and contextual variables, will be developed. This framework will be based on the principles of self-categorization theory (SCT; Turner, 1982; Turner et al., 1987) – a well-established social psychological theory of group processes. A SCT approach to spatiality and crowding can account for the influence of contextual variables on group-level processes, and in doing so, provides a potential explanation as to why members of the ‘same’ social category (such as culture, ‘race’, or gender) should sometimes want closeness and sometimes want distance from each other, and why close proximity in crowds can be experienced positively in some situations but negatively in others.

Chapter 3: Theory development – the social identity approach and self-categorization theory

3.1 Introduction

So far, when considering theoretical approaches to crowding and spatiality, it has become apparent that many (but not all – e.g., Rosenthal & Mayer, 1983) of the psychological theories have focussed on individual perceivers. They have relegated the others co-present to the back of the scene, merely serving as amplifiers or irritants, a source of frustration or negative arousal. In doing so, they have overlooked the potentially dynamic relationship between the individual and other crowd members, and the psychological impact that group memberships and group relations might have on an individual's spatial preferences and hence their responses to crowding.

However, there are exceptions. As discussed, broad group classifications such as culture, 'race', age, and gender have all been shown to influence spatial preferences. Thus, some researchers have flirted with the idea of group-based norms and inter-group relations influencing spatial behaviours (and therefore psychological responses to crowding). However, this has been on a rather crude and underdeveloped level, which requires further attention. In particular, factors such as intra-group and intra-individual variations in spatiality need to be accounted for. Importantly, the proximity preference approach to crowding also needs to account for not only when close proximity will, or will not, be experienced negatively, but also when close proximity will give rise to positive psychological outcomes.²

In an attempt to address these theoretical gaps in the personal space and crowding literature, the current chapter will focus on developing a unified theory of spatiality and crowding. It will be argued that the key to understanding variations in our spatial preferences (and hence our varied responses to close proximity in both one-to-one interactions and in dense crowds) lies with an understanding of the flexible and context-dependant nature of the relationships between individuals and other crowd members, and how interpersonal, inter-

² Freedman's (1975) density-intensity approach does in fact account for positive responses to crowding, but was criticised for its inability to generalise to some situations of crowding (see Chapter 2, section 2.5).

group, and intra-group processes can determine the physical and psychological outcomes of human interaction. It will be argued that a certain conception of identity is needed to make sense of such variability in the content and form of the relations between a perceiver and others co-present.

First, a brief historical account of some of the research examining group processes will be presented. Following this, research and theory on inter-group behaviour (including inter-group conflict) will be reviewed, along with an overview of social identity theory. This will then lead onto an overview of self-categorization theory (SCT) – the social psychological theory that will be central to the hypotheses formulated and tested in this thesis. This overview will include a discussion of the applications of SCT (particularly with regards to phenomena previously discussed in individualistic terms, and also to crowd behaviours) followed by a statement relating to the theory's potential to explain spatial behaviours and variable psychological responses to crowding.

3.2 Understanding individuals and groups

Group processes have been at the centre of academic debate in social psychology for over a century. In his analysis of crowds (which can be seen as a special case of the group), Le Bon (1895/1968) suggested that crowd members lose their sense of self – their sense of *identity* – and then succumb to the unconscious, instinctive, and primitive collective characteristics of the 'collective mind', which are different to the characteristics of each of the crowd's individual members. According to Le Bon (1895/1965): "...among the special characteristics of the crowd there are several – such as impulsiveness, irritability, incapacity to reason, the absence of judgement and of the critical spirit, the exaggeration of the sentiments, and others besides..." (p. 56). Le Bon's analysis painted a picture in which crowd members are under the 'hypnotic effect' of the collective mind, where acts and thoughts spread through the group via the process of 'contagion' – a pathological and irrational spreading of any behaviours or sentiments.

On a conceptual level, Allport's (1924) individualist approach to group behaviour sits in direct contrast to that of Le Bon's 'group mind' theory. Allport (1924a) referred to the group mind approach as the "group fallacy" (p. 691), and claimed "...there is no psychology of groups which is not essentially and entirely

a psychology of individuals” (Allport, 1924b, p. 4). Allport’s (1924b) view of group psychology also applied to the psychology of crowds, of which he remarked: “...the individual in the crowd behaves just as he would behave alone only more so” (p. 295). Allport (1924b) proposed that through the process of social facilitation, the co-presence of others simply amplified an individual’s pre-existing tendencies, which were obtained through instinct and social learning. However, as noted by Reicher (2001), when it came to crowd action, Allport’s approach bore a striking resemblance to that of Le Bon. That is, according to Allport, when a crowd grows beyond a certain size, the crowd members’ learnt responses become less functional, and instead they revert to their instincts, which are destructive. Therefore, for both Le Bon and Allport, the crowd is characterised by a mass that has lost its identity, is devoid of its will, and is at the mercy of its instincts. Reicher (2001) noted another important similarity between these seemingly opposing perspectives. That is, they both ignored the potential for society and for contextual factors in general to shape the actions of people in groups and crowds (the problems associated with applying the theories of Le Bon and Allport to crowd behaviours will be revisited in more detail in section 3.5.1).

However, towards the middle of the twentieth century, a body of empirical work conducted in both laboratory and field settings began to offer new insights into the relationship between individuals and groups that went beyond the limitations of the ‘group mind’ and individualist approaches. In particular, the findings began to highlight the impact that contextual variables could have on group formation, and the impact that group formation could have on the behaviour of individuals within that group. Specifically, they demonstrated that intra-group and inter-group *interaction* played a vital role in the formation of intra-group norms and inter-group attitudes.

The idea that group behaviour can become meaningful following a period of interaction between group members (the interactionist approach) was highlighted in a series of laboratory studies. Most notable were those conducted by Sherif (1935, 1937) and Asch (1952, see also 1955).

Sherif’s (1935) work utilised a phenomenon known as the autokinetic effect. The autokinetic effect describes a situation whereby an isolated point of light is fixed at a distance from participants who are situated in a dark room.

Although the light is stationary, it appears to move. As there is no point of reference against which participants can judge the amount, or direction, of the movement, they tend to differ in their judgements of the light's 'movement' (Sherif, 1935). Thus, when individuals in Sherif's experiment were asked to judge the amount of 'movement' in repeated trials, they tended to report distances within a particular range, and these ranges were peculiar to each participant. However, Sherif (1935) noted that when those same people estimated the movement of the light in small groups (with each individual vocalising their judgement so that the whole group could hear), they tended to converge on a *norm* that was peculiar to that group. When participants then rated the movement alone in subsequent trials, their responses reflected the group norm that had been established previously. This finding was taken as evidence in support of the idea that in situations of uncertainty, group members can be used as a source of information when making judgements, and hence demonstrates the impact that group interaction can have on individual perceivers. In other words, the individuals were not behaving 'as they would alone, only more so', as suggested by Allport – they were acting in accordance to a group norm that was established during a period of group interaction.

In Asch's (1952) work, male participants attended an experimental session in groups that ranged from seven to nine people. Only one of the group members was a genuine participant – the rest were confederates. The groups were shown two cards. The first showed a single line whereas the second contained three lines of varying lengths – one being the same length as the line on the original card and the other two being obviously different. The groups were asked to state which of the lines on the second card was the same length as that displayed on the first. In the first two trials, each of the 'participants' stated the correct answer. However, in some of the subsequent trials, each of the confederates gave the wrong answer. Importantly, they each gave the *same* wrong answer. Asch was interested in how the actual participants would respond when the majority were clearly wrong, yet unanimous in their mistake. While participants differed in their reactions, with some always going against the majority and others going with the majority only some of the time, in total, participants agreed with the majority in 36.8% of the critical trials – i.e. when the confederates gave the wrong answer – even though they were clearly wrong.

The findings of Asch (1952) and Sherif (1935) provided important insights into intra-group processes. However, following the Second World War, researchers began to question the psychological processes underlying inter-group phenomena, such as prejudice, discrimination, hostility, conflict and genocide.

In a similar vein to Allport's (1924, 1962) individualistic approach to group phenomena, individualistic social psychological theories were explaining inter-group processes in terms of the individual attributes of those who acted on behalf of their group (Tajfel, 1978a). Thus, they represented a shift away from the interactionism of Asch and Sherif.

A good example is the theory of the authoritarian personality (Adorno, Frenkel-Brunswik, Levinson, & Sanford, 1950). Adorno et al. (1950) conducted psychometric testing on 2,000 participants who responded to scales designed to measure ethnocentrism, anti-Semitism, political and economic conservatism, and potentiality for fascism. A sample of participants who attained high and low scores on the ethnocentrism scale were also interviewed about their upbringing and family relations as well as their career aspirations. It was found that participants could be classified into a series of groups based on their responses to the measures, which reflected patterns in their thinking styles. The authors were most interested in the group containing respondents who scored high on all four of the measures, or in other words, those with an 'authoritarian personality'. Authoritarians were found to be submissive to authority, dogmatic, sexually repressed, more likely to see the world in terms of rigid categorisations, adherent to conventional middle-class attitudes, ethnocentric, and had the potential to express prejudiced views of minority out-groups, such as Jews. Adorno et al. (1950) drew on Freudian theory and attributed the development of the authoritarian personality to punitive child-rearing practices (which would lead to an unresolved conflict between the child and their authoritarian parents), and suggested that under particular social conditions authoritarians could potentially become fascists (see Roiser & Willig, 2002, for a review).

On the surface, the theory of the authoritarian personality provided a succinct and credible theory of inter-group conflict: people who are brought up in a psychologically harmful way can go on to develop a 'personality style' that would motivate them to endorse a set of values which included the derogation

of out-groups and adherence to the rules imposed by in-group authority figures. However, the reality was not so straightforward. For example, in a broad critique of individualism in social psychology, Tajfel (1978a) criticised the authoritarian personality when he noted that large proportions of national and religious groups have displayed extreme out-group hostility (e.g., genocide) even though all group members are unlikely to be authoritarians (or indeed to have uniformly received punitive upbringings). More recently, it has been demonstrated that individual personality measures (including measures of authoritarianism) did not significantly predict the level of inter-group discrimination displayed by participants who were asked to carry out an allocation task using the minimal group paradigm (Reynolds, Turner, Haslam, Ryan, Bizumic & Subasic, 2007; see the following section for an overview of the minimal group paradigm). This shows that inter-group discrimination is not simply reducible to individual personality differences – a finding that will be discussed in greater detail later in this chapter (see section 3.5.1).

Other individualistic theories of inter-group behaviour focussed their attention on unconscious processes (e.g. the frustration-aggression hypothesis; Berkowitz, 1989; Dollard, Doob, Miller, Mowrer, & Sears, 1939 - see Tajfel, 1978a for a critical review). Although these theories will not be reviewed in detail here, it is worthwhile to note that in focussing on unconscious processes, which are located within individuals, they too overlooked the historical context of inter-group relations, the meaning that group membership might have for an individual perceiver, and how it might shape their behaviour.

Whilst these theories framed inter-group hostility as an individual-level construct, a body of work began to highlight the importance of group-level process in the development of conflict between groups. For example, in their classic series of studies, Sherif, Harvey, White, Hood, and Sherif (1954/1961) designed an elaborate paradigm to test a series of research questions relating to intra-group and inter-group processes.

The first question was whether a group of previously unacquainted individuals would develop a hierarchical group structure after taking part in collective activities and sharing common goals. The second question was dependent upon the first being answered positively. That is, if groups were to form when individuals worked together for common goals, would two groups

formed in such away behave with hostility towards each other when faced with a situation of inter-group competition for resources which would result in success for one team and failure for the other team (leading to frustration due to being deprived from luxury items). They also questioned whether hostile attitudes held towards the out-group would become standardised within the in-group.

To address these questions, Sherif et al. (1954/1961) selected 24 boys to take part in a summer camp, called the Robbers Cave. The boys were matched for age (approximately twelve years old), socio-economic status (lower middle-class), religious background (Protestant), and other personal variables, such as educational achievement, and social adjustment (they were all well-adjusted insofar as they did not have a history of behavioural problems in school, at home, or in the neighbourhood).

The boys were split into two groups by the experimenters for phase one of the study. The groups were kept apart and were unaware of each other's presence. Both of the groups worked on several tasks (such as obtaining food, water or other necessary items), for which success depended on within-group co-operation. The researchers made extensive notes on the behaviours exhibited by each of the groups (see Sherif et al., 1954/1961). It was found that both of the groups formed into cohesive units. They gave themselves names (the Eagles and the Rattlers), they developed a hierarchical structure (with a clear leader, but less well-defined subordinate roles), and they developed their own group rules, group norms, and even adopted a group song. Group members who deviated from the standardised rules were either ignored by their fellow group members or challenged, sometimes through the use of mocking behaviour.

Towards the end of the first phase of the study, both of the groups became aware of the presence of the other group and displayed an eagerness to engage them in competition. The experimenters utilised this desire for competition to introduce the second phase of the experiment, in which the Eagles and Rattlers were pitted against each other in a multi-event competition, which lasted for five days. The events included tug-of-war, baseball, and a treasure hunt, whilst the prizes included a trophy and much-coveted pocket knives for the victors. The competition began in relatively good spirits, with the

winning teams in the early events applauding the losing side with three cheers and so on. However, as the competition progressed, inter-group behaviour became more hostile. For example, the groups verbally abused each other with insults and derogatory songs, while the Eagles burned the Rattler flag and the Rattlers raided the Eagles' cabin in retaliation. Eventually both groups refused to eat in the mess hall when the other group was present. When the boys were asked to rate their opposition, members of both groups tended to rate their opposition unfavourably (although there was not perfect uniformity in each of the individuals' negative attitudes and behaviours). This demonstrates that there was at least a trend for hostility in both the attitudes and behaviours of the in-group towards the out-group.

However, the third research questions of interest to Sherif et al. was whether a contextual shift could lead to a reduction of inter-group conflict. To address this question, the experimenters set up a range of tasks that involved brief interactions between the members of the two groups (the boys tried to resist this enforced interaction at first). The two groups were then faced with a series of problems, which they needed to work on collectively (as finding a solution would benefit both of the groups). In other words, they were faced with a series of superordinate goals (see also Sherif, 1958). These goals included fixing the water system so they could quench their thirst, or working together to pull a 'stalled' truck, which was carrying their food. Although at first the boys continued to act with hostility towards the out-group, signs of reconciliation soon became apparent. The boys recommenced eating at the same time, even mixing with the out-group at the dinner table. They also began to engage in light-hearted inter-group banter and play. To corroborate these observational findings, the boys were again asked to complete questionnaires designed to assess their attitudes towards the out-group. Whilst there was still considerable evidence of prejudice, it was found that ratings of the out-group became significantly more favourable than those obtained at the end of the second phase of the study, and hence demonstrates that the introduction of superordinate goals successfully reduced inter-group hostility to some extent.

The Robbers Cave experiment demonstrated that group behaviour is by no means the consequence of being at the mercy of the 'collective mind', as proposed by Le Bon, nor is it an exacerbation of individual properties, as argued

by Allport. Rather, it seems that individuals acted in accordance to group memberships. The group memberships were psychologically real and meaningful; norms, rules, flags and rituals defined the identities and shaped behaviour. It was also evident that the behaviours and attitudes held by each of the groups were influenced by the presence of a second group and the contextually determined nature of the interaction between the groups. In other words, intra-group and inter-group interaction, and the contextual backdrop to that interaction, shaped the behaviours exhibited, and the attitudes held by each of the groups.

The Robbers Cave studies led to the development of Realistic Conflict Theory (RCT; Sherif & Sherif, 1953; Sherif et al., 1961), which can be seen as a contrast to the individualistic theories of inter-group behaviour that were discussed above. Central to RCT was the hypothesis that competition for scarce resources (for example, the medals and prizes in the Robbers Cave study, or alternatively power, wealth or prestige in everyday examples of inter-group conflict) between opposing groups acts as a precursor to inter-group conflict. Thus, according to the theory, real situations of group conflict motivate people to identify with their in-group and work together against the out-group to attain a relevant, but scarce, resource. When opposing groups are then brought together to work for a goal, which requires between-group co-operation (a superordinate goal), conflict between the groups will be reduced (Sherif, 1958).

What becomes immediately clear is that RCT offered a refreshing alternative to the individualistic approaches. Group conflict was hypothesised in terms of real, contextually determined group relations as opposed to individual differences or human 'dispositions'. It demonstrated that anyone, as opposed to only those who received punitive upbringings, or experienced frustration, could express discriminatory behaviour in favour of an in-group over an out-group.

Although RCT provided an excellent starting point in the development of a *social* psychological theory of inter-group processes, a classic, and extremely influential series of studies conducted by Tajfel, Billig, Bundy, and Flament (1971) exposed its limitations and in part, led to the development of the social

identity approach to inter-group relations. This series of studies will be outlined in the following section.

3.3 The minimal group paradigm

Some of the studies described in the preceding section demonstrated the impact that group formation could have on the behaviours and perceptions of the individual perceivers within that group. Others demonstrated how group-formation can, under certain conditions, lead to inter-group conflict, and under other conditions, lead to inter-group reconciliation. However, one of the most important findings leading to the development of the social identity approach to inter-group relations emerged from the classic series of experiments carried out by Tajfel et al. (1971). Tajfel et al. were investigating the minimal conditions under which inter-group discrimination might occur. Male pupils from a state comprehensive school were randomly divided into categories based on trivial criteria such as their estimation of how many dots were in a series of rapidly presented patterns, or their aesthetic preference for artwork by the artists Klee or Kandinsky. Having been randomly assigned to one of these minimal categories, participants were given the opportunity to anonymously allocate money between two other participants. The other participants' personal identities were hidden – they were simply identified as participants who had been assigned to either the same or different minimal category as the participant allocating the rewards. Participants were informed that their monetary allocations would have no bearing on their own financial outcomes, as their own rewards would depend upon the allocation assigned to them by another (anonymous) participant. Thus, they had no *personal* stake in their allocations.

The emergent findings provided a powerful demonstration that the mere categorization of participants into novel and relatively unimportant groups was sufficient to create discriminatory behaviour in favour of the in-group. While there was evidence of a 'fairness' norm – a tendency to distribute rewards equally – the experimenters observed that participants also tended to award more money to an anonymous in-group member than they did to an anonymous out-group member. In addition, participants sacrificed the opportunity to maximise absolute profits for (a) fellow in-group members, and (b) all of the

participants taking part in the study, in favour of a *relative* financial victory by the in-group over the out-group. This led Tajfel et al. (1971) to conclude that relative advantage for the in-group over the out-group was more important to the participants than “simple [absolute] material gain for the ingroup” (p. 176). Importantly, the participants in Tajfel et al.’s experiments were acquainted prior to their participation in the study (as they were children from the same school). Thus, the opportunity to maximise reward for a group of people who were historically bound together by their attendance at the same school was overshadowed by the desire to reward anonymous others based on a novel and minimal group categorization (Tajfel et al., 1971).

These conclusions were strengthened when Allen and Wilder (1975) tested the belief similarity theory of discrimination (Rokeach, Smith, & Evans, 1960). Rokeach et al. (1960) had proposed that favouritism toward the in-group over the out-group resulted from the assumption that in-group members will hold similar beliefs to a person’s own beliefs, whereas out-group members’ beliefs will differ from their own. Allen and Wilder (1975) used a 2 x 2 design to manipulate (a) group membership (based on painting preference), and (b) similarity (based on an attitude questionnaire). An overall tendency to favour the in-group over the out-group was observed. However, while an increase in perceived in-group similarity led to more in-group bias than perceived in-group dissimilarity, there was not a significant effect of out-group similarity on reward allocations. Thus, group categorization rather than similarity had the greatest effect on the discriminatory behaviour.

While this study provided evidence against the belief similarity theory of discrimination, an alternative interpretation could be that the participants displayed in-group favouritism due to perceived similarity on the relevant performance domain (aesthetic preference) as opposed to the beliefs measured by the attitudinal scale.

However, Brewer and Silver (1978) explicitly told participants that the allocation to categories needed to be on a random basis due to *all* participants expressing similar preferences on the initial performance task. Participants again displayed inter-group discrimination in favour of the in-group. Therefore, the suggestion that participants may have allocated money to in-group members due to performance similarities on the relevant domains within the

procedure (dot estimations or aesthetic preference) had been eliminated, and further strengthened the suggestion that group categorization per se may be sufficient for inter-group discrimination to emerge.

The finding that inter-group discrimination emerged following the division of participants into minimal categories posed problems for RCT. As noted by Tajfel and Turner (1979), RCT made a laudable contribution to the theorising of inter-group processes by highlighting the contextual, realistic, and normative nature of group processes. However, they pointed out that the conflict in Sherif's studies was institutionalised (implemented by the camp authority figures), made explicit (and therefore a major part of the groups' everyday lives), and objective (insofar as one of the groups had to win whereas the other group had to lose). Each of these elements were absent from the minimal group studies, yet inter-group discrimination still occurred, indicating that institutionalised, explicit, and objective competition were sufficient, but not necessary conditions for inter-group discrimination (Tajfel & Turner, 1979).

3.4 Social identity theory

Although formally presented in 1979, the ideas central to social identity theory (SIT; Tajfel & Turner, 1979, 1986) were developed in a series of essays and papers that were written by Henri Tajfel and John Turner during the 1960s and 1970s (e.g., Tajfel, 1969, 1974, 1975; Turner, 1975). The theory was devised to explain the conditions underlying social change – i.e., how, when and why subordinate groups might resist oppression and seek to change the status quo. As a theory of inter-group processes, SIT could explain the minimal group findings in the absence of institutionalised, explicit and objective competition – each of which were present in the Robbers Cave studies. When developing SIT, Tajfel and Turner (1979) drew on one of the main observations implicit in Sherif et al.'s work on inter-group conflict: competition between groups for scarce resources can lead to *identification* with an in-group, which might in turn lead to discrimination against an out-group. Tajfel and Turner (1979) felt that RCT's failure to explain the psychological processes responsible for this apparent identification process (coupled with its inability to explain the minimal group findings) rendered it incomplete, and subsequently used it as a starting point for the development of SIT.

One of the fundamental propositions of SIT is that human social interaction operates on a continuum, ranging from interpersonal behaviour to inter-group behaviour. Interpersonal behaviour refers to the social interaction of individuals purely in terms of their individual selves, in a situation that is not influenced by their memberships of social categories. In contrast to this, inter-group behaviour relates to the social interaction of individuals based purely on their memberships of various social categories, in a situation in which inter-individual relationships have no bearing on the interaction.

Tajfel and Turner (1979) acknowledged that examples of behaviours at either extreme are rare (although they used soldiers on opposing sides during a battle as an example of behaviour nearing the inter-group extreme, and the relationship between husband and wife as an example nearing the interpersonal end of the continuum). However, they stated that movement along the continuum *towards* either extreme would determine whether a social interaction would be conducted at an interpersonal or inter-group level.

According to SIT, when group formation occurs, members of a given group (or social category) will act in accordance to a social identity, which can be defined as an individual's "knowledge that he belongs to certain social groups together with some emotional and value significance to him of his membership" (Tajfel, 1974, p. 72). People will have a desire to see the groups with which they identify in a positive light, and one way of doing so is to compare their own groups with out-groups who can act as a point of reference. If a person is not satisfied with a particular social identity, they will either try to leave the group, or if unable or unwilling to do so, they will attempt to differentiate their own groups from relevant out-groups in a way that maintains or establishes positive distinctiveness.

A second fundamental aspect of SIT relates to how people perceive the social structure of the society in which they live, and more specifically, the relationship between social groups within their society. Tajfel and Turner (1979) introduced a second continuum anchored by a social mobility belief system at one end and a social change belief system at the other. The social mobility system refers to an individual's belief that there is scope for them to change between social groups within society. In other words, they perceive group boundaries to be permeable and believe that through a variety of means (which can include

effort, ability, money etc.), they will be able to gain social mobility. The contrasting belief system – that of social change – refers to the idea that people perceive society as rigidly stratified, and therefore established in a way that makes it impossible (or at least extremely difficult) to move (as an individual) from a group that causes them dissatisfaction. This could be due to social constraints (e.g., in a caste system), legal constraints, or personal constraints (e.g., not wishing to be perceived as a ‘traitor’). According to Tajfel and Turner (1979), “The major characteristic of social behaviour related to this belief system is that, in the *relevant* intergroup situations, individuals will not interact as individuals, on the basis of their individual characteristics or interpersonal relationships, but as members of their groups standing in certain defined relationships to members of other groups” (p. 35, emphasis in original). Therefore, when people hold social change beliefs and are dissatisfied with an element of their standing in society, they will work as a group to alter the status quo rather than move as individuals to alter their own individual status.

In the original formulation of SIT, Tajfel and Turner (1979) highlighted three variables which would determine whether individuals will strive for positive distinctiveness for their group. First, they must perceive their group membership as being part of their self-concept. Second, the dimension of comparison should match the comparative context. And third, the comparison group should be seen to be relevant (where relevance is in part determined by similarity, proximity, and situational salience).

When these conditions are satisfied and when group relations are operating towards the end of the continuum anchored by social change beliefs, positive distinctiveness can be maintained or achieved via a variety of group-level methods. The method employed will depend on the perceived status of an in-group (high or low) and the relationships between the in-group and relevant out-groups, which can be secure (legitimate or stable) or insecure (illegitimate or unstable). One such method is through the use of social creativity, which can be broken down further into three parts. First, people may change the dimension for comparison to one that is more favourable to the in-group. Second, the meaning of values assigned to a particular group can be altered to show that group in a more positive light. And third, a different group can be used as a frame of reference. An alternative method used for countering a

negative social identity, or maintaining a positive social identity, is engaging in social competition in an attempt to change the status quo. It is hypothesised that this strategy will be employed when the relations between groups are perceived to be insecure and therefore susceptible to change following direct competition. When the social mobility belief system is operating, members of both high and low status groups who are experiencing threats to their social identity can attain positive social identity by moving to a new group when group boundaries are perceived to be permeable. This method of achieving positive distinctiveness is referred to as individual mobility (Tajfel & Turner, 1979).

An important implication of these aspects of SIT is that social interaction is contextually determined. Firstly, contextual factors such as the presence (or absence) of a particular social identity at a particular time, will determine where on the inter-personal - inter-group continuum a person, or group of people will see themselves and others, which will in turn influence the nature of their interaction. Secondly, societal structures (which are subject to change) and an individual's beliefs about those structures (which are also subject to change) will influence how people see the world around them, and subsequently how they will define and interact with other people; namely, whether those interactions will be on an interpersonal or inter-group level. The implications of these continua do not end here. According to SIT, when actions are near the social change and inter-group poles of the continua, uniformity in group members' actions towards an out-group will increase, while out-group members will be perceived and treated "as undifferentiated items in a unified social category, rather than in terms of their individual characteristics" (Tajfel & Turner, 1979, p. 36). However, as interactions move towards the social mobility and interpersonal poles, the out-group will be perceived as heterogeneous, and therefore actions towards them will become more varied.

A theoretical framework has now been provided which allows a basic understanding of inter-individual and group-based human interaction. Although the above discussion of SIT is relatively brief, it is clear that the theory provided a framework from which to understand the minimal group findings. For participants in Tajfel et al.'s (1971) studies, the only way of attaining positive distinctiveness was to discriminate on behalf of one's group on the only available dimension for comparison: the monetary rewards allocated to either

group. Therefore, it makes theoretical sense that rather than maximising gains for their own group, participants allocated money in a way that ensured a maximum *relative* advantage for their own group over the out-group.

The basic theoretical underpinnings of SIT have now been presented and applied to the minimal group findings, and an explanation of the wider implications of the theory have also been made clear (for a real-world application of SIT see Brown, Condor, Mathews, Wade, & Williams, 1986; or for a review of applications to organisations, see Haslam, 2004). Before drawing the current discussion of SIT to a close, it is important to make clear that the theory in no way states that in-group bias is an inevitable, nor automatic, cognitive response to group membership (Haslam, 2004; Hornsey, 2008; Turner, 1999). Contextual features, such as those outlined above (e.g., the comparative relevance of the out-group and the dimension for comparison, as well as perceived legitimacy of status hierarchies) and the contextually defined pre-existing relationship between various social categories, will help to determine the existence, nature, and extent of discrimination between groups.

3.5 Self-categorization theory

SIT provided a theoretical framework for explaining *inter-group* phenomena and a preliminary explanation of the processes underlying behaviour at the interpersonal and inter-group extremes of interaction. However, the theory did not offer an elaboration of the socio-cognitive processes underpinning the shift along the interpersonal-inter-group continuum, nor did it provide a detailed analysis of behaviour within a social category, or in other words, *intra-group* behaviour. As a result, questions remained unanswered regarding how, when, and why a person might actually come to define themselves in terms of a particular social group (rather than as individuals). As a result, John Turner – one of the original authors of SIT – along with his colleagues, devised self-categorization theory (SCT; Turner et al., 1987; Turner, Oakes, Haslam, & McGarty, 1994).

While closely linked, and often subsumed under the umbrella heading of the social identity approach, SCT and SIT are separate theories, although complementary (Turner et al., 1987). According to SCT, self-categorizations are cognitive representations which are based on intra-class similarities and

inter-class differences. People can either self-categorize according to their own distinct personal identity, or according to any one of a number of social identities, which are shared with other people who can be either real or imagined, absent or present. Thus, personal identity is based on a person's individual qualities and their differences from other individuals, whereas social identity is based on similarities with other in-group members and differences from members of other categories.

While SIT viewed interpersonal and inter-group interaction as polar opposites, SCT suggests that self-categorizations are structured hierarchically. At the top of the hierarchy is the class that is all-inclusive – that is, all human beings – which is also known as the superordinate level of abstraction. At this level of identification, which can be referred to as human identity, similarities between humans and their differences (as a group) from alternative species will dominate the cognitive aspect of the self-concept. The next level down the hierarchy is the intermediate level, which is also known as social identity. At the intermediate level, the similarities between people within social groups (of which there are a potentially infinite number), and their differences from people belonging to other social groups are important for a person's cognitive representation of self. Finally, the subordinate level of abstraction, which sits at the bottom of the hierarchy, refers to personal identity. At this level, differences between an individual (in terms of a wide range of personal qualities) and other in-group individuals are at the forefront of a person's self-definition. Like SIT, SCT views the salience of social identity and personal identity as operating on a continuum. SCT predicts that more than one level of identity, and more than one category, can be salient at any one time, which contrasts with the bipolar structure outlined in SIT. However, despite this concept of a multi-layered self, SCT predicts that one identity (i.e., level and content) will usually prevail. As pointed out by Turner et al. (1987), the hierarchy refers only to levels of inclusiveness (from all humans down to the individual alone), rather than being representative of categories in order of importance with regards to 'true' reflections of self.

The basic structure of self-categorisation, according to SCT, has now been described. However, it is still not clear how people actually come to categorize themselves in terms of a particular identity, be it social or personal. Based on

the ideas of Bruner (1957) and Rosch (1978), SCT proposes several interacting processes underlying categorisation. The first of these is the perceiver's *readiness* to categorise according to a particular identity. Readiness depends on the perceiver's past experiences and personal values, as well as their goals, motives, and needs within a particular context (Turner et al., 1994). The perceiver is therefore active rather than passive when self-categorising.

SCT proposes that categorization relies on an interaction between the processes of perceiver readiness and the extent to which a particular category 'fits' in a particular context. Fit can be broken down further into two parts. The first part is termed comparative fit and encompasses the metacontrast principle, which was central to SCT in its early formulation. The metacontrast principle refers to the ratio of intra-group differences to inter-group differences. When an aggregate of stimuli (in this case people) are evaluated by a perceiver, they will be classified as a group (or an entity), when the average differences between people within the aggregate are perceived to be less than the average differences between that aggregate and an alternative aggregate which is being used as a frame of reference (Turner, 1999; Turner et al., 1987; Turner et al., 1994). 'Difference' will be assessed on a contextually relevant domain. An important implication of the metacontrast principle is that groups or entities are highly dynamic and depend on a combination of situational variables and a perceiver's subjective interpretation of those variables. Who is included in a perceiver's in-group/s, or whether the perceiver believes a group is present at all, will depend on the comparisons they make and the culturally available frames of reference.

The second aspect of fit is called normative fit. This refers to the reality of a situation matching a perceiver's normative expectations of a social category. In other words, a person, or a group of people, are more likely to be categorized as a group when their features (such as their behaviour, appearance or attitudes) are congruent with the perceiver's expectations of that particular group. For example, men displaying behaviours that are understood within a culture to be normative of men (in contrast to women) are more likely to be categorized as men, than those who are displaying behaviours that are incongruent with cultural understanding of 'manliness'.

A large body of research has supported the idea of normative fit impacting upon categorizations (e.g., Oakes, Turner, & Haslam, 1991; Turner et al. 1987). In one such example, Blanz and Aufderheide (1999) presented participants with statements that were supposedly made by either a psychology student or a medical student. The statements related to attitudes towards alternative medicine. Pre-testing showed that people expected psychology students to be relatively pro-alternative medicine, and medical students to be relatively anti-alternative medicine. Therefore, participants were presented with a statement that was either normative (psychology student pro-alternative medicine/medical student anti-alternative medicine) or counter-normative (psychology student anti-alternative medicine/medical student pro-alternative medicine). Participants were then asked to rate whether the participants' opinions were due to their individual personalities or whether they were due to the subject that they studied. For both psychology students and medical students, participants attributed the views to individual differences when they were counter-normative, whereas they attributed their views to their social category membership when they were normative of that social category. This demonstrated that even when the possibility to consider behaviour in terms of a social category is present, people are reluctant to do so unless the behaviour fits in with their own beliefs about how a member of a particular group *should* be behaving.

According to SCT, when the processes of perceiver readiness and category fit make a social identity salient to a perceiver, their self-concept will become depersonalized. In other words, the perceiver will define themselves in terms of a social identity ('we' and 'us') as opposed to their personal identity ('I' and 'me') (Turner, 1999). Depersonalization is central to SCT as it underlies group behaviour. It is argued that when depersonalized, people will self-stereotype according to a prototypical view of both the in-group and out-group. For example, in a study conducted by Onorato and Turner (2004), male and female participants were evaluated to assess the extent to which they thought of themselves as dependant or independent (or in other words, whether they possessed a dependant or independent self-schema, as defined by Markus, 1977). According to the authors, dependence is thought of as a typically female trait whereas independence is thought to be a typically male trait. It was found that making the male identity salient to men and the female identity salient to

women led participants to rate themselves in a way that was congruent with the stereotypical view of their gender, even if this view contradicted the participants' personal self-schemas. To elaborate, male participants with a dependant self-schema when their personal identity was salient rated themselves as independent when their male identity was salient, and vice versa for female participants. Thus, depersonalization led participants to endorse contrasting views of the self, which were context dependent.

Turner (1999) elaborated on the implications of the depersonalization process in the following quote: "At certain times the subjective self is defined and experienced as identical, equivalent, similar to or interchangeable with a social class of people in contrast to some other class. Psychologically, *the social collectivity becomes self*" (p. 12, emphasis added). The importance of the above quote should not be understated as Turner et al. (1994, p. 456) have also suggested that the "metaccontrast principle is explicit that categorising is inherently comparative and hence is intrinsically variable, fluid, and relative to the frame of reference. It is always context dependent". Therefore, the distinction between who is 'self' and who is 'other' is also contextually determined and subject to change.

To use an anecdotal example, consider a group of football fans watching a televised match in a pub. If the collective consists of fans of rival teams from the English Premier league who are playing against each other, self-categorization processes might lead the individual perceivers to consider supporters of their own team to be 'one of us' and hence a part of 'self', whereas supporters of the of the rival team will become 'other'. These disparate social identities – let's say they are Tottenham Hotspur supporters and Arsenal supporters – will be made salient by contextual factors such as the colours worn and chants being vocalised (normative fit). As a result, Tottenham fans might think of themselves in terms of their historically and contextually determined similarities to other Tottenham fans and their differences from Arsenal fans, whilst the Arsenal fans will think of themselves in terms of their similarities to fellow supporters of their team and their differences from the opposition. However, a simple shift in context can lead to an important change. If the same group of people had gathered to watch England play an international match, a more inclusive social identity (that of England fan) might

become salient. That is, the England shirts and chants in the context of a match against another national team will lead all of the fans to think of themselves in terms of their similarities to other England fans and their differences from supporters of other national teams. As a result, those people who had previously been thought of as 'other' will now become a part of 'self'.

Now that the basic principles of self-categorization theory have been discussed, a clearer picture of the processes underlying group behaviour has emerged. A combination of a perceiver's attributes, contextual features, and the attributes of others present determine whether a person will self-categorize according to a personal identity or any one of a potentially infinite number of social identities. Consequently, who is seen as self or other can be highly variable.

3.5.1 Applications of SCT: Group and 'individual' phenomena

The development of SCT has served as the catalyst to a vast and diverse body of related research. It has been used to explain a range of group processes, including group cohesiveness (e.g., Turner et al., 1987; see Hogg, 1993, for a review), group commitment (Ellemers, Spears, & Doosje, 1997, 1999), minority and majority influence (e.g., David & Turner, 2001), and group polarization (e.g., Hogg, Turner, & Davidson, 1990). However, the theory has also been applied to diverse areas in which group-level processes were not widely implicated previously. These include: pro-social behaviour (Levine, Prosser, Evans, & Reicher, 2005; Stürmer, Snyder, & Omoto, 2005), coping with stress (Haslam, O'Brien, Jetten, Vormedal, & Penna, 2005; Haslam, Jetten, O'Brien, & Jacobs, 2004; Haslam & Reicher, 2006), the perceived severity of the hypothetical symptoms of illness (Levine and Reicher, 1996; Levine, 1999) and the symptoms of people who were actually ill (St. Claire, Clift, & Dumbelton, 2008).

The 'personality' domain provides another example of SCT being applied to an area of social psychology that was previously dominated by individualistic theorising. For example, trait theorists describe personality as universally reducible to a number of factors (clusters of traits) and provide a framework from which to examine the extent to which *individuals* differ on each of these factors (e.g. Costa & McCrea, 1992). Likewise, theories of the prejudiced personality have tended to take an individualistic stance and also suggest that

prejudice is an expression of a stable personality trait. One example of this is the authoritarian personality (Adorno et al., 1950), which was outlined earlier in this chapter. More recent theoretical approaches to the prejudiced personality include right-wing authoritarianism (RWA: Altemeyer, 1996) and social dominance orientation (SDO: e.g., Pratto, Sidanius, Stallworth, & Malle, 1994). RWA focuses on the covariation of three attitudinal clusters: authoritarian submission, authoritarian aggression, and conventionalism, whereas SDO discusses the level of acceptance of inequality between social groups. Like Adorno et al. (1950), Altemeyer (1996) claimed that a prejudiced personality stems from childhood experiences, whilst Pratto et al. (1994) attributed SDO to an evolved, predisposed, biological drive to form hierarchical social systems.

By suggesting that unconscious, socialised, or biological factors underlie personality, it is implied that it is largely resistant to change. This view has been challenged by theorists such as Mischel (2004), who has claimed that a person's cognitive representation of their self in a particular context will determine their behaviour in that context (which accounts for variable expressions of personality, but still implies context dependant consistency). However, Mischel's focus remained firmly on the individual perceiver, and largely ignored the role of group-level processes.

This focus on the individual creates a problem for theories of prejudice – especially the prejudiced personality. Prejudice involves negative feelings towards a person or group of people based on their membership of certain groups, which can in turn lead to discriminatory behaviour against those people. It is therefore very much a *group*-based phenomenon, which is sometimes explained in terms of *individual* personality traits. Reynolds, Turner, Haslam, and Ryan (2001) examined the relationship between authoritarianism and prejudice in a variety of contexts. Participants were asked to complete measures of RWA and prejudice (in the form the Modern Racism Scale, MRS: McConahay, Hardee, & Batts, 1981) in one of five conditions: a control condition (no identity specifically made salient), when self categorized according to their personal identity, or when self-categorized according to one of three social identities (nationality, gender, or age). They found that the level of self-categorization salient to the participants when completing the measures affected the subsequent relationship between authoritarianism and prejudice.

To elaborate, while there was a significant positive correlation between RWA and prejudice in the control condition, and when the participants' gender and age were salient, the correlation was far weaker when personal identity was salient, and non-existent when their national (Australian) identity was salient. These findings clearly demonstrate the influence that group-based, context-specific ideologies can exert over the relationship between RWA and prejudice. This in turn poses serious problems for theorists who view the prejudice as an individual's 'fixed' personality.

Turner, Reynolds, Haslam and Veenstra (2006) have suggested that SCT provides the theoretical framework from which to understand these group-based variations in the relationship between RWA and prejudice, and indeed the prejudiced personality more generally. Central to this is the idea that when depersonalized, people are guided by their membership to particular social categories and their interchangeability with other group members rather than by their own idiosyncratic motives. Their understanding of what it means to be English or Australian will vary depending on their existing theories of what each identity means, and also with whom they are comparing themselves against. In other words, the finding that RWA was not correlated with prejudice when participants' Australian identity was salient can be attributed to the fact that participants were asked to consider Australians in contrast to Americans. The social norm of Australians being less prejudiced than Americans then minimised the relationship between RWA and prejudice (Reynolds et al., 2001).

To do justice to the entire range of applications of SCT would be impossible within the scope of this discussion. Therefore, a high degree of selectivity has been required. The reason for revisiting and focussing on the prejudiced personality was twofold. First, it provided an opportunity to highlight the powerful challenge that the inception of SCT brought to mainstream social psychological thought and the subsequent impact that it has had on our understanding. Second, it is felt that demonstrating the value of applying a theory which describes social perception in terms of a depersonalized self to an area previously discussed in terms of individuals' idiosyncrasies, will highlight the potential value of applying that same theoretical framework to spatial and crowding behaviours.

3.5.2 Applying SCT to crowd behaviour

While the current body of work will attempt to bring a self-categorization perspective to crowding and spatial phenomena, the application of SCT to crowd behaviour is by no means novel. A series of laboratory and field studies spanning more than 25 years have applied social identity principles to many crowd-related behaviours, some of which will be discussed in the following section.

As already discussed in this chapter, many of the early group theories used the crowd as a special case of group behaviour (e.g., Allport, 1924; Le Bon, 1895/1968). These theoretical approaches to crowd psychology have been heavily criticised. For example, both Le Bon's 'group mind' approach and Allport's individualistic approach have been critiqued for divorcing instances of crowd behaviour from the social context in which they are observed (see Reicher, 2001). Reicher (2001) criticised these approaches further for their implication that people in crowds experience a form of identity loss, and ultimately become generically destructive.

While both approaches could be dismissed as a product of their time, their impact – particularly that of Le Bon – should not be understated. Take the concept of deindividuation (first described by Festinger, Pepitone, & Newcombe, 1952) as an example. Not to be mistaken for depersonalization (the shift from personal identity to a social identity that is central to SCT), deindividuation refers to a situation whereby being immersed in a group or crowd leads to anonymity, which in turn lowers self-awareness and hence, behavioural control. In turn, crowd members feel unconstrained by social norms (such as order and restraint) and instead act 'anti-normatively'. In other words, they become more destructive. For example, in a series of studies conducted by Zimbardo (1969), participants were more likely to administer 'electric shocks' to a confederate for longer when they were 'deindividuated' (asked to wear lab coats and hoods) as opposed to when their identity was visible to the others co-present (they wore normal clothes and a name badge). There have been three elaborations of deindividuation theory following Festinger et al.'s original formulation (e.g., Diener, 1980; Prentice-Dunn & Rogers, 1989; Zimbardo, 1969). However, Reicher (2001) has observed that each of these elaborations share common themes – i.e., they all state that (1)

only personal identity underpins rational behaviour, (2) the loss of personal identity (and the standards of rationality that come with it) will therefore inevitably lead to uncontrolled behaviour, and (3) that being in a large group or crowd will lead to deindividuation (the loss of personal identity), and hence facilitate destructiveness. Thus, almost 100 years after first coming to light, Le Bon's ideas were still being perpetuated by social psychologists at the forefront of group and crowd theory.

A laboratory study by Johnson and Downing (1979) challenged the idea that the loss of individuality, and the anonymity of action, served as precursors to destructive, anti-social behaviour. In a 2 x 2 design, participants were led to believe that they were taking part in an experiment in groups of four people. They were dressed either in 'anti-social' costumes (baggy overalls and masks, which were reminiscent of the costume worn by the Ku Klux Klan, and also the costumes used by Zimbardo, 1969), or in 'pro-social' costumes (nurses' uniforms), and presented with a task in which they were required to administer 'electric shocks' to another person when that person failed to provide the correct answer during a learning task. Participants were allowed to choose the level of shock that the other person received. In the 'individuation' condition, participants believed that the amount of shock, and who was administering it, was visible to all other participants, whereas in the 'deindividuation' condition, the level of shock, and who was administering it was completely anonymous. The findings raised serious questions for 'deindividuation' theory. Firstly, participants dressed in the Ku Klux Klan-like costume administered higher levels of shock than those dressed as nurses. Secondly, 'deindividuated' participants did not simply administer higher levels of shock than those who were 'individuated'. Rather, an interaction between the type of costume worn, and whether the action was anonymous, was observed. 'Deindividuation' led to more anti-social behaviour when participants were dressed in the anti-social costume, but led to more pro-social behaviour (i.e., reduced electric shocks, below the baseline) when they were dressed in the pro-social costume. This suggests that participants acted according to social cues associated with each of the costumes, rather than as an effect of being 'deindividuated'.

Johnson and Downing's (1979) study provided one example of group-level social cues influencing behaviour when individuals are 'deindividuated'. A

further example can be found in the first laboratory study designed to test social identity principles using a deindividuation paradigm (Reicher, 1984a). Reicher (1984a) recruited science and social science students for the study, which used a 2 x 2 x 2 design. The participants were told that the study was investigating attitude-behaviour consistency and that they were either being assessed as a group or as individuals. For participants in the group conditions, the room was arranged so that science students sat together at one table, whereas social science students sat together at another table. For participants in the individual condition, the chairs were arranged in rows and science and social science students were intermingled. Participants took part in the study either in their normal clothes (identifiable) or in baggy overalls and masks (anonymous). The participants in the group-anonymous condition wore coloured masks (red for one group, white for the other), whilst all those in the individual-anonymous condition wore white masks. The participants watched a video of scientists and social scientists presenting arguments about vivisection, with members of each group consistently presenting normative arguments (scientists were consistently pro-vivisection and social scientists consistently anti-vivisection). It was predicted that group boundaries would be clearest for participants who were in the anonymous-group condition and so their social identity would be most salient. Furthermore, it was predicted that due to the increased identity salience for participants in this condition, they would be most likely to express opinions and behaviours consistent with their own group's norms in a subsequent task.

A clear effect of group on attitudes emerged. Science students who took part in the group condition were more likely to express pro-vivisection attitudes than those in the individual condition, whereas social science students were more likely to express anti-vivisection attitudes when they were in a group of social scientists as opposed to intermingled with scientists and social scientists. The effect of anonymity was less clear, but still lent support to a social identity explanation of so-called deindividuation effects. To elaborate, the interaction between anonymity and immersion in a group was not significant for social science students. However, for science students, whilst there was not a significant difference in attitudes towards vivisection for participants in the group and individual (intermingled) condition when they wore their own clothes, participants in the group condition expressed stronger pro-vivisection attitudes

than did those in the individual condition when participants were anonymous. Therefore, anonymity coupled with a clear physical distinction between the in-group and the out-group enhanced social identity salience and led to stronger endorsement of attitudes that were consistent with in-group norms.

Further criticism of 'deindividuation' theory came from Postmes and Spears (1998) who conducted a meta-analysis of 60 studies to establish whether being anonymous, lacking self-awareness, and being in large groups (i.e., 'deindividuation') leads people to display anti-normative behaviour (usually administering electric shocks). Their results suggest that in contrast to this, and in line with Johnson and Downing (1979) and Reicher (1984a), experimental manipulations of 'deindividuation' led to displays of *normative* behaviour. Of greater importance, perhaps, was the finding that these 'deindividuated' behaviours were not consistent with general social norms – the type that might govern the behaviour of individuals within a society in general – rather, they were consistent with the norms that were associated with a particular group within each study (such as the norm for caring that would be associated with nurses). This finding was interpreted as evidence in support of the social identity model of deindividuation effects (SIDE; e.g., Reicher, Spears, & Postmes, 1995).

According to the model, while immersion in a large group can take a perceiver's focus away from their individual self, this does not represent a loss of identity – rather, it underlies the shift from a personal identity to a social identity. That is, it facilitates the *depersonalization* process. As a result, people act in terms of the norms associated with a salient social identity rather than in an anti-normative fashion.

It could be argued, however, that while experimental studies (such as those meta-analysed by Postmes and Spears, 1998) allow for control over the critical independent variables (i.e., the group identity and anonymity), their potential weakness lies with their lack of external validity. People act in terms of the norms associated with a particular social group in the controlled laboratory environment, but what of their behaviour in actual crowd events – the type that were discussed by Le Bon? Research conducted at various crowd events has lent further support to the idea that crowds should sometimes be seen as

meaningful reflections of society as opposed to displays of destructive irrationality.

Reicher (2001) points to Thompson's (1971) analysis of the 18th century food riots in England as the classic example of this. Despite being faced with starvation, 'rioters' did not simply seize grain when supply was at its lowest. Instead, the 'riots' took place when grain supplies were increasing and the produce was being transported away from the local area to distant marketplaces (to be sold for maximum profit). Thus, the behaviour of the crowds represented a conflict between the local people's perception of what was moral (to meet the needs of those in the locality) and the principles dictated by the emergent free market system whereby goods were transported to location where they could be sold for maximum profit. Rather than simply taking the grain for personal consumption, the 'rioters' sold it locally at reasonable prices and then handed the money back to the corn merchants – thus displaying a high degree of rationality, selectivity and fairness in their behaviour. This rational behaviour in times of desperation demonstrates that collective ideologies can shape crowd behaviour and is far removed from the irrational, primitive and destructive actions of the crowd described by Le Bon, Allport, and deindividuation theorists.

Consistent with the SIDE model, Reicher developed the social identity model (SIM) of crowd behaviour (e.g., Reicher, 1984b, 1987). As SCT theorists make the distinction between a simple group and a psychological group, the SIM approach to crowds makes the distinction between a physical crowd and a psychological crowd. While a physical crowd is a chance aggregate of individuals (e.g., commuters travelling to work on a train), a psychological crowd is meaningful for its members. When describing the psychological group, Turner (1987, p.1) stated that:

...a psychological group is defined as one that is psychologically significant for the members, to which they relate themselves subjectively for social comparison and the acquisition of norms and values...

In the usual terminology, it is a (positive) *reference* group and not merely a *membership* group as defined by outsiders, i.e., it is not simply a group

which one is objectively *in*, but one which is subjectively important in determining one's actions.

The same principle applies to the psychological *crowd*. Therefore, based on the core hypotheses of SCT, it is suggested that in a psychological crowd, the processes of perceiver readiness and contextual fit lead crowd members to become depersonalized – that is, to self-stereotype in terms of a salient social identity – which then serves to shape the actions of the crowd. In other words, crowd action is the rational expression of a social identity, rather than an irrational consequence of individual identity loss.

The first study to test the SIM in a field setting was Reicher's (1984b, 1987) analysis of the St Pauls 'riot', which took place in 1980 following a police raid on a café in Bristol. Reicher's data-set included the official police report of the incident, legal documents, a series of media reports, photographs of the incident, interviews, and notes from conversations with St Pauls residents who were approached on the street. Reicher noted that rather than experiencing a form of identity loss, participants in the 'riot' described themselves in terms of a collective identity (St Pauls residents), and that their behaviour was consistent with that identity. For example, only those who shared the identity became involved in the 'riot', and the people who were seen to best represent the group identity (namely, older Rastafarians) were the most influential. In addition, the 'riot' remained within the geographical boundaries of St. Pauls, and the targets of the crowd violence were highly selective. For example, it was noted that the residents of St Pauls shared the collective understanding that as a group, they were positioned in opposition to the police, and the fact that most of the violent acts were against the police (both personnel and vehicles) was consistent with this shared understanding of group relations. Thus, violent acts were not indiscriminate expressions of a loss of identity, or loss of control, but targeted, meaningful expressions of a social identity.

By introducing social identity principles to crowd behaviour, the SIM offered a refreshing alternative to the 'irrationalist' approaches to crowd behaviour. However, the model was not without its limitations. For example, although the SIM could use social identity processes to account for the limits of crowd behaviour, it failed to explain the dynamic inter-group processes

underlying the escalation of crowd 'disorder', or the ways in which such processes could lead to psychological change within the crowd – i.e., how or why a peaceful crowd might turn violent.

The elaborated social identity model (ESIM; Reicher, 1996; Drury & Reicher, 2000, 2005; Stott & Drury, 2000; Stott & Reicher, 1998a, 1998b) of crowd dynamics was developed specifically to account for these deficiencies in the SIM. The ESIM describes this escalation of violence and psychological change in terms of several processes. For example, analyses of crowd events such as football 'disorder' (e.g., Stott & Reicher, 1998a) and the 'poll tax riot', which took place in London in 1990 (Stott & Drury, 2000; Stott & Reicher, 1998b), revealed the impact that inter-group dynamics can have on crowd members' perceptions and behaviours during collective action. For example, a great deal of heterogeneity was observed amongst those in the crowds – whilst a minority of crowd members were intent on conflict and violence, the majority thought of themselves as 'moderates'. However, when the police took indiscriminate, and what the crowd perceived to be *illegitimate* action against the crowd due to their perception of them as a homogenous group, there was an identity shift amongst the crowd members; those who previously self-defined as moderates became radicalised and joined the minority in their opposition to the police. Thus, the ESIM suggests that if an out-group, such as the police, imposes a common fate on a crowd (e.g., football supporters or protesters) – this will lead to a self-fulfilling prophecy in which a previously heterogeneous crowd becomes homogenised following a shift in identity and self-perception. According to Drury and Reicher (2005): "...those within the crowd who advocate confrontation will no longer be seen as 'other'" (p. 37). Instead, they will be seen as interchangeable with self – as members of a single, unified social category. As a result of this shift from separate identities to a new inclusive social identity, crowd members can experience a feeling of empowerment. Their greater numbers and their newfound feelings of consensus and mutual support can empower the crowd to unite against the out-group. Thus, the ESIM provides an explanation of the way in which the actions of an out-group can impact upon (a) the way people see themselves, (b) who they define as a part of self, and (c) the types of action that they perceive to be appropriate and achievable.

This is not the place for an in-depth discussion of the applicability of SCT to crowd behaviour (see Reicher, 2001 for a detailed discussion). However, this summary provides an insight into the ways in which SCT has enhanced our understanding of crowds. It allows for an analysis of crowd behaviour, not as something irrational or pathological, not as a physical condition that precludes a loss of identity, but as phenomena which can, under certain circumstances, facilitate a shift from a personal identity to a relevant social identity. SCT accounts for the ways in which socially shared meanings can shape the behaviour of individuals in crowds. It highlights the influence of intra-group and inter-group processes in crowds, and the influence that crowds can have on intra-group and inter-group processes. In the following section, it will be suggested that SCT can transform our understanding of spatiality and crowding just as it has transformed the way in which we conceptualise crowd behaviour.

3.5.3 Applying SCT to spatiality and crowding

As demonstrated in the previous section, until the development of SCT and its application to crowd behaviour, social psychological theories of the crowd tended to focus on either (a) the individual, or (b) a 'collective consciousness'. Most theoretical approaches overlooked the interaction between contextual and individual variables, and simply viewed collective behaviours as the unconstrained, uninhibited, and pathological release of primitive human instincts. Importantly, many approaches shared in common the belief that crowd members had suffered a form of identity-loss and ignored the role that group-dynamics can play in shaping the action of crowds.

It is easy to find similarities between these aspects of the early theories of crowd behaviour and some of the early approaches to spatiality and crowding. Generally speaking, Chapter 2 provides several examples of a hypothesised link between density and pathology. However, more specific comparisons can be made between the crowding literature and pre-SIT/SCT psychological theories of the crowd. We need look no further than just two pages into Insel and Lindgren's (1978) book on the psychology of crowding to find evidence to suggest that the 'collective mind' ideas of Le Bon had trickled down into the crowding literature. Insel and Lindgren (1978, p. 2) warned:

When a crowd becomes a mob, there is little that an individual caught up in it can do to stem its headlong rush into fury or panic. To be a member of an outraged or frightened crowd is to lose one's identity. Self-control and common sense melt away before the intensity of the collective feeling. Crowding, crowdedness, and crowd are therefore potential sources of anxiety in a world that has much to be anxious about. Hence it is difficult to view them without some twinges of antipathy, some predisposition to see them as potential threats to our security, well-being, and perhaps even survival.

On the other hand, in Freedman's (1975) density-intensity theory, which objected to the simple density-pathology link, there was a hint of Allportian individualism. To illustrate, Freedman's (1975, p.105) claim that, "...high density makes other people a more important stimulus and thereby intensifies the typical reaction to them", bears a striking resemblance to Allport's (1924b, p. 295) suggestion that "...the individual in the crowd behaves just as he would behave alone only more so".

While these two approaches to crowding reflected the polar opposites of the individual-group dichotomy in the group and crowd behaviour literature, other approaches simply reflected the general idea of identity-loss. For example, a relatively recent book by Ehrenreich (2007) provides a fascinating account of collective joy throughout history. Her examples of joyful experiences in crowds are plentiful. Just a few examples include: African tribal dances, revolutionary crowds, military parades, carnivals, sports events, rock concerts, and religious rituals.

Ehrenreich's work should certainly be commended for recognising that joy that can be experienced in crowds. It should also be lauded for strongly rejecting the idea that joyful collective experiences are pathological or irrational, and instead suggesting that they are "...at all times subject to cultural rules and expectations" (p. 17). However, while she criticises mainstream psychology for overlooking the collective and focussing on the individual, as is demonstrated in the following quote: "Psychology, almost by definition, focuses on the individual self" (p.9), her own attempts at explaining how and why people sometimes experience collective joy are more than vaguely reminiscent of the 'identity-loss'

ideas, which pervaded the early crowd analyses. Rather than explaining the social psychological relationship between the individual and the collective, and how this relationship can influence affective responses to density, she describes collective joy in terms of *ecstasy*, which by definition can mean to be ‘out of one’s self’. There are several instances throughout Ehrenreich’s book in which collective joy is described in terms of ‘self loss’. For example, when discussing tribal ritual, she comments: “The self-loss that participants sought in ecstatic ritual was not through physical merger with another person but through a kind of spiritual merger with the group” (p. 13). Then later, when speculating about why collective rituals may have eased the depressive symptoms of its participants, Ehrenreich states that it may be because “...they encourage the experience of self-loss, that is, a release, however temporary, from the prison of the self, or at least from the anxious business of evaluating how one stands in the group or in the eyes of an ever-critical God” (p. 152).

While Ehrenreich’s references to self-loss might ring alarm-bells due to their resemblance to those theories of crowd behaviour which have limited our understanding of the phenomena that they seek to explain, her general approach is too valuable to simply dismiss. In fact, much of her work is consistent with the current body of work insofar as it recognises the potential for a positive collective psychology, it rejects the irrationalist approach, it considers the impact that the group can have on individuals, and it considers the ways in which cultural norms and society can guide expressions of collective experience. It simply falls short due to (a) its lack of a developed social psychological account of the multiplicity of the self – the self as a personal and social construct, and (b) for explaining ‘collective joy’ in terms of *ecstasy*, which, as discussed above implies a *loss* of self as opposed to a *shift* in self perception.

As discussed at length in Chapter 2, explaining variations in personal space can be a useful way of explaining such variable psychological responses to crowding. If close proximity is desirable, it will be sought and experienced positively. If it is aversive, it will be avoided (or experienced negatively when it is unavoidable). It was demonstrated in section 2.6.1 how some approaches to personal space take group-level variables into account. For example, they highlight the impact that culture or gender-specific norms can have on how near

or far we wish to be from others, or they state that we prefer to be closer to 'our own kind' (e.g., Leibman, 1970). However, the personal space literature falls short in several ways. These shortcomings were discussed in detail in Chapter 2 (see section 2.6.2). However, the three main criticisms were as follows: (1) most of the theories linking proximity and psychological responses to crowding only account for when a crowd will be experienced negatively, while overlooking the potential positives of crowding, (2) many of the explanatory variables refer to either (i) fixed 'personality' traits, (ii) fixed demographic variables, or (iii) fixed situational variables and therefore, (3) cannot account for (i) intra-individual or intra-group variability in personal space and responses to crowding, or (ii) why crowding might be experienced differently *within* a specific location (such as on a train or football terrace).

It is argued here that each of these problems in the personal space (and hence crowding) literature can be accounted for by SCT. As such, each will be addressed in turn, below. To begin with, however, let us revisit the core hypotheses of SCT. As already mentioned in this chapter, SCT suggests that people can self-categorize according to their own personal identity (i.e., in terms of their differences from other individuals), or in terms of any one of a potentially infinite number of social identities (i.e., in terms of their similarities to fellow category members and differences to members of other categories). The interplay between contextual variables (comparative and normative fit) and personal variables (perceiver readiness) will determine whether a personal or social identity is salient to the perceiver. When a social identity is salient, the perceiver becomes depersonalized – that is, their self-definition shifts from the exclusivity of the personal self, to the inclusiveness of the social self. As a result, those who are perceived as other when a personal identity is salient will become part of self when a social identity is salient. The same applies to group relations. Out-group members will be perceived as other. However, if a contextual shift makes a more inclusive social identity salient, a re-appraisal of self-other relations can make those who were previously other become interchangeable with self. In other words, who is self and who is other is not a psychological given, but a social psychological construct.

Based on these most basic principles, it becomes easy to see how personal space can be translated into the terms of SCT. Personal space

describes the physical boundary between self and other – it is a zone of selfhood. However, as has just been shown, the depersonalization process can have important implications for who is viewed as self and who is viewed as other. If, for example, a person is in a crowd where there are no contextual cues to a social identity, their personal identity will be salient. Therefore, the crowd will be a physical crowd that the person is objectively in but not a crowd that is psychologically important for their self-definition. Thus, all other people in the crowd will be perceived as other. They will be psychologically distant from the perceiver, and as such, the perceiver will wish to maintain physical distance from them. When it is not possible to do so, close proximity to others in the crowd might be experienced as unpleasant. A good example of this might be commuters travelling to work on a crowded train.

However, if in a second scenario, that same person is in a crowd with the same people, in the same physical location, yet contextual cues and perceiver variables increase the salience of a shared social identity, the other crowd members will be perceived as self if they are in-group members. In other words, the crowd will be a psychological crowd – it will be psychologically important to the perceiver. Therefore, in this scenario, there will no longer be a strong self-other boundary between the perceiver and the other crowd members. As the psychological barrier between self and other weakens, the physical barrier will also diminish. Therefore, the person will seek out closer proximity to others present (as they are part of self) and more importantly, that closer proximity to the very same people described in the last scenario will be experienced positively rather than negatively. For example, in Reicher's (1984) analysis of the St Pauls' 'riot' – a crowd event which the media viewed as angry, violent, and aggressive – the 'rioters' talked of intimate physical contact with in-group strangers. One interviewee remarked: "People were so warm: they said, 'glad to be with you, brother', and they put their arm around you" (WM 30, as cited in Reicher, 1984b, p. 16).

The impact of depersonalization on proximity does not end there. It is not simply a case of equating personal identity with distance and negative psychological outcomes, and social identity with closeness and positive psychological outcomes. Imagine a third scenario. This time the same individual is again in the same crowd, with the same people, and the same

social identity is salient. If, in this scenario, the other people are perceived as out-group members, they will again be perceived as others. A good example of this might be a football supporter travelling home on a train carriage packed full of supporters of a rival team. However, rather than being other individuals, as they might be for the commuter in scenario one, this time they will be seen as other in terms of their membership to a different social group. Therefore, the perceiver will again feel uncomfortable if those who are psychologically distant breach the physical barrier between self and other.

Now that the basic application of SCT principles to proximity and crowding have been outlined, it becomes clear that an SCT approach entails a radical reconceptualisation of the concept of 'personal space'. The amount of space that people desire in various contexts is not simply a personal variable – it depends on which identity (personal identity or any one of a number of social identities) is salient in a particular context, and whether the relationship between self and other is on an inter-personal, intra-group, or inter-group level.

Thus, on a theoretical level, SCT can account for the weaknesses in the traditional 'personal space' literature, which were outlined above. First, it can account for variable psychological responses to close proximity in one-to-one interactions, small groups, or crowds, by stating that these responses will depend on contextually determined self-other relationships. Second, it (i) can explain intra-individual spatial variations (as demonstrated in the scenarios above) and (ii) transcends the idea of fixed demographic variables determining proximity. In fact, this last point is a further strength of the SCT approach – that is, it does not discount other hypothesised determinants of 'personal space', such as culture and age. An SCT approach to proximity would suggest that the norms associated with a national identity or a gender identity can influence 'personal space'. If the contextual backdrop to an interaction makes a national identity salient to a perceiver, the relevant cultural norms of proximity seeking will influence how near or far they will want to be from others. However, with an SCT approach, we now have a theoretical framework which can explain proximity seeking within a culture. We can explain spatial behaviours, which on the surface appear anti-normative. The male, English football fans seeking out and enjoying close proximity on the terraces do so, not because they are

English or male, but because they perceive fellow supporters of their team as a part of their psychological self due to their common group membership.

It has now been demonstrated how, in theory, SCT provides the ideal conceptual framework for explaining proximity preferences and crowding responses. In the chapters that follow, the extent to which the theory transfers to practice will be tested in the laboratory and out in the field.

Chapter 4: Behavioural variations in ‘personal space’ – a self-categorization approach.

4.1 Introduction

In Chapter 2, it was suggested that the study of psychological responses to close physical proximity could, and should, be used as a platform from which to explain the variable responses to physical density that characterise the crowding literature. This was based on (a) the empirical observation that people respond negatively when they feel that someone has entered their zone of ‘personal space’, and (b) evidence that a long list of intervening variables can determine how large or small, a person, or group of people’s ‘personal space’ zone will be in any given context. It can therefore be deduced that close proximity in a crowd will be experienced negatively when contextually determined spatial desires exceed the amount of available space.

However, the traditional ‘personal space’ literature was criticised for three reasons. First, it only explained when close proximity would, or would not, be avoided or experienced negatively, but provided no explanation as to why close physical proximity might sometimes actually be sought or experienced *positively*. Second, it provided a long list of ‘personal space’ determinants whilst making little attempt theoretically to link them. And third, as many of the variables on that treat group memberships as fixed demographic facts (e.g., culture, gender, or ‘race’), they cannot explain within-group or within-individual variations in ‘personal space’.

Chapter 3 identified self-categorization theory (SCT; Turner et al., 1987) as the conceptual framework that can explain variability in ‘personal space’ while overcoming these weaknesses. The application of SCT to this area of research was described in detail in Chapter 3 (see section 3.5.3). However, to recap briefly, a self-categorization approach to ‘personal space’ (and hence crowding) links physical and psychological proximity. In line with Turner’s (1999, p. 12) assertion that when depersonalized (self-categorized according to a social identity) “psychologically, the social collectivity becomes self”, a SCT approach suggests that the collapse of the psychological barriers between self and other/s will be reflected by our physical relations to them. If ‘personal space’

refers to a zone of selfhood, inclusion of other/s into our self-definition should impact upon our desire for, and response to, their close proximity. We might seek and enjoy close proximity to others when they are perceived as 'self', but avoid close proximity to those defined as 'other', or experience any unavoidable close proximity negatively.

Importantly, as SCT suggests that our level of self-identity (be it personal, or one of many social identities) depends on social context (and perceiver readiness), it can explain why our desires for close proximity, or our responses to close proximity, are also context dependent. As such, close proximity to others, possibly even the same others, can in theory, be dependent on the contextually determined ways in which we perceive ourselves, and our relationships with others.

There has already been an attempt to show the relation between contextually determined psychological proximity and 'personal space', although it was from a different theoretical perspective to the current body of work. Holland, Roeder, van Baaren, Brandt, and Hannover (2004) drew on the self-construal literature in their attempt to explain the relationship between context, self/other-perception, and proximity. Self-construal relates to a person's understanding of the self and the relationship between the self and other people. Markus and Kitayama (1991) suggested that self-construal should be seen as a dichotomy, which distinguishes between the individual self (self-perception which focuses on individuality and distinctiveness from others) and the interdependent self (self perception which focuses on closeness to, and interconnectedness with others). Holland et al. (2004) suggested that the psychological distinctiveness that dominates the individual self-construal should be reflected by greater distance in interpersonal interactions, whereas the psychological closeness that characterises the interdependent self-construal should be reflected by close physical proximity.

Holland et al. (2004) noted that a great deal of early self-construal research focussed on cross-cultural differences in independence and interdependence (with people from 'Western' cultures said to score high on independence (individualism) and people from 'Eastern' cultures said to score high on interdependence (collectivism; Hofstede, 1980; Markus & Kitayama, 1991). Therefore, if we applied the early self-construal research to 'personal

space', we would be left with a situation that is similar to the one that currently exists in the 'personal space' literature (e.g., Hall, 1966). In other words, we would be able to explain cross-cultural variations, but not within-culture or within-individual variations. Holland et al. (2004) suggested that more recent developments in the self-construal literature could be used to overcome this problem. More specifically, they drew on the observation that independence and interdependence can operate as a function of context, and can therefore vary within broad cultural groups, or even within individuals (e.g., Gardner, Gabriel, & Lee, 1999). It follows from this that individuals should seek closer proximity to others in contexts that make the interdependent self accessible, as opposed to those which prime the independent self.

Holland et al. (2004) conducted a series of studies to test this idea. In their first study, participants in an experimental condition were subliminally primed with the independent self (by having their name momentarily flashed upon a screen), whereas those in a control condition were subliminally exposed to a neutral prime (which involved flashing the Dutch word for 'apple' upon a screen). Participants were then asked to wait in a separate room (apparently to allow the experimenter to set up a second part of the study), which contained a row of four chairs. A chair at one end of the row had a jacket hanging over it to give the impression that it had been occupied. It was found that participants primed with the independent self chose to sit further from the 'occupied' chair than those who had been exposed to the neutral prime. While this implied that an independent self-construal could have an impact on 'personal space', it said little about the extent to which the two levels of self-construal might differ in their impact on proximity.

The researchers used the same research paradigm to probe this question further in a second study. This time, participants were consciously primed with either the independent self (they were asked to think about their differences from family members and close friends) or the interdependent self (they were asked to think about their similarities to family members and close friends). It was found that participants who had the interdependent self-construal activated chose closer proximity to the 'occupied' chair than did those who had the independent self-construal activated. This demonstrated that the contextually

determined and fluid nature of the self (and relationships with others) influenced proximity behaviours.

This strand of research makes a much-needed contribution to the 'personal space' literature by demonstrating how contextual variations can influence self-other perception, which in turn can influence 'personal space'. However, on a theoretical level, it is somewhat limited and does not provide an adequate framework for understanding the diverse range of spatial and crowding behaviours.

The first problem relates to the way in which the self-concept is conceptualised as dichotomous. It simply distinguishes between individualism and collectivism, but overlooks the potential for people to self-categorize according to multiple social identities and thus provides no explanation of the ways in which collectivities (or groups and their identities) might be distinguished from one another. As a result, there is no scope for determining when members of particular social categories will be perceived as 'self' or 'other'. This limits the application of self-construal to spatial behaviours. Let us consider some 'real-world' anecdotal examples to illustrate. Following a football match, rival fans head to the same station to catch a train home. In scenario 1, having just watched his or her team win the match (let's call it 'Team A'), a single fan joins a carriage packed full of fellow 'Team A' supporters, and although it is crowded, he or she decides to stay on the carriage to join in with the revelry. In scenario 2, the same fan steps onto the same carriage to find it packed full of 'Team B' supporters, which leads him or her to step back off of the carriage to avoid close proximity to the crestfallen (and possibly angry) out-group. In both of the scenarios, the single fan would be self-defined in terms of a salient group membership – in terms of a *collectivity* – and the group context of each scenario would drive their behaviour. If a self-construal account were accepted, it would have to be assumed that based on their spatial behaviours, only the fan in scenario 1 would be defined in terms of the collective self, whereas the fan in scenario 2 would be self-defined in terms of their individual self, which is counterintuitive. It is more likely that in both scenarios, the fan would be primed to construe their self in terms of their connectedness to fellow fans of their team (their in-group), and their distinctiveness from fans of the rival

team (the out-group), and not in terms of their individualism and distinctiveness from other individuals.

A second criticism of Holland et al.'s (2004) approach relates to the lack of clarity regarding the contextual factors that might activate an independent or interdependent self-construal. In study 1, Holland et al. (2004) subliminally 'activated' the independent self-construal, whereas in study 2, they primed independence and interdependence by asking participants to think about how different or similar they were to specific people. Thus, they were unclear as to whether self-construal is activated *automatically*, whether people are *self-motivated* to see themselves as independent or interdependent, or whether it is a combination of these two processes. In addition, they did not explicitly state *why* their methods would lead to the activation of either self-construal, or what the processes of self-construal might be outside of the experimental environment. SCT is clear in this regard. It clearly describes the interplay between contextual and cognitive processes (i.e., category fit and perceiver readiness), and how these determine whether a personal identity, or any one of a number of social identities becomes salient. This in turn explains why, and when, individuals or groups will be seen as self or other, and how close we might then want to be to them.

Other studies have lent some support to a SCT approach to 'personal space'. Glick, DeMorest, and Hotze (1988) found that participants approached by a stranger at close proximity responded with less anxiety and greater compliance to a small request (taking part in a survey) when the stranger was an in-group member as opposed to an out-group member – a difference that disappeared when the approach distance was 'far'. In addition, Shah, Brazy, and Higgins (2004) found that participants expecting to engage in competition chose to sit nearer to a team-mate (an in-group member) than a competitor (an out-group member). However, while both of these studies are in line with SCT principles, they are limited as strict tests of the hypotheses derived from SCT as they confounded social categorization with other variables. In the case of Glick et al. (1988), the out-group member who approached the participants was a 'punk-rocker'. Therefore, the anxiety and reduced compliance at close proximity may have been the result of a pre-conceived negative evaluation of 'punks', rather than an effect of categorization per se. With regards to Shah et

al.'s (2004) finding, it could be argued that the closer proximity to a team-mate than a competitor might have been the result of acting in accordance to competition norms (see also Tedesco & Fromme, 1974), rather than a physical representation of psychological proximity.

A SCT approach to 'personal space' suggests that the mere categorization of another person as an in-group member will lead to greater proximity than categorization of that other as an out-group member. Novelli, Drury, and Reicher (2010, study 1)³ carried out an experiment to test this idea, while also attempting to overcome the methodological problems that typified the traditional 'personal space' research. To date, three main methods have been employed in research on 'personal space' (see Gifford, 1997; Hayduk, 1983). First, there are simulation methods, in which participants are asked to place miniature figures on boards as a way of indicating their 'ideal' amount of space. The second method is the 'stop-distance' technique in which a researcher approaches a participant until they are asked to stop. Both approaches are open to the criticisms (a) that people are aware that 'personal space' is being measured and therefore (b) may be unable or unwilling to indicate how much space they would seek in a 'real world' situation. The third method seeks to address this criticism by using naturalistic observations of the amount of 'personal space' which people maintain. However what is gained in ecological validity is lost in the ability to manipulate or control critical variables. Novelli et al. (2010) therefore sought to develop a method of observing 'personal space' behaviours, which retains experimental control while leaving people unaware that their 'personal space' was being measured (cf. Mooney, Cohn, & Swift, 1992).

Participants were invited to take part in what they were led to believe was a 'communication study'. Based on the minimal group paradigm (Tajfel et al. 1971), participants were informed about two 'cognitive categories': dot 'over'- and 'under-estimators' – and told that that members of the two categories differed on a range of cognitive capabilities. Participants were told that they would be 'assessed' to establish which of the groups they belonged to, and then

³ Along with study 1 of the current chapter, this study is included in the following paper: Novelli, D., Drury, J., & Reicher, S. (2010). Come together: Two studies concerning the impact of group relations on 'personal space'. *British Journal of Social Psychology*, 49, 223-236.

asked to take part in a discussion with a second participant who had already been assessed and was due to arrive at the laboratory (there was in fact, no other participant due to arrive). Participants were led to believe that their discussion would be in either an interpersonal, in-group, or out-group context. To achieve this, participants in the group context conditions were provided with false feedback and told that they were not 'under-estimators'. Those in the in-group condition were told that the 'other' was also an 'under-estimator', whereas those in the out-group condition were told that the 'other' was an 'over-estimator'. Participants in the 'interpersonal' condition were not informed of their own, or the 'other' participant's category membership. Following the 'assessment' and feedback phases, the experimenter informed participants that the 'other' was due to arrive at the laboratory and would have to be greeted outside. The experimenter then left the laboratory and asked the participants to set up two chairs for their discussion in a way that made them feel most comfortable. As predicted, participants expecting an in-group interaction required less 'personal space' than those expecting an out-group or interpersonal interaction. There was no difference in proximity for those expecting out-group or interpersonal interactions. The finding that participants sought closest proximity in an in-group context was interpreted as evidence in support of the idea that people seek out closer proximity to those defined as self, than to those defined as other. This is because the latter involves a violation of the self-other boundary, whereas the former does not. It was also concluded that the lack of a significant spatial difference for participants in the out-group and interpersonal contexts was due to the fact the anticipated interactant would have been defined as other in both scenarios.

An (unpublished) analysis of the data in Novelli et al. (2010, study 1) suggested that group context had a moderating effect on the relationship between participants' perceived difference (from their expected interactant) and 'personal space'. For participants expecting an in-group interaction, as perceived difference increased, 'personal space' *decreased*, whereas for participants expecting interaction with an out-group member, an increase in perceived difference led to an *increase* in 'personal space'.

This finding could be interpreted in line with a body of research on stereotype consensualization (e.g. Haslam, Oakes, Reynolds, & Turner, 1999;

Haslam, Oakes, Turner, McGarty, & Reynolds, 1998; Haslam, Turner, Oakes, Reynolds, et al., 1998). Haslam and his colleagues have shown that participants' stereotypical views of an in-group (Australians) and out-group (e.g. Americans) can become more consensualized in inter-group as opposed to intra-group contexts – an effect that is enhanced by group interaction. According to Haslam et al. (1999), when a social identity becomes salient (which would be more likely in an inter-group context), the act of self-stereotyping that follows facilitates in-group consensualization by “(a) enhancing the perceived homogeneity of that in-group, (b) generating associated expectations of agreement with other group members on issues relevant to the shared identity, and (c) producing pressure to actively reach consensus in dealing with those issues through mutual influence.” (p. 810). Thus, the work of Haslam and his colleagues adds to the SCT literature by highlighting that within-group consensus is not simply a product of a shared social identity – it is an active process, achieved via communication.

When this process is considered in relation to proximity, it follows that an anticipated difference from an expected interactant should vary in its impact depending on whether that ‘other’ is an in-group or out-group member. In other words, when participants expect an *in-group* member to be relatively different, they should want to be closer to them in order to communicate with them to actively reach consensus and minimise the perceived difference. However, if an *out-group* member is perceived to be relatively different, their out-group status would be confirmed, and therefore the willingness to engage with them would reduce further – as would any proximity.

4.2 The current research⁴

The study by Novelli et al. (2010) provided an interesting insight into the impact of categorization on spatial behaviours. However, it was a small study, with a number of limitations. First, the sample size was uneven across conditions, as was the number of male participants. Due to the potential effects of gender on personal space (e.g., Sussman & Rosenfeld, 1982; Uzzell & Horne, 2006), a single-sex sample would have been preferable. Second,

⁴ An initial write-up of this study, which is included in Novelli et al. (2010), was written in conjunction with John Drury and Steve Reicher.

there is a possible confound in that participants were all ‘under-estimators’ but in the out-group condition they expected interaction with an ‘over-estimator’. It is possible that the terms ‘over-’ and ‘under-’ have different evaluative connotations. Therefore, participants may have wanted to sit further from the expected out-group interactant due to their evaluation of them as over-confident, inferior or superior in some other way, rather than due to group categorization per se. In addition, Novelli et al. (2010, study 1) asked participants to complete the manipulation checks after they had been told that no other participants were due to arrive at the laboratory. Therefore, it would be preferable to conduct a version of the study in which participants are asked to respond to these items before they are made aware of the deception to ensure that their responses are robust.

The final limitation of Novelli et al.’s study relates to the (unpublished) moderating effect of group context on the perceived difference-proximity relationship. Novelli et al. simply measured perceived difference, which makes it difficult to conclude with any certainty: (a) the dimension on which participants were assessing difference, and (b) the extent to which ‘difference’ was in fact a causal variable.

Thus, the two studies reported in this chapter are designed to overcome these limitations. Study 1 will use an unconfounded and better experimental design in an attempt to replicate Novelli et al.’s (2010, study 1) finding that ‘personal space’ can vary along with minimal group context, while also accounting for potential confounds in the design. In study 2, the possible moderating effect of group context on the relationship between perceived difference and ‘personal space’ will be examined in more detail, with ‘difference’ manipulated rather than simply being measured.

4.3 Study 1

4.3.1 Overview

This study replicates Novelli et al. (2010, study 1) with an improved design. The primary motivation for conducting the study was to establish whether the group effects on ‘personal space’ hold when accounting for the possible confound of the ‘other’s’ identity as an over or under-estimator. Therefore, the redundant

interpersonal condition was not included in the design. There were also a number of small changes made to the procedure in an attempt to enhance the salience of the minimal group identity (as the results from manipulation checks in Novelli et al., 2010, study 1 were unclear). In addition, unlike in Novelli et al. (2010, study 1), where participants were asked to complete the dependent measures after they were told that nobody else was due to arrive at the laboratory, participants were asked to complete the measures of identification and perceived difference before the deception was revealed to them.

It was predicted that there would be no significant difference in 'personal space' between participants allocated to the 'under-' and 'over-estimator' categories. In other words, the *content* of the minimal category membership of the 'other' will have no bearing on 'personal space'. In line Novelli et al (2010, study 1), it was expected that participants would require less 'personal space' when the 'other' belongs to the same minimal category as them (in-group context) compared with those expecting interaction with an out-group member.

4.3.2 Method

4.3.2.1 Design

A 2 (participant's category membership: 'over-estimator'/'under-estimator') x 2 ('other's' category membership: 'over-estimator'/'under-estimator') x 2 (perceived difference: 'similar' to 'other'/'different' from 'other') between subjects factorial design was used.

4.3.2.2 Participants

Undergraduate students from the University of Sussex were contacted via email and offered either course credits or £3 in exchange for their participation. Eighty female participants took part. Their ages ranged from 18 to 44 ($M = 20.94$, $SD = 4.52$). Due to possible effects of culture (Evans et al., 2000; Hall, 1966), sex (Sussman & Rosenfeld, 1982) and/or gender orientation (Uzzell & Horne, 2006) on 'personal space', all of the participants were female, native English speakers.

4.3.2.3 Dependent measures

Participants responded to each of the questionnaire items using a seven-point Likert-type scale, which ranged from 1 (*'not at all'*) to 7 (*'very much'*).

Manipulation check (i): Identification: Three measures of minimal group identification were adapted from Ellemers, Kortekaas, and Ouwerkerk (1999). These items were: *'I identify with other dot under/over estimators'*, *'I am like other dot under/over estimators'*, and *'Being a dot under/over-estimator is a reflection of who I am'*. As the three items scaled together reliably ($\alpha = .80$), their mean was calculated to provide a single score representation of identification.

Manipulation check (ii): Perceived difference of target to self: Three items were designed to measure the extent to which participants felt that the 'other' participant would be different to them. The first two measures were general measures of difference, and simply read: *'I feel as though the other person in the discussion will be a different type of person to me'* (adapted from Novelli et al., 2010, study 1) and *'I feel as though the other person in the discussion will be a similar type of person to me'* (this item was later reversed). The third measure was more specific – it read: *'I expect the other participant in the discussion will have different views to mine'*. The three items did not scale together to a satisfactory degree ($\alpha = .46$), and were therefore included in the analysis as separate items.

Manipulation check (iii): participants' perceptions: Three questions were designed to gauge the participants' perceptions as they took part in the study to explore whether they (a) understood and believed the cover story about the 'cognitive categories' and (b) that they believed that 'another' participant was due to arrive. As minimal groups were used as a basis for identification, it was also important to determine whether the minimal groups were perceived as such by the participants. In other words, participants should not have had a preference for which group they were assigned to. The questions were: *'Did you believe that another participant had gone to find their phone and would return to the laboratory?'*, *'Before I told you which category you belonged to, did you have preference for the over-estimator or under-estimator group?'*, and *'When entering the room, did you notice the badge on other's jacket?'*

Dependent variable: 'Personal space': In line with Novelli et al. (2010, study 1), 'personal space' was operationalised as the distance placed between the participant's chair and the chair of the 'other' participant. Five measures were taken from the chairs to allow for various seating orientations. These were four leg-to-leg measurements and the distance between the middle of the front edge of the base of the seats of either chair. The mean of the five measurements was calculated to provide a single numerical representation of 'personal space'.

4.3.2.4 Procedure

Having agreed to take part in the current study, participants were contacted by the experimenter via email. The email stated that as the study was investigating 'communication styles', two participants were required to take part. The content of the email was designed to introduce the participants to the idea that they would be taking part in the study with another participant.

On arrival at the laboratory, participants were again informed that they would be taking part in a 'communication study', consisting of two parts. They were told that they would be required to complete several computer-based tasks for the first part of the study, whereas for the second part, they would be asked to move to another room, where they would have a discussion with the 'other' participant. Participants were informed that the 'other' had already arrived at the laboratory and had begun completing the computer-based tasks.

Participants were then asked to provide written consent before being led to an area of the laboratory where three experimental cubicles were based. The participants were told that the 'other' was settled in one of the cubicles, and that they would be situated in the other.

Participants were then led into a cubicle and seated in front of a computer and handed a written copy of the participant brief. The brief explained that a series of studies had uncovered several cognitive differences between people who tended to over-estimate or under-estimate how many dots there were in a series of patterns (see Appendix 1 for complete brief). These differences related to analytical problem solving ability, degree of cognitive bias, literacy skills, mathematical ability, and 'social competence'. Participants were not told that either group was better or worse than the other on these cognitive domains,

or exactly what the known differences comprised of. They were simply informed that ‘differences’ had been identified. In order to increase the ‘validity’ of the research described, a false reference was included in the participant brief. In reality, the research described to the participants does not exist. The written brief also stated that the current study was being conducted to further investigate the domain of ‘social competence’, and that the specific interest was to discern whether ‘over’- and ‘under-estimators’ communication styles differed when they were interacting with someone who had either the same or different estimation style to themselves. Prior to leaving the cubicle, the experimenter told participants that he would calculate the ‘other’ participant’s estimation style first, as they would finish the computer-based tasks first, and then get them settled in the discussion room before returning.

The experimenter then left the cubicle while participants provided written answers to the computer-based tasks, which were presented using PowerPoint software. The first task was designed to manipulate group membership and was based on a technique used in the classic minimal group paradigm studies (Tajfel et al., 1971, and Novelli et al., 2010, study 1). Participants were shown a series of eight random dot patterns and asked in each case to estimate the number of dots (see Appendix 2 for an example dot matrix). The second task was designed to enhance the salience of the group identity, and was adapted from the study by Novelli et al. (2010, study 1). Participants completed a questionnaire and were informed that the purpose of the questionnaire was to assess the extent to which their responses were typical or atypical of dot ‘over’- or ‘under-estimators’. The questionnaire contained six hypothetical scenarios, which can be found in Appendix 3. The participants were asked to read each scenario and choose from a series of responses how they would react if they were ever to encounter the scenario. The questionnaire also included four filler questions, which each had four multiple-choice answers (see Appendix 3). Participants were asked to listen to a song via headphones while completing the computer-based tasks. This was to ensure that they would not hear anything that might, or might not, have been happening in the next-door cubicle. A question that related to the length of the musical piece was included in the ‘typicality’ measure.

When participants had completed the computer-based tasks, the experimenter re-entered the cubicle. On doing so, he announced that the experiment might take a few minutes longer than originally planned because the 'other' participant had realised that she had left her mobile phone in the nearby café, and had subsequently gone to find it. The participant was told that should the 'other' not return when the discussion was due to begin, the experimenter would walk to the café to see if he could find her.

The experimenter then pretended to conduct a series of calculations before informing the participant that they were either an 'over-' or 'under-estimator', depending on which 'category' condition they had been assigned to. All participants were told that the 'typicality' measure indicated that they were 'typical' of their group. Participants were then asked to wear a red or blue badge with either 'under-estimator' or 'over-estimator' written on it in an attempt to reinforce the group identity. The experimenter then informed participants that the 'other' participant was in either the same or different cognitive category to them (to manipulate group context).

Figure 4.1 shows the layout of the 'discussion room'. The room was set up to give participants the impression that the 'other' had set herself up for the discussion before rushing off to look for her phone. This was achieved by placing a chair in the room with a young woman's denim jacket hanging over the back of it (with either an 'over-' or 'under-estimator' badge attached to it, depending on which 'group' condition the participant had been assigned to) in position 1. A bag and a half-full bottle of water were placed on the floor next to the chair. A copy of the questionnaire that contained the measures was placed on the 'other's' chair, along with a pen, to create the impression that the 'other' had left it there before rushing off to look for her phone.

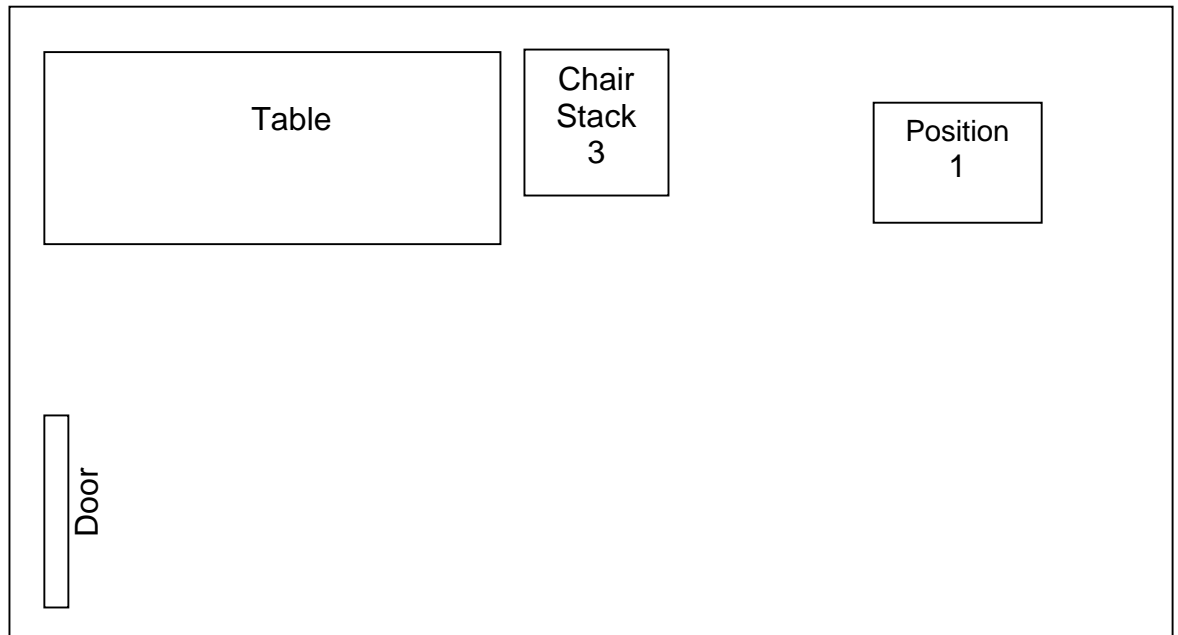


Figure 4.1 Room layout (Chapter 4, study 1)

Participants were then asked to follow the experimenter through to the room where they would be having a 'discussion' with the 'other' participant. On arrival, the experimenter stated that as the 'other' had not yet returned to the laboratory, he would walk to the café to see if he could find her. The experimenter asked the participant to enter the discussion room, take a chair from the stack at the side of the room and set herself up for the discussion, however she felt most comfortable. The participant was handed a questionnaire and asked to complete it when she was settled. As the participant entered the discussion room, the experimenter left the laboratory and waited outside for approximately three minutes to allow the participant enough time to set up her chair, settle, and fill in her questionnaire. The experimenter then re-entered the room, revealed the deception to the participant, and asked her not to move either of the chairs. Before providing a full debrief, the experimenter asked the participant to answer the three questions relating to her perceptions of the experimental situation. The participant was then debriefed, paid, and told that she could leave. When the participant had left the room, the experimenter measured the distance between the chairs.

4.3.3 Results

4.3.3.1 Manipulation checks

(i) Identification: In order to assess whether the minimal group identity had been successfully imposed on the participants, one-sample t -tests were conducted on the combined data obtained from the identity measures. High scores would indicate a high level of identification whereas low scores would indicate low levels of identification. The mean score on the identification scales ($M = 3.58$, $SD = 1.33$) significantly differed from the mid-point of the scale (4), $t(79) = -2.80$, $p = .006$ which suggests that outwardly at least, participants were displaying relatively low levels of identification. Importantly however, when comparing participants in the intra-group conditions ($M = 3.60$, $SD = 1.27$) and those in the inter-group conditions ($M = 3.57$, $SD = 1.40$), there was no significant difference between their levels of identification $t(78) = 0.11$, $p = .91$ (ns), $r = .01$. Therefore, any potential differences in 'personal space' between these groups would not be due to different levels of identification.

(ii) Perceived difference of target to self: In line with SCT, and central to the experimental design of the current study, out-group condition participants were expected to perceive the 'other' to be more different, and less similar to them, than those in the in-group conditions. This was not the case when the scores for two of the items were analysed: '*I expect the other participant in the discussion to hold different views to mine*' (in-group $M = 4.45$, $SD = 1.13$; out-group $M = 4.68$, $SD = 1.20$), $t(78) = -.86$, $p = .39$ (ns), $r = .10$; '*I feel as though the other person in the discussion will be a different type of person to me*' (in-group $M = 4.08$, $SD = 1.19$; out-group $M = 3.80$, $SD = 1.40$), $t(78) = 0.95$, $p = .35$ (ns), $r = .11$. Importantly however, when the scores from the reversed measure '*I feel as though the other person in the discussion will be a similar type of person to me*' was analysed, participants in the in-group conditions ($M = 3.70$, $SD = 0.97$) scored significantly lower than those in the out-group conditions ($M = 4.43$, $SD = 1.15$), $t(78) = 3.05$, $p = .004$, $r = .33$ with a medium effect size. This suggests that in-group participants perceived the 'other' to be less different to them than did the participants in the out-group conditions. This provides at least some evidence, albeit not entirely consistent, that the out-group and in-group contexts were successfully manipulated.

(iii) Participants' perceptions

Q1: *Did you believe that another participant had gone to find their phone and would return to the laboratory?*

All of the participants answered 'yes' to this question. Therefore, it can be concluded that the cover story was successful.

Q2: *Before I told you which category you belonged to, did you have preference for the over-estimator or under-estimator group?*

The majority of the participants (70) responded to this question by stating that they had no preference for which group they would be categorized as members of. Of the ten who expressed a preference, seven stated that they wanted to be in the 'over-estimator' category, whereas three expressed a preference for the 'under-estimator' category.

Q3: *When entering the room, did you notice the badge on other's jacket?*

This question was added to establish whether participants were considering the 'other's' group membership when entering the 'discussion' room (although, importantly, the badge was only one of the cues to the 'other's' group membership. It was found that 70 participants did notice the other participant's badge, whereas 10 did not. This suggests that the participants were considering the 'other's' minimal group category to some extent.

4.3.3.2 Main effects

(i) 'Personal space'

Outliers: In order to establish whether or not there were any outliers in the current data set, the mean 'personal space' scores were converted to z-scores. According to Field (2005), when a z-score is greater than 3.29 it indicates a significant outlier. This was found to be the case for one participant in the current study, for whom the mean 'personal space' z-score was 3.76. In order to correct this problem in the data, the mean 'personal space' measurement for the participant who produced the outlying score was converted to the next highest score in the data set, plus one unit (which in this case was one inch) (see Field, 2005).

(a) Group context: Analysis of variance revealed a significant main effect of group context on 'personal space', $F(1, 78) = 7.42, p = .008, \eta^2 = .09$.

Examination of the means demonstrates that as hypothesised, participants who were anticipating an in-group discussion placed the chairs closer together ($M = 46.56$ inches, $SD = 1.19$) than did those who were expecting discussion in out-group contexts ($M = 51.15$ inches, $SD = 1.19$).

(b) Minimal group identities: As predicted, analysis of variance revealed no significant difference in 'personal space' for participants assigned to the 'over-estimator' and 'under-estimator' identities, $F(1, 72) = 0.24, p = .58$ (ns), $\eta^2 = .004$ ('over-estimator' $M = 48.45$ inches, $SD = 6.93$, 'under-estimator' $M = 49.30$ inches, $SD = 8.57$). More importantly, there was no significant difference in 'personal space' between participants expecting to interact with an 'under-estimator' and those expecting interaction with an 'over-estimator', $F(1, 76) = 0.28, p = .60$ (ns), $\eta^2 = .004$ (interaction with an 'under-estimator' $M = 48.47$, $SD = 6.87$, interaction with an 'over-estimator' $M = 49.39$, $SD = 9.00$). There was however, a significant interaction, $F(1, 76) = 7.29, p = .01, \eta^2 = .09$. In line with the finding that group context significantly influenced 'personal space', the greatest distances were for 'over-estimators' expecting interaction with 'under-estimators' and for 'under-estimators' expecting interaction with 'over-estimators'.

4.3.4 Discussion

Using an improved experimental design, the findings from Novelli et al. (2010, study 1) were replicated. Participants expecting interaction in an in-group context required less 'personal space' than those expecting an out-group interaction. There was no difference in 'personal space' between participants expecting interaction with an 'over-estimator' and those expecting to interact with an 'under-estimator'. Therefore, the alternative explanation for Novelli et al.'s (2010, study 1) finding – that participants may have been seeking greater distances from 'over-estimators' due to the perceived evaluative superiority of 'over-estimators' – has been eliminated. The finding that spatial preferences can vary as a function of group context highlights that spatiality is something

that should not necessarily be seen as something that is always ‘personal’, but as something that can be dependent on self/other distinctions, which can function at the level of the group as well as the individual.

The three questions designed to probe participants’ perceptions of the experimental paradigm provided some useful insights. First, as all participants indicated that they believed that another participant was due to arrive at the laboratory, and that they had gone to look for a ‘lost’ phone, it can be concluded that the experimental paradigm had a good degree of plausibility. In addition, the fact that the majority stated that they had noticed the colour of the ‘other’s’ badge, indicates that they were conscious of the group context of the discussion that they were about to take part in.

Now that the impact of group relations on ‘personal space’ has been shown to be robust, the second study to be presented in this chapter provides an opportunity to test the impact of perceived difference on ‘personal space’ within in-group and out-group contexts.

4.4 Study 2

4.4.1 Overview

The primary objective of Study 2 is to investigate further the extent to which the group context of an interaction can moderate the relationship between perceived difference and participants’ spatial preferences. An (unpublished) analysis of the data from Novelli et al. (2010, study 1) found that participants in in-group contexts sought less space as perceived difference increased, whereas those in out-group contexts required more space as they perceived the ‘other’ to be more different from self. As discussed in section 4.1.1, it was speculated that this finding was in line with the consensualization literature; participants wanted to be closer to a ‘different’ in-group member as they actively strove to reach agreement with them, but further from a ‘different’ out-group ‘other’ as their out-group status had been confirmed and hence there was little point in trying to reach consensus.

The main limitation of Novelli et al.’s finding was that perceived difference was simply measured, which makes it impossible to determine (a) the domain on which participants were assessing difference, (b) whether they were in fact all assessing difference on the same domain, and (c) the causal direction of the

relationship between 'difference' and 'distance', seeing as difference was not manipulated.

The current study seeks to overcome these problems by combining the experimental paradigm used in Novelli et al. (2010, study 1) and study 1 of the current chapter, with the one used by Haslam et al. (1999) in a stereotype consensualization study. Haslam et al. (1999) found that when making a national identity (Australian) salient, participants expressed a shared stereotypical view of Australians (the in-group) – an effect that was strengthened by intra-group discussion. In line with Haslam et al. (1999) national identities will be used as the basis for categorization, with the in-group being English and the out-group being American. Perceived difference will be manipulated on the dimension of stereotypical views of Englishness.

In line with Novelli et al. (2010, study 1), and the consensualization literature, it was predicted that participants would seek closer proximity to an in-group other when they believed that other held relatively different, as opposed to relatively similar, stereotypical views of Englishness (in an attempt to reconcile this difference). In contrast, it was predicted that participants would seek greater distance from an out-group other when they believed that their stereotypical views were relatively different, as opposed to relatively similar (because this difference would confirm their out-group status). It was predicted that participants' desire to reach consensus would mirror their spatial behaviour. In other words, 'in-group-different' participants would express a stronger desire to reach consensus than 'in-group-similar' participants, whereas 'out-group-different' participants would express a weaker desire to reach consensus than 'out-group-similar' participants. Finally, in line with Novelli et al. (2010, study 1) and study 1 of this chapter, it was predicted that participants expecting an in-group interaction (with another English person) would require less space than those expecting an out-group interaction (with an American).

4.4.2 Method

4.4.2.1 Design

A 2 (group context: in-group/out-group) x 2 (perceived difference: similar/different) between subjects factorial design was used for the current study.

4.4.2.2 Participants

Sixty-four female, English, undergraduate psychology students whose ages ranged from 18 to 55 ($M = 22.22$, $SD = 8.27$) took part in the study in exchange for £4 or course credits. As with study 1, a single-gender sample was used (to eliminate potential gender differences in spatial preferences). When questioned at the conclusion to the study, three participants stated that they did not believe that another participant would be arriving at the laboratory and that they did not expect to interact with anyone. They were therefore excluded from the final analysis. One participant did not set up the chair for the 'other' and therefore provided no data. Thus, the final sample consisted of 60 participants with an age range of 18 to 55 ($M = 22.07$, $SD = 8.16$).

4.4.2.3 Materials and measures

All of the items were anchored by 1 (*not at all*) and 7 (*very much/very*).

(i) Independent variable 1 – Group context and social identity. Manipulation and manipulation checks: To manipulate group context, participants were simply told that the 'other' participant was English (in-group) or American (out-group). To check the manipulation of group context, participants responded to the following two items: *I feel as though the other person in the discussion will be a different type of person to me* and *I feel as though the other person in the discussion will be a similar type of person to me* (which was later reverse scored).

Participants were asked to respond to four items in an attempt to enhance the salience of their English identity. In line with Haslam et al. (1999), they were asked to list up to three things that they and other English people do relatively often, relatively rarely, that they generally do well, and that they generally do badly. In order to assess the participants' identification, they were asked to

respond to the single item '*How important is your nationality to you?*'. It was assumed that a score significantly above the mid-point of the scale would be indicative of relatively high national identification. Following Haslam et al. (1999), a single-item measure was considered sufficient for the following reasons: (1) to maximise simplicity, and (2) to make the measure as unobtrusive as possible to reduce reactivity.

(ii) Independent variable 2 – 'perceived difference'. Manipulation and manipulation check: As this study was designed to examine physical orientation during the consensualization process, stereotypical views of the in-group, or in other words, English people (assessed using the Katz-Braly, 1933, checklist), were used as the domain on which to manipulate perceived difference. While participants' stereotypical views of the out-group could have been used, with the same processes expected (see Haslam et al., 1999), in-group stereotypical views of the in-group were used to retain consistency with Haslam et al. (1999). To assess the effectiveness of the manipulation, participants were asked to respond to the item '*When you discuss the selection of five English traits in the next phase of this study, how much do you expect to agree with the other participant?*' (adapted from Haslam et al., 1999).

(iii) Behavioural measures – spatial preferences (dependent variable 1): Participants' spatial preferences were measured in exactly the same way as in study 1 (see section 4.3.2.3).

(iv) Self-report measure to investigate desire to reach consensus (dependent variable 2): Desire to reach consensus was measured using the item '*When you discuss the selection of five English traits in the next phase of this study, how much do you want to agree with the other participant?*' (adapted from Haslam et al., 1999).

4.4.2.4 Procedure

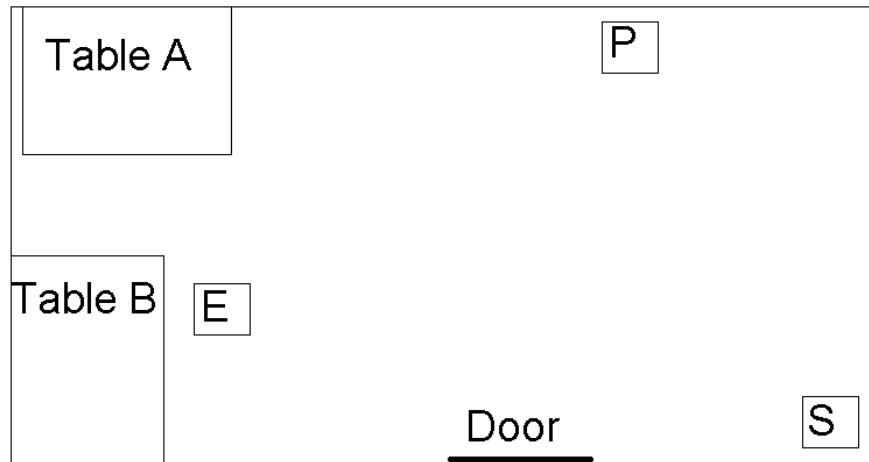


Figure 4.2 Room layout (Chapter 4, study 2)

When invited to participate in the study, potential participants were informed that the study was investigating the views of Englishness held by English and American people. The initial recruitment email stated that the American quota of participants had been filled, but that more English participants were needed. The instructions stated that the study took place over two phases – the first via email, and the second in the laboratory. Having expressed an interest in participating and agreeing a time in which to take part, participants were sent phase one of the study, which was a copy of the Katz-Braly (1933) checklist, along with instructions stating that participants should pick the 20 adjectives from the 84 in the checklist (see Appendix 4 for the full list of traits) which best describe the traits of English people **in contrast to** people from America. They were asked to return the 20 adjectives to the experimenter via email. The instructions also stated that the participant would take part in the study with another participant, and that their responses to phase one would be compared.

For phase two, participants arrived at the laboratory at the designated time and were greeted by the experimenter. The laboratory contained two desks, which were located to one side of the room (see Figure 4.2), and a stack of four chairs which were located in position 'S'. When the participants entered the room, the experimenter took a chair from the stack, placed it in position 'P' and asked the participant to take a seat.

Two sets of materials for the study were placed on clipboards on table A. A badge was placed on top of the materials. The participant's badge was always blue with 'English' written on it, whereas the 'other's' was either a blue 'English' badge or a red badge with 'American' written on it, depending on the group context. The experimenter approached the two sets of materials and asked for the participant's name. When she had replied, the experimenter stated that the 'other' participant had just emailed to say that she might arrive at the laboratory five or ten minutes late. The participants were assured that this should not impact too greatly on the time that they would spend in the laboratory, and that they should still be able to leave within half an hour as originally planned as the experiment tended not to take as long as originally stated. They were then told that the study consisted of an individual phase and then a group phase, which would involve discussion with the second participant.

Having signed a consent form, participants were handed their pack of materials and told that they could start the individual phase while waiting for the second participant to arrive, and that the 'other' could then catch up. They were instructed to work through the materials in the following order. First, they completed the social identity enhancement task (that is, three things that they an other English people do often, rarely and well). They then turned to a sheet of paper containing the 20 words they had picked to describe English people in contrast to Americans, where they found the following instructions:

Below are the 20 traits you initially selected to describe English people in contrast to Americans. Go back over the words and mark with an 'X' the five words which seem to you most typical of people from England in contrast to Americans.

When the participants had picked five words, they then turned to the next sheet, which contained the following instructions:

You will now be asked to discuss your five adjectives with the second participant, who is English/American [*deleted by experimenter as appropriate*]. The other participant picked 1/17 [*deleted by experimenter as appropriate*] of the same traits as you from the original checklist when

describing English people in contrast to Americans. Before the discussion, please complete the questionnaire which can be found on the following page.

For participants in the in-group conditions, the instructions stated that the 'other' was English, whereas those in the out-group conditions were told the 'other' was American. For each of these groups, those in the 'similar' conditions were told that the 'other' had picked 17 of the same traits as them from the original checklist, whereas those in the 'different' conditions were told that the 'other' had picked 1 of the same traits as them to describe English people in contrast to Americans. Finally, participants completed a questionnaire containing the manipulation checks and consensus measures, as well as an item which asked them to state how many of the same traits they and the other participant had picked from the original checklist (this was to ensure that they had noticed the 'difference' manipulation). During this phase of the study, the experimenter sat in position 'E' with his back to the participants.

When the participants had completed the tasks, they were given their national identity badge and asked to wear it. The experimenter then stated that he had hoped that the 'other' would have arrived before the participant completed the individual phase and that as she still had not arrived, he was going to see if she was waiting for him in the reception area, which was located along the corridor. As he was just about to leave the room, the experimenter asked the participant to arrange the room for the discussion by taking a chair from the stack and setting it up for the 'other'. They were asked to do so in a way that made them feel comfortable. The experimenter then left the room for one minute before re-entering, revealing the deception and fully debriefing the participants.

4.4.3 Results

4.4.3.1 Manipulation checks

(i) National identification: A one-sample *t*-test revealed that the mean score on the measure designed to measure the participants' English identity was significantly greater than the mid-point of the scale ($M = 4.48$, $SD = 1.50$, $t(59) = 2.49$, $p = .02$) suggesting a successful manipulation. There was no difference

in identification between participants in the in-group ($M = 4.73$, $SD = 1.41$) and out-group conditions ($M = 4.23$, $SD = 1.57$), $F(1, 56) = 1.70$, $p = .20$ (ns), $\eta^2 = .03$, nor between those in the 'similar' ($M = 4.60$, $SD = 1.61$) and 'different' conditions ($M = 4.37$, $SD = 1.40$), $F(1, 56) = 0.37$, $p = .55$ (ns), $\eta^2 = .01$. There was no interaction between group context and 'difference' on identification, $F(1, 56) = 2.18$, $p = .15$ (ns), $\eta^2 = .04$. These findings suggest that any variation on the dependent variables will not be due to differences in social identification.

(ii) Perceived difference, national identity: The two items designed to measure perceived difference (one reversed item) scaled together reliably ($\alpha = .77$) and were therefore combined to produce a composite measure of perceived difference. In line with SCT, participants should score higher on this general measure of perceived difference when the expected discussion was with an out-group, rather than an in-group 'other'. However, there was no difference between participants in in-group ($M = 4.13$, $SD = 1.18$) and out-group contexts ($M = 3.88$, $SD = 1.26$), $t(58) = 0.79$, $p = .22$ (ns), $r = .10$, which raises some concerns as to the extent to which group context was successfully manipulated.

(iii) Expected consensus: In order to assess the extent to which participants expected the 'other' to be similar or different to them in their stereotypical views of English people in contrast to Americans, their mean scores on the item *'When you discuss the selection of five English traits in the next phase of this study, how much do you expect to agree with the other participant?'* were examined. As predicted, participants in the 'similar' conditions ($M = 5.07$, $SD = 0.94$) expected to agree with the 'other' more than those in the 'different' conditions ($M = 3.07$, $SD = 1.20$) to a highly significant degree and with a large effect size, $t(58) = 7.17$, $p < .001$, $r = .69$.

When comparing the 'similar' and 'different' groups on the measure of difference used to examine the manipulation of *group context*, the same pattern of results emerged. Participants in the 'similar' conditions ($M = 3.47$, $SD = 1.01$) expected the 'other' to be more similar to them than did those in the 'different' conditions ($M = 4.55$, $SD = 1.18$) again to a significant degree and with a large effect size, $t(58) = -3.83$, $p < .001$, $r = .45$.

4.4.3.2 Main effects and interactions

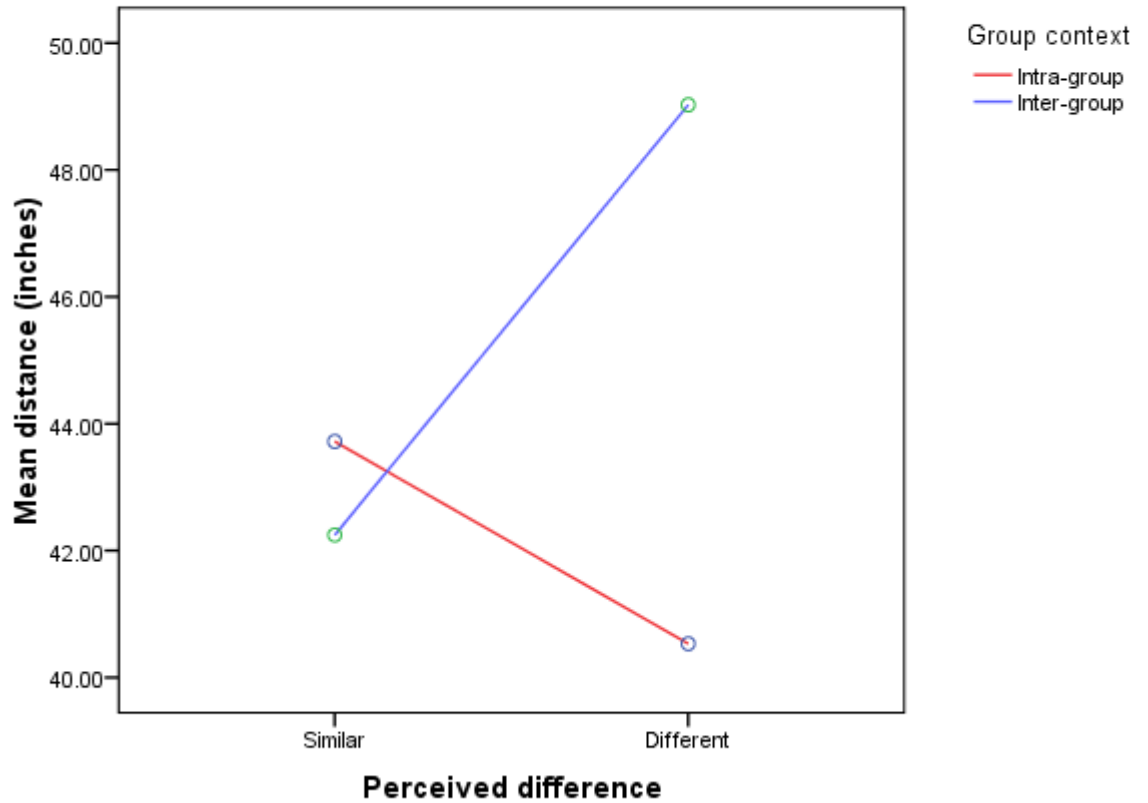


Figure 4.3 The effect of group context and perceived difference on 'personal space'.

(i) Spatial preferences: When converted to z-scores, two cases exceeded 3.29, suggesting that they are significant outliers (Field, 2005). Both of these cases were in the 'inter-group-different' condition. To correct for this problem, both scores were converted to the next highest score in the data set plus one unit (inch).

Main effects: As predicted, and in line with study 1, participants who were anticipating discussion with an in-group member required less space ($M = 42.13$, $SD = 7.46$) than those expecting discussion with an out-group member ($M = 45.64$, $SD = 10.67$). However, this difference was not significant, $F(1, 56)$

$= 2.30, p = .136, \eta^2 = .04$. When comparing the 'personal space' of participants in the 'similar' and 'different' conditions, those expecting discussion with a similar 'other' placed the chairs closer together ($M = 42.98, SD = 8.89$) than did those who were expecting to have a discussion with a different 'other' ($M = 44.78, SD = 9.76$), although to a non-significant degree, $F(1, 56) = 0.60, p = .44, \eta^2 = .01$.

Interactions: In general support for the hypothesis, there was a significant interaction, $F(1, 56) = 4.64, p = .036, \eta^2 = .08$. As displayed in Figure 4.3, participants anticipating a discussion with an in-group member required *less* space when the 'other' was perceived as relatively different ($M = 40.53, SD = 5.03$) as opposed to relatively similar ($M = 43.72, SD = 9.19, t(28) = 1.18, p = .25$ (ns)) in terms of their stereotypical views of Englishness, although not to a significant degree. In contrast, those expecting a discussion with an out-group 'other' required *more* space when they perceived the 'other' to be relatively different ($M = 49.03, SD = 11.54$) as opposed to relatively similar ($M = 42.25, SD = 8.83, t(28) = -1.81, p = .08$), to a marginally significant degree. Simple effects analysis reveals that as a result of this interaction, while there was not a significant difference in the spatial preferences for in- and out-group participants when they felt that they would be similar to their interaction partner ($F(1, 56) = 0.20, p = .65$), in-group condition participants required significantly less space than out-group conditions participants when they felt that their views of Englishness would differ from their interaction partner's ($F(1, 56) = 6.74, p = .01$).

(ii) Self-report data: Consensus: Contrary to hypothesis 2, there was no difference in desire to reach consensus (assessed using the item '*When you discuss the selection of five English traits in the next phase of this study, how much do you want to agree with the other participant?*'), between participants expecting a discussion in an in-group context ($M = 4.57, SD = 1.10$) and those expecting an out-group discussion ($M = 4.63, SD = 1.19, F(1, 56) = 0.05, p = .824, \eta^2 = .00$). Likewise, there was no difference between those in the 'similar' ($M = 4.73, SD = 0.98$) and 'different' ($M = 4.47, SD = 1.28$) conditions, $F(1, 56) = 0.81, p = .374$ (ns), $\eta^2 = .01$. It was predicted that the desire to reach

consensus results would mirror participants' 'personal space' requirements. In other words, group context was expected to moderate the relationship between perceived difference and desire to reach consensus, with an increase in difference leading to a greater desire to reach consensus for participants expecting an in-group discussion, but a decrease in desire to reach consensus for those expecting a discussion in an out-group context. This prediction was not supported, $F(1, 56) = 1.27$, $p = .265$ (ns), $\eta^2 = .02$.

Alternative analyses were conducted to explore these results further. Repeated measures t -tests were carried out in order to establish whether there were significant differences between the extent to which participants expected to agree with the 'other', and the extent to which they wanted to agree with them. To lend further support to a consensualization explanation, it was expected that participants in the in-group-'different' condition would have scored significantly higher on the desire to reach consensus scale than they did on the expected consensus scale, whereas for those in the out-group-'different' condition there would either be no difference, or a decrease between the scores on the two scales. This prediction was only partially supported. In actual fact, for participants in both of these conditions, participants scored significantly higher on the 'want to agree' scale than they did on the 'expect to agree' scale (in-group-'different': *expect to agree* $M = 2.87$, $SD = 1.06$, *want to agree* $M = 4.27$, $SD = 1.33$, $t(14) = -3.00$, $p = .009$, $r = .63$; out-group-'different': *expect to agree* $M = 3.27$, $SD = 1.33$, *want to agree* $M = 4.67$, $SD = 1.23$, $t(14) = -5.96$, $p < .001$, $r = .85$).

4.4.4 Discussion

One of the reasons for conducting study 2 was to attempt to replicate the finding that when a social identity is made salient, people require less space when an expected interaction is with an in-group 'other' as opposed to an out-group 'other' (Novelli et al., 2010, study 1, and study 1 of the current chapter). In support of previous research, it was found that participants arranged the chairs so that they were an average of 3.5 inches closer to their expected interactant when the context was in-group as opposed to out-group. Although this finding was non-significant, the difference between the in- and out-group distances was only 1 inch smaller than that observed in study 1. It should be noted, however,

that the p -value reported was two-tailed, even though the hypothesis was one-tailed. A one-tailed p -value would have yielded a marginally significant result, thus supporting the hypothesis. Thus, in short, the pattern of the main effects was exactly the same in studies 1 and 2.

Despite the finding that spatial preferences varied as a function of group context, some of the manipulation checks raised some doubts regarding the extent to which group context had in fact been successfully manipulated. It is likely that this reflected a weakness with the measurement items used. The items designed to measure the manipulation of group context simply asked whether participants believed that the 'other' would be a different or similar type of person to them. As participants had only just been told that the 'other' was similar or different to them in terms of their stereotypical views of Englishness, it could be that they responded to these items in terms of this level of difference rather than in terms of group memberships. This view is supported by the fact that participants in the 'similar' conditions consistently scored higher than those in the 'different' conditions on the items that were actually designed to measure group context. Any replication of the current study should use items specifically designed to measure the manipulation of group context.

The primary motivation for conducting this study was to investigate the processes underlying the relationship between perceived difference and spatial preferences in greater detail. When perceived difference and group context were manipulated so that participants were expecting a discussion with either an in-group (English) or an out-group (American) member, who was perceived to hold either similar or different stereotypical views of Englishness as them, their spatial preferences mirrored the (unpublished) pattern observed in previous research (Novelli et al., 2010, study 1). As expected, perceived difference led to a *decrease* in 'personal space' for those in in-group contexts (although this decrease was non-significant, perhaps due to the loss of power associated with reducing the N to 15 in each cell), but to a (marginally significant) *increase* for those in inter-group contexts. It should be acknowledged, however, that the absence of a group-level 'personal space' effect for participants in the 'similar' conditions, was not expected. Based on SCT, the spatial difference between in-group and out-group participants should be significant regardless of perceived difference, due to the fact that in-group

members would still be perceived as self, whereas out-group members would still be seen as other. Although this finding is not easily explained, one possible interpretation might be that the history of alliance and cooperation between England and the United States, coupled with the manipulated perception of similarity might have weakened the psychological boundary between self and other to some extent, hence leading to a relaxation of the physical self-other boundary.

Despite this unexpected finding, it was hypothesised that the moderation effect that was observed might be explained in terms of the stereotype consensualization literature (e.g. Haslam et al., 1998; Haslam et al., 1999). According to Haslam et al. (1998), “when people perceive themselves to share group membership with another person in a given context they will both *expect to agree* with that person on issues relevant to their shared identity, and also be motivated to *strive actively to reach agreement* on those issues” (p. 758, emphases in original). Thus, it was hypothesised that a manipulated difference in stereotypical views (of the in-group) in an in-group context would conflict with the expectation of agreement. Participants would subsequently move closer to a ‘different’ in-group member as they actively strove to remedy the situation that they were faced with. It was also hypothesised that in contrast, participants might *expect to disagree* with an out-group member and would therefore be satisfied with any imposed difference. As they would then have no inclination to strive for agreement, they might then seek greater distance from the out-group ‘other’ who they were about to engage in discussion, due to the fact that their out-group status had been confirmed. This was shown to be the case.

However, to strengthen a consensualization explanation of these findings, it would be expected that participants’ self-reported desire to reach consensus would have reflected their spatial preferences; those in the ‘in-group-different’ condition should have wanted to reach agreement more than those in the ‘in-group-similar’ condition, whereas those in the ‘out-group-different’ condition should have wanted to reach agreement less than those in the ‘out-group-similar’ condition. This prediction was not supported. An alternative analysis was therefore conducted: participants’ expected agreement and desire to reach agreement scores were compared with repeated tests. In line with a consensualization approach, it would be expected that participants expecting a

discussion with an in-group member who was perceived to hold different views to them would want to agree with the 'other' significantly more than they expected to agree with them. This was indeed the case. However, for the second part of this hypothesis to be true, participants expecting a discussion with an out-group member who was perceived to hold different views of 'Englishness' to them, should have expressed either a) no difference between the extent to which they expected and wanted to reach agreement, or b) their level of desire to reach agreement should have been significantly lower than the level to which they expected to agree. This was not found to be true; as was the case for participants in the 'in-group-different' condition, participants in the 'out-group-different' condition wanted to agree with the 'other' significantly more than they expected to do so.

So, if desire to reach agreement with a different 'other' is the same for participants in both in-group and out-group contexts, how can the proximity difference between these conditions be explained? It is suggested here that this finding is a methodological artefact. It could be that participants were reacting to the experimental situation and responding in what they felt was a socially desirable manner. To elaborate, participants were expecting an imminent discussion with a second participant, and regardless of the group context of that discussion, they may have felt uncomfortable with (a) expressing a desire to disagree with the second participant, and (b) the thought of actually having a disagreement in such a novel and observed experimental context, thus motivating them to express a desire to reach consensus.

Such an explanation fits with a recently published series of studies conducted by Goff et al. (2008). In a similar vein as much of my own work, participants were asked to set up chairs for an anticipated discussion. All of the participants were white and their expected discussion partners were either white or black. It was found that when the discussion topic related to 'racial' profiling (a topic which could evoke fear in the white participants that they might appear racist) participants sought greater distance from their black partners than from their white partners. These spatial differences were not observed when the discussion topic related to love and relationships.

The authors explained these findings in terms of stereotype threat. The distancing from black discussion partners when the discussion topic was 'racial'

profiling was positively correlated with the activation of a white racist stereotype. This led the authors to suggest that fear of appearing racist led participants to distance themselves from their black discussion partners – an ironic effect which could in fact lead the participants to appear to be more racist.

In light of this research, it could be suggested that the results observed in the current study operated on two levels – one for those expecting an in-group interaction, and another for those expecting an out-group interaction. For participants expecting a discussion with an in-group member who differed from them in their stereotypical views, the closer proximity may have been due to the consensualization process outlined above. However, the spatial preferences of participants expecting a discussion with an out-group member (who they differed from) may have resulted from processes similar to those observed by Goff et al. (2008). Prior to becoming aware that they would be discussing their stereotypical views of Englishness with another person, participants were asked to pick traits which best described English people in contrast to Americans. As many participants had picked traits which showed English people in a positive light, they may have feared appearing anti-American in their discussion with an American participant who disagreed with their views. This in turn may have motivated them to express a desire to reach consensus, while also seeking greater distance from the American ‘other’, with both responses being employed to avoid appearing anti-American.

Of course, such an explanation is speculative at present, and future researchers are encouraged to investigate it thoroughly, as further investigation of these processes is beyond the scope of this thesis. However, if this explanation were to be supported, the initial hypothesis put forward in this chapter would have to be altered. It was predicted that participants would seek greater distances from a ‘different’ out-group ‘other’ simply because their out-group status had been confirmed. However, if the results should be understood in terms of Goff et al.’s (2008) work, then distance from the out-group member might concern the avoidance of negative portrayal of the in-group in a potentially confrontational inter-group context. Of course, an alternative explanation might be that depending on the content of the discussion and the particular identities, either of these processes might become operational.

To summarise these findings, the single most important thing to emerge from this study is that regardless of the fact that the behavioural and self-report measures used in the current study did not correspond with one another, this does not necessarily contradict a consensualization explanation of the participants' *behavioural* approach to the discussion. Haslam et al. (1998) suggested that people actively strive to agree with a person with whom they share a social identity when discussing issues that are central to that identity. Therefore, the closer proximity to an in-group 'other' who differed in their stereotypical views of Englishness, and greater distance sought from an out-group 'other' who differed in their stereotypical views may shed some light on the active behavioural process that facilitates intra-group consensualization.

4.5 General discussion

Taken together, the results from these studies support the argument that, when defined in terms of group memberships and hence depersonalized, participants are more comfortable with less 'personal space' from an in-group member than an out-group member (or a non-group member, as was the case in Novelli et al., 2010, study 1).

Participants in these studies required approximately 10% more space in an in-group context than in an out-group context in study 1, and approximately 8% more space in study 2 (possibly because the groups used were national identities, with a history of amicable relations between English people and Americans). If these differences are summed to account for spatial preferences in large crowds of people, it becomes apparent that there may well be a large difference in the amount of space required for an in-group crowd, a crowd made up of different groups of people, or a crowd which consists a large number of individuals, to feel comfortable.

This has important practical implications. Several mathematical models of crowd-flow have been designed to assist building and public space planners with their designs (e.g. Helbing, Farkas & Vicsek, 2000; Pan, Han, Dauber & Law, 2007). While these models are mathematically sophisticated, they have tended to treat the spatial preferences of a crowd as a constant – they lack a psychological model of spatial preferences in crowds (Still, 2000). Along with Novelli et al. (2010, study 1), the studies described in the current chapter

suggest that such an approach is flawed, and that the impact of group relations on spatial preferences should be incorporated into these mathematical models; an approach already advocated by crowd-flow researchers (e.g., Langston, Masling, & Asmar, 2006; Smith, James, Jones, Langston, Lester, & Drury, 2009).

The second set of findings to emerge from this chapter relates to the moderating effect of group context on the relationship between perceived difference and personal space. As discussed at length in section 4.4.4, perceived difference had a contrasting effect on distance for participants in intra-group and inter-group contexts, with the former seeking closer proximity, and the latter seeking greater distance when the 'other' was perceived to hold different stereotypical views of Englishness. This finding is consistent with the consensualization literature, as it may be a reflection of the behavioural process which facilitates intra-group consensus. The implication of this finding is that 'similarity' and 'difference' should not necessarily been seen solely as antecedent of group formation. Instead, the impact of perceived difference from those defined as in-group members might lead to increased displays of physical intimacy, rather than a re-categorization of those people as out-group members.

The theoretical implications of the findings discussed in this chapter do not end there. The fact that spatial preferences can vary as a function of group context should not necessarily be seen as just another addition to an already long list of categorization effects. Instead, it should be seen as a hint towards an interplay between psychological and physical proximity. It can be seen as a demonstration of the group existing not only in the mind as a cognitive representation, but also in space, as a physical unit. Therefore, the evidence that categorization of other people as part of the self affects our physical relations with those people raises questions regarding the extent to which the nature of our physical relations feeds back and impacts upon or self-categorizations (see Cassidy et al., 2007). This question will be probed further in Chapters 7 and 8.

To summarise, then, the results of these studies suggest that in line with Novelli et al. (2010, study 1), we are more comfortable with close proximity to in-group members than we are with close proximity to out-group members. This finding, which has been interpreted in line with the principles of SCT, provides a

first step to understanding how contextual variables might impact upon, (a) the perceived relationship between self and others (i.e., how close we are to them on a psychological level), (b) the extent to which our physical proximity is influenced by our psychological proximity, and can therefore, (c) explain within-group and within-individual variations in spatial behaviours, and hence crowding. While this chapter provides a powerful insight into the impact of group-relations on the behavioural dimension of spatiality, and in doing so, hints strongly at the impact that group relations might have on the experience of close proximity, the following chapter will seek to probe the impact of group relations on the experiential dimension of 'personal space' in greater detail.

Chapter 5: Group context and the experience of proximity – A self-categorization approach

5.1 Introduction

The studies presented in Chapter 4 (and Novelli et al., 2010, study 1) have demonstrated the impact that group relations can have on proximity-seeking behaviours. When asked to arrange chairs for a discussion, participants expecting interaction with an in-group member placed the chairs closer together than did those expecting interaction with an out-group member. This unobtrusive behavioural measure provided an important first step towards demonstrating the strength of applying SCT to so-called 'personal space'. That is, participants' perception of in-group members as 'self' and out-group members as 'other' was reflected in the physical distances that they sought from them. This finding has highlighted that the spatial preferences of a single-gender, Western sample can vary along with the group context of an interaction. As participants were randomly assigned to conditions, and all of the participants took part in the study in the same laboratory environment, this finding has accounted for several of the weaknesses associated with the traditional 'personal space' literature – i.e., intra-individual, intra-demographic, and within-location variations in proximity can now be explained using a unified theoretical framework rather than in terms of disjointed intervening variables.

The studies described also provided a preliminary solution to another of the problems associated with the traditional approach to 'personal space'. While the traditional approach explained why close proximity might be experienced negatively (due to a person's accepted zone of 'personal space' being breached), it did not account for those instances in which physical closeness might be experienced positively or even sought out. A SCT approach would suggest that close proximity to individuals in one-to-one interactions, small groups, or large crowds should be experienced more positively when those individuals are in-group members (self), and more negatively when they are out-group members (other). This is because close proximity to out-group others involves a violation of the self-other boundary, whereas close proximity to those perceived as self would involve no such

violations. As participants were asked to set the chairs up at a distance which made them feel most comfortable, this suggestion, has in part, been supported. However, this finding emerged when participants were given freedom to choose their interaction distance. As such, questions still remain regarding how group-relations might impact on the subjective *experience* of close proximity when interaction distance is a function of circumstance as opposed to free choice.

Research investigating the impact of group-relations on the experience of close proximity is sparse. There is, however, a small body of work that suggests that belonging to a psychological group can impact upon the crowding experience. As mentioned in Chapter 2 (section 2.4), Schultz-Gambard (1977) found that even though high density generally led to negative psychological responses from their participants (they felt more stressed and rated the room as more unpleasant, less comfortable, and less cosy) they felt more positive towards other group members when they felt that they belonged to a common group. A SCT approach to spatiality and crowding would interpret this finding in terms of the common group identity leading to a perceptual shift towards inclusiveness. As such, the other people co-present would be perceived as self and subsequently viewed more positively.

Other work supports this general view. For example, using a 2 x 2 design, Webb, Worchel, Riechers, and Wayne (1986) examined the effects of group categorization and interaction distance on perceived crowding in small groups. Participants took part in the study in groups of six people who were arranged in a circle formation. For groups in the 'near' conditions, the front corners of the chairs were touching, whereas for groups in the 'far' conditions, a gap of half a metre was left between the front corner of the chairs. All of the participants were told that they should imagine that they were employees of a large company, brought together to work on a project. In the 'group categorisation' conditions, participants were asked to wear lab-coats; two wore red coats (said to represent the marketing division), two wore blue coats (said to represent the research development division) and two wore white coats (said to represent the personnel department). Participants in the 'no group categorisation' conditions were simply told that they should imagine that they were each from a different division from within the company. Webb et al. (1986) found that participants in the 'near' condition felt more crowded than those in the 'far' condition.

However, they also found an interaction between distance and ‘group context’. Participants in the ‘categorisation’ and ‘no categorisation’ conditions did not differ in their reported feelings of crowdedness when the interaction distance was ‘far’. However, when the interaction distance was ‘near’, participants in the ‘categorised’ condition felt less crowded than did those in the ‘non-categorised’ condition

Although this finding is consistent with SCT, Webb et al.’s methodology raises more questions than it answers, while their interpretation of their results is open to debate. On a methodological level, as all of the participants were told that they worked for the same company, it seems strange that the researchers should conclude that only those who wore lab-coats would have been categorised according to a common group membership – especially seeing as they did not report results of a manipulation check to support this conclusion. With regards to their interpretation of their results, Webb et al. suggested that their findings should be considered in terms of deindividuation theory. In other words, they suggested that participants in the ‘group categorisation’ conditions (those wearing lab-coats) might have become less self aware due to their ‘submergence’ in the group (cf. Diener, 1980). A deindividuation approach simply implies a loss of personal identity, and in doing so, seeks to explain group processes solely in terms of *individuals* and an ‘all-or-none’ account of identity (the problems associated with such an approach to group and crowd processes were outlined in detail in Chapter 3, section 3.5.2). Webb et al. did not use measures of self-awareness in their design to support their deindividuation interpretation of their results, thus weakening their claims further. It is argued here that an understanding of *group* processes based on shifts in, rather than loss of identity, would provide a clearer understanding of Webb et al.’s results.

Drawing on SCT, Webb et al.’s findings could be interpreted in one of two ways. The first interpretation would focus on intra-group processes and suggest that as all of the participants were told that they worked for the same company, participants in all of the conditions would have self-categorised according to a common group identity (the company). However, for participants in the ‘group categorisation’ conditions, the lab-coats (company uniforms) may have served to enhance the salience of the group identity, thus increasing

psychological proximity between the group members, and decreasing feelings of crowdedness in the physically close condition.

The second interpretation would focus on both intra-group and inter-group processes. As participants in the 'no group categorisation' conditions were told that they were each from different divisions from within the company, they may have felt that they belonged to different groups and hence perceived others co-present as 'other'. However, participants in the 'group categorisation' conditions were divided into three divisions, with two participants in each. Therefore, each participant might perceive at least one other person as a common category member, and hence a psychological extension of self. If this interpretation is correct, it follows that for participants in the 'near' conditions, those in the so-called 'no group categorisation' condition would be sitting adjacent to two people perceived as other (two out-group members), whereas those in the so-called 'group categorisation' condition would be sitting adjacent to one person perceived as other (an out-group member), and one person perceived as self (an in-group member). It therefore makes sense that participants in the 'no group categorisation' condition would feel more crowded than those in the 'group categorisation' condition. Of course, it is impossible to decipher which of these retrospective accounts is correct simply from Webb et al's (1986) paper. The important point, however, is that both are consistent with SCT, and that both of these alternative accounts interpret the results in terms of group processes, as opposed to a theory that frames the self in purely individualistic terms. This seems sensible when the nature of the experimental design is considered.

While the work of Schultz-Gambard (1977) and Webb et al. (1986) provides indirect support for a SCT approach to the experience of close proximity, an unpublished study by Fenn (2006) directly tested the applicability of SCT to this dimension of spatiality. As part of an undergraduate project supervised primarily by John Drury, and also by myself, Fenn (2006) adapted the 'personal space' paradigm, which I designed and applied in Chapter 4 of this thesis and in Novelli et al. (2010). We felt that Fenn's undergraduate project provided a good opportunity to conduct some pilot work for the experiments presented in this chapter.

Female students from a grammar school in Dorset, England, were informed of the 'differences' between the so-called cognitive categories of dot 'over-' and 'under-estimators' (which are actually minimal categories – see section 3.3). They were told that a simple test would establish which of the categories they belonged to. Having been 'assessed', participants were randomly assigned to a minimal category and told that they would be involved in an interview style role-play with another participant who was either an in-group member or an out-group member. The other participant was actually a confederate. The distance between the participants' chair and that of the confederate was either 34 inches (in the 'near' condition) or 54 inches (in the 'far' condition). These distances were based on the mean proximity preferences for participants in expecting discussion with an in-group member (38.60 inches) or out-group member (48.00 inches) in Novelli et al. (2010, study 1). In other words, the 'near' distance was four inches closer than the mean in-group 'personal space' in Novelli et al. (2010, study 1) while the 'far' distance was six inches further than the mean 'personal space' for participants in the out-group condition.

The participant and confederate were then allocated to the interviewer and interviewee roles. Although this was made to appear random, the confederate always played the role of the interviewer. The interview, which focussed on the interviewees' future aspirations, was carried out for three minutes before the experimenter intervened, stating that enough information had been collected. Participants and the confederate were then asked to complete a questionnaire containing measures of their experience, which were designed by Fenn for the purpose of the study. The measures related to aspects of experience such as how relaxed and at ease the participants felt during the interview, as well as how much they enjoyed it and whether they would be willing to participate in a follow-up study.

Main effects of interaction distance and group context were observed. With regards to interaction distance, it was found that participants in the 'far' conditions had a significantly more positive experience than those in the 'near' conditions. With regards to group context, participants interacting with an in-group member had a significantly more positive experience than those interacting with an out-group member. However, the most interesting finding to

emerge was that participants in the out-group-‘near’ condition scored lowest on the experience scale – i.e., they had the least positive experience of the interview. In line with SCT, this finding was interpreted as evidence in support of the idea that the experience of close proximity can depend on the group context of an interaction. That is, whether an interactant is perceived as self or other can impact on how we experience close proximity to them.

Fenn’s (2006) study provided an interesting insight into the possible effects of group context and interaction distance on participants’ subjective experience. However, a potential confound in the experimental design should be acknowledged. When briefed on the differences between ‘over-’ and ‘under-estimators’, participants were told that one group tended to perform *better* than the other in multiple-choice exams. Thus, it becomes difficult to conclude with certainty that participants in the out-group ‘near’ condition had the most negative experience simply because they were asked to interact at close proximity to a person perceived as other. It could instead be argued that participants may have felt uncomfortable with such close proximity because they perceived the confederate to be inferior or superior in their ability to perform well in multiple-choice examinations. An attempt will be made to overcome this potential methodological weakness in the experimental design of the studies described in this chapter.

5.2 Study 3

5.2.1 Overview

This study follows Fenn’s (2006) pilot research. The primary objective is to establish whether the effects of group context and expected interaction distance on participants’ subjective experience will hold when a better, unconfounded experimental design is used. To improve the design, and hence eliminate the potential for group-categorisation to be confounded with perceived superiority/inferiority, participants will simply be informed of cognitive differences between the minimal groups used (as was the case in Chapter 4, study 1 and also in Novelli et al., 2010), rather than being told that one group is ‘better’ than the other on a particular domain.

The names assigned to the minimal groups in the current study also differed from those used by Fenn (2006), Novelli et al. (2010, study 1), and

Chapter 4, study 1. In each of those studies, the minimal groups were named as dot ‘over-estimators’ and dot ‘under-estimators’. However, for the purpose of the current study, the brief simply stated that people could be divided into two cognitive categories based on their ‘estimation style’ – i.e., the cognitive categories were not named. Participants were informed that the categories would be represented by a colour – either red or blue. This was to eliminate any possibility that naming the categories as dot ‘over’ and ‘under’ estimators may have confounded the experimental design (see Chapter 4, section 4.2)⁵.

The measures of subjective experience used for the current study also differed from those used by Fenn (2006). Fenn (2006) conceptualised ‘subjective experience’ in terms of participants’ enjoyment, relaxation, and spatial requirements, as well as their willingness to take part in a follow-up study, how at ease they felt, and how friendly the other participant was perceived to be. There is some inconsistency between these ad hoc items. For example, one item probed perceptions of confederate friendliness, which is in fact a measure of other-perception, whereas another probed participants’ spatial requirements. These two dimensions of experience seem fairly far removed from one another. Therefore, a more consistent measure of subjective experience will be used in the current study. As discussed in the preceding chapters, close physical proximity can sometimes be associated with joyful affective responses (e.g., at sports stadiums and nightclubs), whereas at other times, it can be associated with negative affective responses (e.g., on public transport or in shopping malls). As such, participants’ subjective *affective* state will be the primary dependent measure in the current study, and will be gauged using an established measurement scale.

A secondary dependent measure will be participants’ expressed desire for closer proximity to their expected interactant. Although this should be seen as an additional measure of subjective experience, using a measure of desired proximity also provides an opportunity to consolidate the behavioural results obtained in chapter 4 with a self-report measure. In the studies described in the

⁵ This study was conducted before the results of Chapter 4, study 1 had been obtained and analysed fully. Therefore, questions still remained regarding whether participants in Novelli et al. (2010, study 1) sought greater distances from out-group members (who were dot ‘over-estimators’) because of perceived arrogance, inferiority/superiority etc., rather than because of group categorisation per se. These concerns later proved to be unfounded, and as such, removing ‘under-estimator’ and ‘over-estimator’ tags from the groups was unnecessary.

previous chapter, group context was manipulated and then participants were allowed to place the chairs wherever they pleased. As a result, participants sought closer proximity to in-group members than they did to out-group members. Like the studies described in the previous chapter, group context will be manipulated in this study. However, participants will not be given freedom to choose their interaction distance. It will therefore be interesting to obtain a self-report measure of desired proximity to establish whether effects of group context and interaction distance emerge.

A final methodological difference between the current study and that conducted by Fenn (2006) related to the participants' interaction partner. Rather than using a confederate to play the part of the other participant so that the actual participants experience close proximity to another person, the empty chair approach that was developed in Novelli et al. (2010) and in Chapter 4 of this thesis was used. In other words, participants simply anticipated interaction with an in-group or out-group member, and then experienced close proximity to an empty chair, thus providing a sterner test of the hypotheses.

Several hypotheses were formulated. The first set of hypotheses related to the measures of subjective affective experience. First, it was predicted that participants expecting interaction with an in-group member would report higher levels of positive affect and lower levels of negative affect than those expecting interaction with an out-group member. In line with Fenn's (2006) pilot work, it was predicted that participants expecting interaction at close proximity to an out-group member would report the lowest levels of positive affect and the highest levels of negative affect due to their close physical proximity to someone defined as 'other'. Second, it was predicted that participants expecting interaction in the 'close' conditions would report lower levels of positive affect and higher levels of negative affect than those expecting interaction in the 'far' conditions. This prediction is not derived from SCT – it simply comes from the fact that the distance used in the 'near' condition was closer than any of the mean distances observed in Chapter 4 (and Novelli et al., 2010).

With regards to the measure of desired proximity, it was first predicted that participants expecting interaction in the 'close' conditions would express a weaker desire to be seated closer to their expected interactant than would

participants in the 'far' conditions. Again, this was due to the fact that the distance used in the 'close' condition was closer than any of the mean distances observed in the studies preceding this one (i.e., Chapter 4, studies 1 & 2; Novelli et al., 2010). Second, it was predicted that participants in the out-group conditions would express a weaker desire to be seated closer to their expected interactant than would the participants in the in-group conditions. Desire for closer proximity was expected to be lowest for participants expecting interaction with an out-group member at 'close' proximity, and highest for participants expecting interaction with an in-group member in the 'far' condition.

5.2.2 Method

5.2.2.1 Design

A 2 (group context: in-group/out-group) x 2 (interaction distance: 'near'/'far') between subjects factorial design was used.

5.2.2.2 Participants

Undergraduate students at the University of Sussex were contacted via email and offered either course credits or £3 in exchange for their participation. Forty students, whose ages ranged from 18 to 42 ($M = 21.23$ years, $SD = 3.98$), were recruited. As was the case for the studies described in Chapter 4, the sample comprised of female native English speakers due to the potential effects of culture (see Evans et al., 2000; Hall, 1966), sex (see Evans & Howard, 1973) and/or gender (see Uzzell & Horne, 2006) on 'personal space'.

5.2.2.3 Dependent measures

Participants responded to the measures of identification, perceived difference and desired proximity using a seven-point Likert-type scale, which ranged from 1 ('not at all') to 7 ('very much').

Manipulation check (i): Identification: Participants' identification with the minimal group categories was measured using the same three items that were used in Chapter 4, study 1 (adapted from Ellemers et al., 1999). However, the wording was adjusted slightly to account for the fact that the cognitive categories were no longer referred to as dot 'over' and 'under-estimators'. The adjusted items were as follows: *'I identify with other people who are in the same*

group as me, *I am like other people who are in the same group as me*, and *The group I belong to is a reflection of who I am*. As these items scaled together reliably ($\alpha = .75$), their mean was calculated and used to represent participants' identification with the minimal group.

Manipulation check (ii): Perceived difference of target to self: Perceived difference was measured using the same three items that were used in Chapter 4, study 1 (see section 4.3.2.3). It was found that the two measures of 'difference' and the reversed measure of 'similarity' scaled together reliably ($\alpha = .72$) and were therefore included as a composite measure of difference.

Dependent variable (i): Subjective affective experience: Participants' levels of positive and negative affect were assessed using the Positive and Negative Affect Schedule (PANAS) scales (Watson, Clark, & Tellegen, 1988) (see Appendix 5). Participants rated their positive and negative feelings and emotions at that moment on a scale that ranged from 1 (*very slightly or not at all*) to 5 (*extremely*). The positive affect items ($\alpha = .88$) were summed to obtain a single-score representation of positive affect and the negative affect items ($\alpha = .83$) were summed in order to gain a single-score representation of negative affect.

Dependent variable (ii): Desired proximity: A single item was administered to participants to gauge their desired proximity to the 'other' participant. This item was: *Would you prefer to be closer to the other participant?*

5.2.2.4 Procedure

The experimental paradigm was very similar to the one used in Chapter 4, study 1 (see section 4.3.2.4). As such, a detailed description will not be repeated here. However, there were some changes, which will be outlined below.

First, as the cognitive categories were no longer referred to as dot 'over-' and 'under-estimators', the participant brief was adjusted accordingly (see appendix 6). In addition, the format of the estimation tasks differed slightly from Chapter 4, study 1. Rather than allocating participants to groups based on their dot-estimation score and then assessing their 'typicality' using their responses to the multiple choice questions, participants were told that their 'cognitive style' and 'typicality' would be assessed using a single score that would be calculated following their completion of both of these tasks/measures.

The next set of procedural changes were minor. As the minimal groups in the current study were represented solely by a colour, the badges were not labelled. All of the participants were told that they were in the category represented by the colour blue, and therefore asked to wear a blue badge. As was the case in Chapter 4, study 1, the 'discussion' room was arranged so that it looked as though the 'other' participant had left her personal belongings on a chair before rushing off to look for her mobile phone. The 'other's' personal artefacts were the same as those used in the previous study. Again, the 'other's' jacket had a badge representing the minimal group attached to it. The badge was blue when participants anticipated interaction was with an in-group member and red when the expected interaction was with an out-group member.

The final change to the procedure relates to the way in which the chairs in 'discussion' room were set up. In Chapter 4, study 1 and Novelli et al. (2010), just the 'other's' chair was arranged and the participant was asked to take their own chair from a stack at the side of the room. However, as interaction distance was used as an independent variable in the current study, two chairs were arranged to manipulate the distance at which the actual participants expected to interact with the fictional 'other'. The chairs were arranged so that they were either 'close to' or 'far away' from one another. It could of course, be argued that obtaining objective measures of 'close' and 'far' distances could be troublesome. Therefore, the distances obtained from Chapter 4, study 1 were used as guidelines.

The mean proximities obtained from the in-group participants in Chapter 4, study 1 were used as guidance for the 'close' distance. First, the mean distances placed between the nearest front legs of the chairs ($M = 24.46$ inches, $SD = 6.68$), the furthest front legs of the chairs ($M = 47.74$ inches, $SD = 6.94$), and the middle of the front edge of the seats ($M = 34.46$ inches, $SD = 5.68$) by in-group participants were calculated. Then, the mean of the standard deviations of these three distances was calculated ($M SD = 6.43$) and subtracted from each of the three distances obtained. These distances were then rounded to the nearest half an inch. It was felt that subtracting the mean standard deviation from mean intra-group distance from Chapter 4, study 1 (which was the closest mean distance) would provide a 'close' interaction distance. The final 'near' distances were as follows: distance between nearest

front legs = 20 inches; distance between the furthest front legs = 41.5 inches; distance between the middle of the front edge of the seats = 28 inches.

The mean distances from the participants expecting an out-group interaction in Chapter 4, study 1 were used as guidelines to obtain a ‘far’ distance in the current study. First, the mean distances between the nearest front legs of the chairs ($M = 31.58$, $SD = 9.75$), the furthest front legs ($M = 51.64$ inches, $SD = 7.45$), and the middle of the front edge of the seats ($M = 38.96$ inches, $SD = 7.59$) for out-group participants were calculated, as was the mean standard deviation ($M SD = 6.26$). The mean of the standard deviations was then *added* to each of the above mean distances – which were then rounded up to the nearest half an inch – to provide three new ‘far’ distances. These distances were as follows: distance between the nearest front legs = 38 inches; distance between the furthest front legs = 58 inches; distance between the middle of the front edge of the seats = 45 inches.

5.2.3 Results

5.2.3.1 Manipulation checks

Identification: A one-sample t -test was conducted to examine whether participants displayed a clear acceptance or rejection of the minimal group identity. It was found that the mean level of identification ($M = 4.08$, $SD = 1.05$) did not significantly differ from the mid-point of the scale, $t(39) = 0.50$, $p = .62$ (ns). Although this suggests that participants did not outwardly reject the minimal group identity, it also suggests that the manipulation did not induce identity very well. Importantly, there was not a significant difference in identification for participants expecting interaction with an in-group member ($M = 4.05$, $SD = 0.98$) and those anticipating interaction with an out-group member ($M = 4.12$, $SD = 1.14$), $t(38) = -0.20$, $p = .84$ (ns), $r = .03$. Therefore, any between-condition differences on the dependent measures cannot be attributed to differences in levels of identification.

Perceived difference of target to self: In line with SCT principles, participants expecting an inter-group interaction perceived the ‘other’ to be significantly more different from them ($M = 4.87$, $SD = 0.96$) than did participants who were expecting an intra-group interaction ($M = 4.12$, $SD = 1.08$), $t(38) = -2.16$, $p = .037$, $r = .33$, with a medium effect size. This at least

provides some evidence to suggest that the group context of the anticipated interactions was successfully manipulated.

5.2.3.2 Experience measures: Main effects and interactions

Table 5.1 shows the means and standard deviations for the three dependent variables (positive affect, negative affect and desired proximity) for participants expecting interaction with either an in-group member or out-group member at a 'close' or 'far' interaction distance. A 2 x 2 multivariate analysis of variance (MANOVA) was conducted to assess the effect of group context and interaction distance on these dependent variables. Using Pillai's trace, it was found that the MANOVA revealed significant multivariate main effects for group context, $F(3, 34) = 4.63$, $p = .008$, $\eta^2 = .29$, and interaction distance, $F(3, 34) = 7.19$, $p = .001$, $\eta^2 = .39$, but no interaction between these two independent variables, $F(3, 34) = 0.28$, $p = .84$ (ns), $\eta^2 = .02$.

Table 5.1

Means and standard deviations for participants expecting discussion with an in-group or out-group members at 'close' or 'far' interaction distances (study 3).

Dependent variable	Experimental condition			
	In-group	In-group	Out-group	Out-group
	'Close'	'Far'	'Close'	'Far'
Positive affect				
<i>M</i>	29.10	29.40	30.30	29.30
<i>SD</i>	7.06	5.99	7.96	6.27
Negative affect				
<i>M</i>	12.40	13.90	12.50	16.00
<i>SD</i>	3.34	4.72	3.66	4.59
Desired proximity				
<i>M</i>	2.40	4.20	1.40	3.20
<i>SD</i>	0.97	1.81	0.70	1.40

Note: desired proximity relates to participants' desire to be closer to their discussion partner.

Separate univariate analyses of variance (ANOVAS) were conducted to examine the effects of group context and interaction distance on each of the dependent variables. With regards to positive affect, the main effects of group context, $F(1, 36) = 0.06$, $p = .80$ (ns), $\eta^2 = .002$, and interaction distance, $F(1, 36) = 0.03$, $p = .87$ (ns), $\eta^2 = .001$, and also the interaction between these two variables, $F(1, 36) = 0.09$, $p = .77$ (ns), $\eta^2 = .002$, were not significant. Therefore, the hypothesised effects of group context and interaction distance on positive affect were not supported. Likewise, the hypothesised effects of group context and interaction distance on participants' self-reported levels of negative affect were not supported by the data. While the main effect of group context on negative affect was non-significant, $F(1, 36) = 0.71$, $p = .40$ (ns), $\eta^2 = .02$, there was a marginally significant effect of interaction distance, $F(1, 36) = 3.68$,

$p = .06$, $\eta^2 = .09$. Contrary to expectations, participants in the ‘far’ condition reported higher levels of negative affect than participants in the ‘close’ condition. Finally, with regards to desired proximity, there were significant main effects of both group context, $F(1, 36) = 6.00$, $p = .02$, $\eta^2 = .14$ (with a medium effect size), and interaction distance, $F(1, 36) = 19.44$, $p < .001$, $\eta^2 = .35$ (with a large effect size) on participants’ desire to be closer to their expected interactant. As expected, participants anticipating interaction with an out-group member expressed a weaker desire to be closer to the ‘other’ than did those expecting to interact with an in-group member, while those expecting interaction in the ‘close’ conditions expressed a weaker desire for closer proximity than did those in the ‘far’ condition. There was no interaction between the two independent variables, $F(1, 36) = 0.00$, $p = 1.00$ (ns), $\eta^2 = .000$. Interestingly, however, and in line with an SCT approach to spatiality, the findings reveal that participants in the out-group ‘close’ condition expressed the weakest desire for closer proximity, whereas those in the in-group ‘far’ condition expressed the strongest desire to be closer to their expected interaction partner.

5.2.4 Discussion

The main reason for carrying out the current study was to investigate the potential effects of group context on participants’ subjective affective experience when they had no control over the amount of space between themselves and their expected discussion partner. Contrary to expectations, there was no effect of group context on positive or negative affect, regardless of the distance at which the expected interaction was to take place. This finding could be interpreted as evidence to suggest that affective responses to close proximity do not vary as a function group relations – at least when an interaction is on a one-to-one basis in the sterile laboratory environment. However, alternative explanations should first be considered. First, only a small sample (40) was recruited, resulting in only ten participants per cell, and reducing the power of the experimental design. Second, unlike the study conducted by Fenn (2006), in which a confederate was used, participants in the current study *anticipated* interaction with another person. As a result, they simply sat next to an empty chair. Whilst sitting next to the chair, they were asked to complete the questionnaire containing measures of the dependent variables. The first set of

items in the questionnaire was the PANAS, and as such, it could be argued that participants may not have had time to give their discussion partner, or the group context of their interaction much thought when reporting their affective state.

This study did find a marginally significant effect of interaction distance on participants' reported negative affect. In contrast to expectations, higher levels of negative affect were reported for participants in the 'far' conditions than for participants in the 'close' conditions. This finding was not expected, and is not easily explained. Perhaps participants interpreted the excessive interaction distance as a violation of a conversation norm, which in turn made them feel uneasy about the discussion that they were anticipating. Interaction distance had no impact on reported levels of positive affect.

It was also hypothesised that desired proximity – which can be seen as an alternative measure of subjective experience – would vary as a function of group context and interaction distance. As expected, participants expecting interaction at 'close' proximity expressed a weaker desire to be closer to their discussion partner than did those expecting interaction in the 'far' conditions. However, more importantly, and in line with the observations made in Chapter 4 – and hence a SCT approach to spatiality – participants anticipating interaction with an in-group member wanted to be seated closer to their discussion partner than did those anticipating interaction with an out-group member. Of the four conditions, participants in the in-group-'far' condition expressed the strongest desire for closer proximity, which supports the view that people seek out relatively closer physical proximity to those defined as self when they find themselves 'far' away from them. In contrast, participants in the out-group-'close' condition expressed the weakest desire for closer proximity, which lends support to the idea that the desire to seek closer physical proximity to someone defined as other diminishes when asked to interact at a distance which might already be perceived as 'too close'. Unlike the measures of affect, the measures of desired proximity were completed towards the end of the questionnaire and actually involved participants thinking about their physical relationship with their discussion partner.

While this study has confirmed the hypothesis that psychological proximity can influence participants' desire for physical proximity, its failure to find an effect of group relations on the subjective affective experience of close proximity

will be addressed in the following study. To address the possibility that (a) the use of an empty chair and (b) asking participants to complete the measures of affect before they had an opportunity to think at any length about the nature of their relations to the person with whom they were about to interact, may have (c) resulted in a test of the hypotheses that was simply too demanding, a confederate will be used in study 2.

5.3 Study 4

5.3.1 Overview

This study again sought to measure experiential outcomes of group context and proximity manipulations. As discussed above, rather than simply expecting an interaction with another person and then waiting next to that person's empty chair, participants in the current study were involved in an interaction (in the form of an interview-style role-play) with a confederate before being asked to fill in the measures of the dependent variables.

There were some slight adjustments to the measures of the dependent variables. As was the case in study 3, participants' subjective affective experience was of interest. However, some of the measures of subjective experience used by Fenn (2006) – which do not relate to affect, but to the actual positive experience associated with the interaction with the confederate – were included as dependent measures in the current study. These items were included in order to establish whether Fenn's (2006) findings could be replicated when the outcome measures focussed on specific measures of experience, or whether diverse measures would uncover similar results. The items adapted from Fenn (2006) will be referred to as measures of subjective positive experience. As was the case in study 3, participants' desired proximity was also measured.

It was predicted that participants would have a more positive experience in terms of (1) their subjective experience, and (2) their subjective *affective* experience, following interaction with an in-group, as opposed to an out-group confederate. It was predicted that these effects would be stronger when the interaction distance was 'close' as opposed to 'far'. It was also expected that due to the extremely close proximity imposed in the 'close' condition, participants would express a weaker desire for closer proximity when 'close' to

as opposed to ‘far’ from the confederate. However, it was predicted that, in line with SCT principles, participants in the in-group conditions would express a greater desire for closer proximity than would participants in the out-group conditions. In line with study 3 and consistent with SCT, it was again predicted that participants in the out-group-‘close’ condition would express the weakest desire for closer proximity, whereas desire to be closer to the confederate would be highest for participants in the in-group-‘far’ condition.

5.3.2 Method

5.3.2.1 Design

This study used a 2 (group context: in-group/out-group) x 2 (interaction distance: ‘near’/‘far’) between subjects factorial design.

5.3.2.2. Participants

The current study was advertised via email to undergraduate students from the University of Sussex. They were offered either £3 or course credits in exchange for their participation. Sixty female participants whose ages ranged from 18 to 45 ($M = 20.88$, $SD = 4.19$) took part in the study. A male undergraduate psychology student worked as a confederate for the duration of the study.⁶

5.3.2.3 Dependent measures

Manipulation check (i): Identification: The three measures of identification used for study 1 in this chapter (from Ellemers et al., 1999) were also used for the current study. These items scaled together reliably ($\alpha = .78$) and were therefore combined to create a composite measure of identification.

Manipulation check (ii): Perceived difference of target to self: Again, the three measures of perceived difference used for study 3 were used for the current study. They scaled together ($\alpha = .61$) and were combined to create a single-score representation of perceived difference.

⁶ Although there are possible effects of male-female interactions on personal space (see Hayduk, 1983), it is felt that as the same confederate was used for the duration of the study, any between-condition variations on the dependent variables will be due to the experimental manipulations, and not the confederate’s gender.

Dependent variable (i): Subjective positive experience: Four of the measures used by Fenn (2006), plus one additional item (which was designed for the current study) were used. The items, which were anchored by 1 (*'not at all'*) and 7 (*'very much so'*) were as follows: *'I enjoyed taking part in the interview'*, *'I felt at ease during the interview'*, *'I would be willing to take part in a follow-up study at a later date'*, *'I felt relaxed during the interview'*, *'I had difficult relaxing during the interview'* (later reversed), and *'I felt uncomfortable during the interview'* (later reversed). These items were found to have a good level of internal consistency ($\alpha = .86$) and were therefore combined.

Dependent variable (ii): Subjective affective experience: Three items were used to measure participants' affective response during their interaction with the confederate. The items were taken from the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). It was felt that the complete version of the PANAS was perhaps inappropriate as items measuring affective dimensions such as inspiration, guilt, and attentiveness, would not be relevant. Therefore, the affective dimensions that were felt to be most appropriate for a novel context (excitement, interest, and nervousness) were included. The item relating to nervousness was reverse scored. In order to retain consistency with the subjective positive experience measures, the scales ranged from 1 (*'not at all'*) to 7 (*'very much so'*), as opposed to the 1-5 response scale used in the PANAS. Cronbach's alpha approached an acceptable level for these items ($\alpha = .59$).

Dependent variable (iii): Desired proximity: Two items were used to assess the extent to which participants wished to be seated closer to the confederate. The first simply read: *'I would have preferred to have been sitting closer to the other participant'*, whereas the second, which was later reverse scored was: *'I would have preferred to have been sitting further away from the other participant'*. Both items were on scales from 1 (*'not at all'*) to 7 (*'very much so'*). These items scaled together reasonably well ($\alpha = .66$) and were combined to produce a composite measure of desired proximity.

5.3.2.4 Procedure

The experimental paradigm used for this study was similar to that used for study 3, although there were some alterations due to the presence of the confederate. In an attempt to prevent participants from becoming suspicious, the confederate arrived at the laboratory after the participants. Participants (and the confederate) were informed of the differences between the two cognitive categories (represented by the colours red and blue) on a range of cognitive categories, and told that the current study was being conducted to assess the social performance of category members when interacting with a member of either their own or the other cognitive category.

Participants were told that category membership was determined by performance on a range of numerical and social estimation tasks (the dot patterns and typicality measures used in the previous studies; see Appendix 3). When the participants had completed the tasks, they were asked to follow the instructions provided, which would allow them to assess which of the cognitive categories they belonged to. To do so, each participant was instructed to perform a series of calculations derived from their answers to the estimation tasks. They were instructed that a final score below 750 was indicative of membership of the category represented by the colour blue, whilst a score exceeding 750 indicated that they belonged to the category represented by the colour red. This 'self-assessment' was used to prevent the participants becoming suspicious of the allocation to categories. Depending on which category they 'belonged' to, participants were asked to wear either a red or blue badge in an attempt to strengthen identification (as the manipulation of identity was weak in the previous study).

The confederate waited for the participants to announce which group they belonged to, and then depending on the randomly assigned group context of the interaction, he declared his category membership (as either an in-group or out-group member). At this stage, the participant and the confederate were informed that they would be having a 'social interaction' (in the form of a role-play interview) with each other in an adjacent room. They were told that the interview would be about a short piece of music. Allocation to the roles of interviewer and interviewee appeared to be random, but was fixed so that the confederate was always the interviewer.

Having been assigned to the roles, the confederate was handed a written instruction sheet (a series of questions relating to the music), and instructed to take a seat on a specific chair in the adjacent room. The participant was handed a separate instruction sheet (simply stating that she would be asked some questions relating to a piece of music) and asked to take a seat on a second chair. The chairs were set up either 'close' to, or 'far' from each other. As was the case in study 3, the distances were derived from those obtained in Chapter 4, study 1. For the 'close' condition, the mean in-group distances from Chapter 4, study 1, minus one standard deviation and an additional ten inches was calculated. For the 'far' condition, the mean out-group distance from Chapter 4, study 1, plus one standard deviation and an additional ten inches was used. The additional ten inches at both distances was used to make the distances more 'extreme' to establish whether the use of more 'extreme' distances strengthened the impact of group context on participants' experience.

Having listened to a piece of music for one minute, the confederate asked the participants several questions about the piece of music (e.g., 'How long do you think the piece of music lasted for?' and 'Which instrument was most prominent?'). When the questioning was complete, the participant and the confederate were asked to complete a questionnaire containing the measures of interest. Participants were then debriefed.

5.3.3 Results

5.3.3.1 Manipulation checks

Identification: As the mean score on the composite measure of identification was near to the mid-point of the scale (4) ($M = 4.02$, $SD = 1.09$), $t(59) = 0.18$, $p = .88$ (ns), which ranged from 'not at all' to 'very much', it can be suggested that the minimal identity was neither strongly accepted, nor rejected. Hence, as was the case in the previous study, the manipulation of identity was not as effective as intended. Importantly, there was no difference in identification between those interacting with in an in-group member ($M = 4.02$, $SD = 0.93$) and those interacting with an out-group member ($M = 4.02$, $SD = 1.25$), $t(58) = 0.00$, $p = 1.0$.

Perceived difference of target to self: There was no difference in perceived difference to self for those in the in-group ($M = 4.08$, $SD = 0.92$) and

out-group ($M = 4.04$, $SD = 0.83$) conditions, $t(58) = 0.15$, $p = .88$, $r = .02$, which raises some concern regarding the extent to which group context was successfully manipulated, at least based on the self-report measures.

5.3.3.2 Experience measures: Main effects and interactions

Table 5.2

Means and standard deviations for participants expecting discussion with an in-group or out-group members at 'close' or 'far' interaction distances (study 4).

Dependent variable	Experimental condition			
	In-group	In-group	Out-group	Out-group
	'Close'	'Far'	'Close'	'Far'
Subjective positive experience				
M	5.01	5.31	4.56	5.20
SD	0.80	1.30	1.44	1.11
Subjective affective experience				
M	4.40	4.62	3.73	4.02
SD	1.07	1.32	1.00	1.15
Desired proximity				
M	3.57	4.27	2.93	4.93
SD	1.18	0.73	1.12	0.70

Note: desired proximity relates to participants' desire to be closer to their discussion partner.

The means and standard deviations for the three dependent variables (subjective positive experience, subjective affective experience, and desired proximity) are displayed in table 5.2. A 2 x 2 multivariate analysis of variance (MANOVA) examined the effects of group context and interaction distance on the dependent variables. Pillai's trace did not reveal a significant multivariate main effect for group context, $F(3, 54) = 1.68$, $p = .18$ (ns), $\eta^2 = .09$, although

this effect reaches marginal significance with a two-tailed test ($p = .09$). Pillai's trace was found to be significant for interaction distance, $F(3, 54) = 10.09$, $p < .001$, $\eta^2 = .36$, and the interaction between the two independent variables reached marginal significance, $F(3, 54) = 2.40$, $p = .08$, $\eta^2 = .12$.

Separate ANOVAs were conducted on each of the dependent variables to investigate these effects further. Starting with participants' subjective positive experience, contrary to expectations, there was no effect of group context, $F(1, 56) = 0.84$, $p = .36$ (ns), $\eta^2 = .02$, or interaction distance, $F(1, 56) = 2.32$, $p = .13$ (ns), $\eta^2 = .04$ (although this p -value would have approached significance with a one-tailed test). There was no interaction between group context and interaction distance for this dependent variable, $F(1, 56) = 0.32$, $p = .57$ (ns), $\eta^2 = .01$.

For the second dependent variable – positive affective experience – in line with expectations, there was a significant effect of group context, $F(1, 56) = 4.61$, $p = .04$, $\eta^2 = .08$, which perhaps explains why the MANOVA results were suggestive of an overall effect of group context (albeit rather weakly). As predicted, participants who interacted with an in-group confederate reported higher levels of positive affect than did participants who interacted with an out-group confederate. There was no effect of interaction distance on affect, $F(1, 56) = 0.75$, $p = .39$ (ns), $\eta^2 = .01$. It was hypothesised that the effect of group context on subjective affect would be stronger when the interaction distance was 'close' as opposed to 'far'. However, the interaction between the independent variables was not significant, $F(1, 56) = 0.01$, $p = .91$, $\eta^2 = .00$.

Finally, as expected, analysis of variance revealed a significant effect of interaction distance on participants' desire to be closer to the confederate, $F(1, 56) = 29.88$, $p < .001$, $\eta^2 = .35$, with participants in the 'far' conditions expressing a stronger desire to be closer than participants in the 'close' conditions. Although a main effect of group context on desired proximity was expected, this was not supported, $F(1, 56) = 0.01$, $p = .95$, $\eta^2 = .00$. There was however a significant interaction between group context and interaction distance on participants' proximity preference, $F(1, 56) = 6.93$, $p = .01$, $\eta^2 = .11$. Simple effects analysis reveals that as a result of this interaction, when participants had interacted with the confederate at close proximity, those in the out-group condition expressed a marginally significantly weaker desire for

closer proximity than did participants in the in-group condition, $F(1, 56) = 3.29$, $p = .07$. This result was expected and supports a SCT approach to the experiential dimension of 'personal space'. However, rather unexpectedly, when the interaction distance was 'far', participants in the in-group condition expressed a marginally significantly weaker desire to be closer to the confederate than did those in the out-group condition, $F(1, 56) = 3.64$, $p = .06$.

5.3.4 Discussion

The current study was conducted to further investigate the impact of group relations on participants' experience of close physical proximity, using an alternative experimental design to that used in study 3. In line with Fenn's (2006) pilot study, participants interacted at either a 'near' or 'far' distance with a confederate who was framed as either an in-group member or an out-group member. It was found that the group context of the discussion and the distance at which it took place did not have significant effects on participants' subjective positive experience. There was, however, a significant effect of group context on participants' subjective affect. As predicted, participants who had interacted with an in-group member reported higher levels of positive affect than those who had interacted with an out-group member. Contrary to expectations, interaction distance did not have a significant impact on participants' subjective affect. Thus, whilst these findings suggest that group relations can impact upon the way we feel when we interact with a person with whom we have no history of interaction, they tell us little about the way in which physical distance can influence this relationship between psychological proximity and the way we feel.

However, it was found that in line with earlier findings (this chapter, study 3; Chapter 4, studies 1 and 2; Novelli et al. 2010, study 1), participants' desire for closer proximity varied as a function of group relations. When participants were asked to interact at close proximity to the confederate, those in the in-group condition expressed a stronger desire for closer proximity than did those in the out-group condition. As desired proximity is suggestive of participants' level of comfort, it can be seen as a proxy measure of experience, and as such, this finding at least points to the idea that unavoidable close proximity to an out-group member – someone defined as other – is more likely to be experienced

negatively (because it is a violation of the self-other boundary) than close proximity to an in-group member – someone defined as self.

In contrast to expectations, and in contrast to the findings of the first study in this chapter, the opposite effect was found when the interaction distance was 'far'. Participants in the out-group condition expressed a marginally significantly stronger desire for closer proximity than did those in the in-group condition. This finding is not easily explained and can only be interpreted speculatively. One possible explanation could be that participants may have felt awkward and uncomfortable when they were (a) told that they belonged to a different cognitive group to the confederate, and (b) were then asked to interact at an unusually far distance from him. As a combined result of this imposed psychological distance and anti-normative physical interaction distance, participants may have been more likely to attempt to minimise the discomfort that they had just experienced by stating that they would have preferred to have been seated closer.

Although the design of this study was an improvement on that used by Fenn (2006), it did have some slight weaknesses, which require some acknowledgement. First, the confederate was aware of the condition to which the participants were assigned, thus opening the study to the criticisms that that the confederate's behaviour may have led the participants to display demand characteristics. Ideally, both the confederate and the participant would have been unaware of the experimental context. However, such a design would have been difficult to administer when the study's objectives are considered. For example, participants were asked to wear group badges in an attempt to enhance the salience of the minimal group identities and hence the group context of the interaction. This would not have been possible if the confederate was unaware of the condition to which participants had been assigned. It was also felt that the experimental cover story would be more believable if participants were able to self-assess their category membership (and believe that the confederate was doing the same thing) rather than both the participant and confederate being assigned to a group by the experimenter, which may have aroused some suspicion. As none of the participants became aware of the deception involved in the study, this technique proved to be a success.

Whilst it is important to acknowledge this potential criticism of the study design, it is also important to stress that this issue is not simply an afterthought. As the study was designed with this issue in mind, it was carefully planned to ensure that there was little opportunity for the confederate to adapt his behaviour depending on the condition – i.e., so that he did not act in a friendlier manner or appear to be more approachable to in-group members than to out-group members. The entire interaction between the confederate and the participants was fully scripted from beginning to end. The confederate was asked not to go beyond the script, and to ensure that his behaviour was consistent across all trials.

The second potential weakness relates to the measures of affect. The affect scale was based on two measures of positive affect and one measure of negative affect, which was later reversed. These three items were combined to produce a measure of 'positive affect'. However, with hindsight, it is clear to see that an even number of positive and negative items, each feeding into separate tests of positive and negative affect would have provided much clearer, more accurate, and more reliable tests of affect. Therefore, in order to probe further the possible impact of group relations on subjective affect that was hinted at in this study, future researchers should consider using better measures of both positive and negative affect.

5.4 General discussion

The two studies presented in this chapter offer limited support to a SCT approach to the experiential dimension of 'personal space'. In study 3, participants in minimal groups anticipated an interaction with either an in-group member or an out-group member at a 'near' or 'far' distance. Although marginal effects of interaction distance on affect emerged, the group context of the interaction did not have a significant effect on participants' subjective affective state. Study 4 used a similar design. However, rather than simply anticipating interaction and hence sitting next to an empty chair, participants interacted with a confederate who was framed as an in-group or out-group member. Participants' positive experience associated with the discussion did not differ across conditions. However, it was found that participants who had interacted with an in-group confederate reported higher levels of subjective positive affect

than did those who had interacted with an out-group confederate. However, as was the case in study 3, subjective affect did not vary as a function of interaction distance.

Although on the surface the studies presented in this chapter did not offer strong support for a SCT approach to the experiential dimension of 'personal space', they did provide further evidence to suggest a link between psychological and (desired) physical proximity – i.e., the behavioural dimension of 'personal space'. In study 3, participants in both the 'near' and 'far' conditions expressed a stronger desire to be closer to an in-group member than to an out-group member, whilst the same was found for participants in the 'near' condition in study 4. Not only do these findings lend further support to the results presented in Chapter 4 and also in Novelli et al. (2010, study 1), they also point to the suggestion that participants may have felt more comfortable with the thought of closer proximity to an in-group member than to an out-group member. In doing so, these findings provide some support to the hypothesised relationship between identity, group relations, proximity and experience.

This evidence in support of the SCT approach to the experiential dimension of 'personal space' is, however, weaker than predicted. As already noted, the self-report measures of experience did not vary as a function of the interaction between group context and interaction distance. This raises the question of why the laboratory studies discussed in the current chapter have tended to find strong support for the SCT approach to the behavioural, but not the (self-reported) experiential dimension of 'personal space'.

One possible explanation might lie with the contextual nature of the experiments. Firstly, the groups used were minimal (and in fact the manipulations of group context were weak) and therefore relatively meaningless to the participants. It could be that proximity to in-group and out-group members in socially meaningful contexts, where there is a history of interaction, might be more emotive for those involved. Secondly, while the interactions in study 3 were only anticipated (they did not actually take place), the interactions with a confederate in study 4 were only on a one-to-one basis. As such, any 'personal space' violations in the out-group condition, or close proximity to someone who was perceived as a part of self in the in-group condition, would have only involved one person. While this may have been enough to evoke

variations in spatial preferences (as was the case in Chapter 4), it may not have been enough to evoke an affective response. However, in a dense crowd, close proximity would be to several other people. If those other people were out-group members, a perceiver's 'personal space' would be violated by several 'others', and from all directions – from in front, behind, and to the sides. It would therefore be expected that the negative experience associated with 'personal space' violations would be greater when the violations are made by many others, as opposed to just one. Likewise, if the others present in the crowd were in-group members, close proximity would not be solely to one other person perceived as self, as it was in the laboratory studies described in the previous chapter. Instead, the perceiver would be surrounded by several people who would be defined as self, and as a result, any potential positive feelings of warmth, comfort or intimacy, and so on, that might come from proximal relations to those defined as self, would be magnified.

With these issues in mind, the chapters that follow will begin to investigate the impact of identity processes and group relations on the behavioural and experiential dimensions of 'personal space' and crowding in situations that go beyond one-to-one interactions, starting with an investigation of exposure to density in imagined crowds in the studies presented in the following chapter.

Chapter 6: Psychological responses to imagined crowding

6.1 Introduction

The preceding chapters have provided some support for a SCT approach to behavioural variations in 'personal space', and hence provide a partial theoretical explanation of variable responses to crowding. Specific evidence for this support comes from the observation that participants (1) sought closer physical proximity to in-group members than to out-group members when given freedom to choose an interaction distance, and (2) expressed a stronger desire for close proximity to in-group members than to out-group members when the interaction distance was fixed. These variations in actual and desired physical proximity were attributed to the variable nature of self-other relations described by SCT. In short, SCT suggests that when a person is depersonalized (self-categorized according to a social identity), other in-group members are perceived as a psychological extension of self, whereas out-group members are perceived as separate from self. That is, they are perceived as 'other'. It has been hypothesised in this thesis that this increased psychological proximity to in-group members and psychological distance from out-group members should be reflected in our preferences for physical proximity to them. This hypothesis has been supported.

However, it is also important to underline the fact that these *behavioural* variations in proximity seeking behaviours are not simply a physical phenomenon. Whether someone wants to be near to, or far from another person or group of people, should be seen as a reflection of comfort, which is a psychological construct – an *experiential* construct. Indeed, the traditional approach to 'personal space' and its application to crowding (see Chapter 2, section 2.6), explicitly linked behaviour and experience when it proposed that physical violations of 'personal space' (the self-other boundary) in crowds should be experienced negatively. An SCT approach to 'personal space' and crowding would follow the same line of reasoning. However, SCT predicts that the perception of close proximity (in one-to-one interactions, small groups, and most importantly, in large crowds) as a violation of the self-other boundary will depend on how we categorize ourselves, and whether others around us in a

crowd are in fact perceived as self or other. When close physical proximity is on an interpersonal level, or to one or more out-group members (i.e., other/s), the perceiver's 'personal space' will be violated, and the resulting experience might be one of discomfort, annoyance, hostility, and so on. However, when close physical proximity is to one or more in-group members (i.e., self), there will be no violation of so-called personal space, and as such, rather than experiencing the negative consequences such as those listed above, perceivers may in fact experience the close proximity positively – as warm, enjoyable, or even exciting.

In the preceding chapters, the traditional approach to 'personal space' was criticised for overlooking such potential for close proximity to be experienced positively, and instead focussing on when it might evoke negative or neutral responses. Therefore, if the above hypothesis is supported, one of the major weaknesses inherent in the traditional approach to 'personal space' will have been addressed.

The studies discussed in Chapter 5 were designed to address this very issue. It was predicted that participants who were asked to interact at close proximity to an in-group member would report higher levels of positive affect than those asked to interact with an out-group member, while the opposite pattern was expected for subjective negative affect. While the studies provided some evidence in support of group relations impacting upon the experience of proximity (insofar as participants wanted to be seated closer to in-group members than to members of an out-group) there were only limited variations in the self-reported measures of affect.

It was speculated that these limited findings might have been due to the contextual nature of the experiments, and in particular, the fact that (a) the social groups were minimal (and hence, novel and relatively meaningless to the participants), and (b) the interactions and anticipated interactions were with just one other person. As such, any subsequent welcome or unwelcome close proximity would have been to one person, and from only one angle, rather than to many people and from several angles, as would be the case in small groups or large crowds (see Chapter 5, section 5.4 for a more detailed explanation). It can therefore be predicted that any experiential effects of close proximity may

be more pronounced in larger, more realistic crowds or situations of physical density.

The current chapter can be seen as an initial test of this hypothesis. However, the potential link between physical and psychological proximity in physically co-present crowds will not be examined until the following chapter. This chapter will focus on whether the hypothesised relationship between social identity, physical proximity and affective responses to crowding will emerge when the presence of others is simply imagined.

Previous work has indicated that psychological phenomena, which are usually associated with physical co-presence in groups and crowds, can also emerge when those groups or crowds of people are visualised. For example, Garcia, Weaver, Moskowitz, and Darley (2002), demonstrated that the bystander effect (Darley & Latané, 1968, Latané & Darley, 1968) – where helping behaviour is inhibited by the presence of others – occurred after participants were asked to imagine being immersed in a group, an effect that Garcia et al. (2002) called the implicit bystander effect.

In their first study, Garcia et al. (2002) asked participants to imagine eating dinner at a restaurant with one friend or with thirty friends. Participants were then asked to estimate how much money they would donate to charity in a hypothetical scenario. It was found that participants who had imagined being with one friend donated more money than those who had imagined being with thirty friends, or those who were asked to estimate their charitable donation in a control condition (where there was no mention of dining out at a restaurant). This effect was replicated when participants imagined being with a friend in either (a) an empty cinema, or (b) a crowded cinema, surrounded by strangers. Those who had visualised the crowded scenario pledged less money to the hypothetical charity than did those who had imagined being seated with just their friend. Indeed, these effects also emerged when the helping behaviour was real. When asked to state how much time they would be willing to pledge to the experimenter by taking part in a separate experiment, participants who were previously asked to imagine being in a restaurant with ten friends were willing to give less time than those who had imagined being in a restaurant with just one friend, or those who had not been asked to visualise a restaurant scene at all.

These effects emerged even though the visualised group or crowd did not relate to the helping situation (i.e., imagining being in a crowded cinema or restaurant should have no bearing on the amount of time that people are willing to pledge to take part in psychological research). Garcia et al. (2002) claimed that rather than the context of the visualised situation per se impacting upon helping behaviour, participants who had imagined being in a large group or crowd became less self-aware and less accountable for their actions, and as a result, felt less inclined to offer help in a subsequent task.

Levine, Cassidy, and Jentsch (in press) observed that in making these claims, Garcia et al. were drawing on concepts that were central to deindividuation theory (cf. Zimbardo, 1970). As discussed at length in Chapter 3, in its original formulation, deindividuation refers to a situation whereby individuals immersed in groups or crowds experience anonymity – a loss of identity – and with this anonymity comes a sense of diffused responsibility or accountability, which in turn can lead to displays of anti-normative behaviour – such as not helping those in need. Thus, Garcia et al.'s suggestion that visualising immersion in a group of people – be they friends or strangers – diminished participants' desire to offer help, was to suggest that their apathy was an anti-normative consequence of deindividuation.

Levine et al. (in press) challenged Garcia et al.'s claim. They argued that rather than interpreting the implicit bystander effect in terms of the identity-loss that is central to the original formulation of deindividuation theory, it should instead be understood in terms of the principles that are central to the social identity approach to group and crowd behaviour. Specifically, they point to the social identity model of deindividuation effects (SIDE: e.g., Reicher et al., 1995), which suggests that immersion in a group or crowd can facilitate a shift from a personal identity to a more inclusive level of social identity, rather than a simple 'loss of self' to the collective (see Chapter 3, section 3.5.2 for more on the SIDE model). Following this shift, subsequent behaviour will reflect the norms associated with the relevant social identity and the contextual backdrop, as opposed to being anti-normative, as suggested by deindividuation theory. If this approach is correct, the priming of physical co-presence should not inevitably inhibit helping behaviour, as suggested by Garcia et al. (2002). Instead, helping

behaviour should sometimes increase – especially when helping is a normative action for a particular social identity, within a particular context.

Levine et al. (in press) adapted Garcia et al.'s (2002) experimental paradigm to test the social identity approach to implicit bystander effects. One of the major findings to emerge was that in replication of Garcia et al. (2002), the imagined presence of others could sometimes inhibit helping behaviour – e.g., when surrounded by ten or thirty friends as opposed to one friend in a restaurant, participants were less likely to pledge their time to help in a psychology experiment (a measure also employed by Garcia et al.). However, when the visualised scene involved students instead of friends, participants offered significantly *more* of their time (they were more helpful) as the number of people co-present increased. According to Levine et al. (in press), this effect can be explained in terms of the increased salience of the student identity that comes from visualising a large group of students as opposed to a small group. With this increased student identity salience comes an increased sense of commitment to the university, and hence, participants were more likely to offer more of their time to the university's Psychology Department. Levine et al. therefore demonstrated that the nature of helping behaviour that follows the imagined immersion in a crowd is variable, and operates as a function of social identity processes.

While these findings divert slightly from the issues that are central to this chapter, they demonstrate that Garcia et al.'s paradigm is robust. That is, regardless of the nature of helping behaviours that were observed following the imagined immersion in a crowd, the fact is that psychological phenomena usually associated with physical co-presence emerged when the presence of others was simply imagined. This finding opens up an interesting avenue for the current body of work. If, as predicted, social identity processes can impact upon our experience of close proximity in crowds, and more specifically, on our affective response to such close proximity, then it is possible that these effects will also emerge when immersion in a crowd is imagined. This line of reasoning forms the basis of the two studies that will be described below.

6.2 Study 5

6.2.1 Overview

This study uses an adapted version of the Garcia et al. (2002) paradigm to test whether affective responses to imagined close physical proximity in crowds operate as a function of context, and more importantly, as a function of the extent to which participants identify with those in the imagined crowd scenarios. It has been highlighted previously that the traditional ‘personal space’ approach to crowding cannot account for why crowding might be experienced differently *within* a specific location. One example of this is on a busy train carriage. As already discussed in this thesis (see Chapter 3, section 3.5.3), close proximity to strangers on a busy train carriage might be expected to evoke a negative affective response when those strangers are perceived as ‘other’ – e.g., when the train is filled with commuters on their way to work – a context in which cues to a shared social identity might be sparse. However, if contextual variables were to act as cues to a shared social identity, those same strangers might be perceived as in-group members – as a part of self. Examples include fellow supporters of a football team, co-protestors returning home from a demonstration, or fellow fans of a particular band. Accordingly, any close proximity might give rise to a positive affective response.

Therefore, a train carriage will be used as the backdrop to the visualised scenarios in the current study. Participants will be asked to imagine being (a) alone on an empty carriage (no crowd), (b) surrounded by commuters on a packed carriage while on their way to work (interpersonal/no social identity crowd), or (c) surrounded by fellow fans of their favourite band on a packed train carriage having seen the band play a concert. The hypotheses are as follows: with regards to negative affect, and in line with the theoretical propositions outlined above and in Chapter 3, it is predicted that mean subjective negative affect will be higher for participants who visualise close physical proximity to commuters than for participants who visualise being either on an empty carriage or surrounded by in-group members. This is because the first scenario involves a breach of the self-other boundary, whereas the latter two do not. There is no reason to believe that negative affect will vary between those who visualise the empty carriage and those who visualise being surrounded by in-group members. With regards to positive affect, it is predicted

that mean subjective positive affect will be higher for participants who visualise close physical proximity to people who they perceive as an extension of self (those who imagine being surrounded by fans of their favourite band) than it will be for participants who visualise either being alone on the carriage or being surrounded by commuters (those perceived as other). It is difficult to make a clear prediction regarding potential differences in positive affect between the no crowd condition and the interpersonal (commuter train) condition. On the one hand, it could be predicted that as neither scenario involves close physical proximity to those defined as self, there will be no variation in positive affect. On the other hand, however, it could be suggested that close proximity to those defined as other might lead to lower levels of positive affect than imagining being alone. Therefore, this part of the analysis should be seen as exploratory.

6.2.2 Method

6.2.2.1 Design

There were three levels to the independent variable (visualisation context): no crowd, commuter crowd (interpersonal context condition), and concert reveller crowd (in-group crowd).

6.2.2.2 Participants

Undergraduate psychology students were contacted via email and offered the opportunity to take part in the study in exchange for course credits. Sixty participants, with an age range of 18 to 44 ($M = 20.00$, $SD = 5.00$) returned a completed copy of the materials and were therefore included in the final sample. Of the final sample, 56 were female and 4 were male.

6.2.2.3 Dependent measures

Manipulation check (i): Identification: For participants who had imagined being on the train carriage in the in-group and interpersonal contexts, identification with fellow crowd members was measured using three items. Two were adapted from Ellemers et al. (1999) and were as follows: '*I identified with the other people who were present on the train in my visualisation*', and '*I am like the other people who were present on the train in my visualisation*'. The third item – '*I felt strong ties with the other people who were on the train in my*

visualisation' – was adapted from Ellemers, Spears, and Doosje (1997). These items were not included for participants in the 'no crowd' condition. As these items scaled together extremely well ($\alpha = .93$), their mean score was calculated and used to represent participants' identification with other crowd members.

Manipulation check (ii): Perceived difference of self to other crowd members: Perceived difference was measured using a single item, which was designed for the purpose of this study: *'In my visualisation, the other people on the train were different types of people to me'*. Again, this item was included in the questionnaire completed by participants in the in-group and interpersonal conditions, but not by participants in the 'no crowd' condition.

Manipulation check (iii): Visualisation clarity: Participants' ability to visualise the scenarios was assessed using two items which were designed for the purpose of this study. These items were as follows: *'I found it easy to imagine being on the train'*, and *'When visualising the train, I could imagine the carriage in great detail'*. These items scaled together well ($\alpha = .74$) and were combined to obtain a composite measure of visualisation clarity.

Dependent variable: Subjective affective experience: As was the case in Chapter 5, study 1, participants' subjective levels of positive and negative affect were measured using the Positive and Negative Affect Schedule (PANAS) (Watson et al., 1988) (see appendix 5). The positive items ($\alpha = .83$) and the negative items ($\alpha = .83$) each scaled together well. Accordingly, the ten items on the positive scale were summed to provide a single-score representation of positive affect, whereas the ten items on the negative scale were summed to provide a single-score representation of negative affect. Higher scores indicate more positive mood and more negative mood, respectively.

6.2.2.4. Procedure

In line with Levine et al. (in press), prospective participants were invited to take part in what they were led to believe was a study investigating how images are conjured in the mind. Having expressed an interest in taking part in the current study, prospective participants were sent a consent form via email. When participants had completed and returned the consent form, they were forwarded a copy of the study materials. As there were three levels of the independent variable, three versions of the materials were used. Participants were assigned

to conditions on a random basis and then sent the pack of materials that corresponded with the condition they had been assigned to. Participants were instructed to work through the pack of materials in the order in which they were presented, and to complete the questionnaire alone. Participants were then provided with instructions to the visualisation task, which were as follows:

Below you will find a scenario. Please read through it carefully and then imagine yourself in that scenario. You should really try to imagine that you are there. If you find it easier to close your eyes to do this, then feel free to do so. Visualise the scenario in as much detail as possible. When you feel as though you have visualised the scenario in as much detail as possible, please turn over and take a couple of minutes to write down anything from the visualisation that you think might be important.

Participants in each of the conditions were then asked to imagine that they were travelling on a train carriage. In the 'no crowd' condition, the scenario was as follows: *'...you are standing in a train carriage. You are on your way to work and the train is empty. There are no people in front of you, behind you, or to your sides'*. In the 'in-group crowd' condition the scenario was: *'... you are standing in a crowded train carriage. You are part of a group that has just been to see your favourite band play a concert. The train is packed full with fellow fans of your favourite band. There are people in front of you, behind you, and to your sides'*, whereas the scenario in the interpersonal condition was: *'...you are standing in a crowded train carriage. You are on your way to work and the train is packed full with commuters, also on their way to work. There are people in front of you, behind you, and to your sides'*.

When participants had made notes on their visualisation, they were prompted to complete the PANAS. Finally, participants completed the measures of social identity and perceived difference (in the in-group and interpersonal conditions), as well as the measures of visualisation clarity (in all conditions). When the study materials had been completed and returned to the researcher, participants were sent a full debrief, via email.

6.2.3 Results

6.2.3.1 Manipulation checks

Identification: One-sample t -tests revealed that mean identification was significantly higher for participants who had imagined being in a crowded train carriage in an in-group context ($M = 5.42$, $SD = 1.12$) than for those who had imagined being in a crowded carriage in an interpersonal context ($M = 3.33$, $SD = 1.41$; $t(19) = -2.11$, $p = .05$). This suggests a successful manipulation of identification.

Perceived difference of self to other crowd members: An independent t -test revealed that the mean scores for participants in the interpersonal and in-group conditions on the item designed to measure perceived difference were different, to a highly significant degree, $t(38) = 3.45$, $p = .001$. As intended, participants who had visualised the crowded train carriage in an interpersonal context perceived fellow crowd members to be more different from self ($M = 4.75$, $SD = 1.77$) than did participants who had visualised the in-group crowd ($M = 2.90$, $SD = 1.62$).

Visualisation clarity: Analysis of variance (ANOVA) revealed that between-condition differences in visualisation clarity were not significant, $F(2, 57) = 2.35$, $p = .10$ (ns), $\eta^2 = .08$. Therefore, any potential main effects can be attributed to the experimental manipulations as opposed to variations in participants' ability to visualise the scenarios. The mean visualisation clarity scores were significantly above the mid-point of the scale for participants in all three of the conditions (control condition $M = 5.17$, $SD = 1.21$, $t(19) = 4.36$, $p < .001$; interpersonal context condition $M = 5.70$, $SD = 1.21$, $t(19) = 6.30$, $p < .001$; in-group context condition $M = 6.03$, $SD = 1.33$, $t(19) = 6.80$, $p < .001$). This suggests a good degree of visualisation clarity for participants in each of the conditions.

6.2.3.2 Dependent variables: Main effects

Table 6.1

Means and standard deviations for participants who visualised a train carriage in no crowd, interpersonal crowd, and in-group crowd contexts.

Dependent variable	Experimental condition		
	No crowd	Interpersonal context	In-group context
Positive affect			
<i>M</i>	25.25	24.20	28.90
<i>SD</i>	1.49	1.49	1.49
Negative affect			
<i>M</i>	14.70	17.85	14.55
<i>SD</i>	1.14	1.14	1.14

Subjective affective response: Table 6.1 shows the mean scores and standard deviations for the two dependent variables (subjective levels of positive and negative affect). A one-way multivariate analysis of variance (MANOVA) was conducted to assess the effect of the independent variable (visualisation context) on these dependent variables. In order to retain consistency with Chapter 5, Pillai's trace was used to test the multivariate effects. This yielded a significant result, $F(2, 56) = 2.48, p = .05, \eta^2 = .08$. Separate one-way analyses of variance (ANOVAs) were therefore conducted on each of the dependent variables to further investigate this significant multivariate effect.

Starting with subjective positive affect, there was a marginally significant difference between the conditions, $F(2, 57) = 2.76, p = .07, \eta^2 = .09$. Planned contrasts revealed that as predicted, mean positive affect was marginally significantly higher for participants who had visualised being on a train carriage when immersed in an in-group crowd compared to those who had visualised being immersed in a crowd in an interpersonal context, or on an empty carriage, $t(57) = -2.29, p = .03, r = .32$. There was no difference in mean positive affect between participants who had imagined the empty train carriage and those who

had visualised being immersion in a crowd in an interpersonal context, $t(57) = -0.50$, $p = .62$ (ns), $r = .06$.

Analysis of variance (ANOVA) also revealed a marginally significant between-condition difference in subjective negative affect, $F(2, 57) = 2.67$, $p = .09$, $\eta^2 = .09$. Again as expected, planned contrasts revealed that mean negative affect was higher for participants who had visualised the crowded commuter train (interpersonal context) compared with those who had visualised the empty train carriage, or those who imagined being immersed in a crowd of in-group members, $t(57) = -2.31$, $p = .03$, $r = .32$. There was no difference between the no crowd condition and the in-group crowd condition in their mean levels of subjective negative affect, $t(57) = -0.09$, $p = .93$ (ns), $r = .01$.

6.2.4 Discussion

The primary hypotheses for study 5 were supported. First, negative affect was significantly higher for participants who had visualised immersion in a commuter crowd than it was for those who had visualised standing on an empty train carriage, or those who had imagined being immersed in an in-group crowd. According to a SCT interpretation, this is due to the violation of the self-other boundary in the commuter crowd condition – a violation that was absent from the other two scenarios, and as a result, participants in these conditions did not show a difference in their subjective negative affect. With regards to the second dependent variable – positive affect – participants who had imagined being on a crowded train carriage, surrounded by in-group members, subsequently reported higher levels of positive affect than did those who had visualised being on either an empty train carriage, or surrounded by a group of commuters, with whom identification was low. In line with SCT, it is suggested that this effect was due to participants in the in-group condition visualising close physical proximity to people who would be perceived as a part of self. As a result, even though the others co-present were strangers (just as they were in the commuter crowd condition) their close proximity would be welcomed and enjoyed. No clear predictions were made regarding potential differences in positive affect between the no-crowd and commuter crowd conditions. On the one hand, it was suggested that there should be no difference between participants in these conditions, as neither group would be imagining close proximity to those defined

as self. On the other hand, it was predicted that positive affect might be lower for those who had visualised the commuter carriage, as they would have imagined close proximity to people perceived as other. As no difference was found between these conditions, the first suggestion was supported.

This study lends further evidence to suggest that Garcia et al.'s (2002) paradigm is robust. In fact, it goes a step further by demonstrating that the imagined presence of others is not limited to subsequent helping behaviours – it can also impact upon our affective state. Most importantly, however, this study shows that with regards to imagined crowding, there is not a generic negative response to density and close proximity. It was not the case that simply imagining being surrounded by people in a crowd led to negative consequences. Instead, the type of crowd led to either an increase in positive affect or an increase in negative affect.

As already discussed in this chapter, it is hypothesised that these variable responses to imagined close proximity in crowds is due to variations in the extent to which participants identified with the others co-present in their visualisations. Although the manipulations of identity and difference were successful, it is impossible to be sure that identity processes were responsible for the variations in affect. This is due to the fact that other factors inherent in the scenarios could be seen as potential confounds. For example, the increased negative affect in the commuter scenario could have simply been a result of the participants thinking about being on their way to work, whereas the increased positive affect in the band scenario might have simply been a result of the participants thinking about seeing their favourite band, which might be associated with positive feelings.

One way of countering this suggestion would be to run a mediation analysis, with levels of identification and perceived difference as the proposed mediators between the experimental conditions and affect. However, seeing as participants in the 'no crowd' condition did not fill in measures of identification or difference, this is not a viable option. An alternative approach is to run a second study in which the backdrop of the visualisation scenario is held constant. That is, all participants could be asked to imagine exactly the same scene, and immersion in exactly the same crowd. This would then allow for an assessment of the extent to which natural variations in identification are

associated with (a) desired proximity in the crowd (with desire for greater distance being associated with greater discomfort), and (b) subjective affective response. As such, study two will take this correlational approach as it will help to verify that the variations in affect found in study 1 were due to identity processes, as opposed to potential confounds in the experimental design.

6.3 Study 6

6.3.1 Overview

Study 6 seeks to further examine the impact that immersion in a visualised crowd can have on participants' subjective affective state. The context of the visualisation will be held constant for all participants to allow for a stricter test of the relationship between social identification, crowding, and affect. A packed train carriage will be used as the backdrop for this study, as was the case for study 1. All participants will be asked to imagine that they are working as summer interns, and have been asked by their boss to attend an England football match at Wembley Stadium. They will be asked to imagine that on their way to the match, they find themselves on train carriage packed full with England supporters who are chanting loudly. They will be asked to imagine that they are in close proximity to the fans from the front, back, and to their sides. It is hypothesised that the extent to which participants identify with the other crowd members will be significantly positively correlated with their subjective levels of positive affect. In other words, as participants identify more with the others co-present, they will report higher levels of positive affect. It is also predicted that identification will be significantly negatively correlated with (a) subjective negative affect, and (b) desire for greater distance (desired proximity). In other words, as identification increases, participants will report lower levels of negative affect, and will require less 'personal space'.

Two mediation models will also be tested in the analysis for study 6. It is predicted that desired distance will be significantly positively correlated with negative affect and significantly negatively correlated with positive affect. That is, as participants wish to have more 'personal space' (feel less comfortable with close proximity to the other crowd members) they will feel, or at least report, higher levels of negative affect and lower levels of positive affect. At first glance, this hypothesis seems to be in line with the density-pathology

hypothesis that was discussed, and critiqued, in previous chapters. However, it is also predicted that social identification will mediate this proposed relationship. In other words, the relationship between close physical proximity in a crowd and (a) increased negative, and (b) decreased positive affect, will become non-significant when social identification levels are accounted for. This hypothesis is based on the assumption that close proximity will lead to these affective responses as participants' identification with those others co-present diminishes. So, as the crowd members are perceived as other to a greater extent, their close physical proximity will be seen increasingly as a violation of the self-other boundary, and as a consequence, participants will feel greater levels of negative affect and lower levels of positive affect.

6.3.2 Method

6.3.2.1 Design

A correlational design was used for the current study.

6.3.2.2 Participants

Fifty-three participants took part in the study. Their ages ranged from 18 to 48 ($M = 26.00$, $SD = 9.00$). Of the final sample, 34 were female and 19 were male. Participants were not paid for taking part in the study.

6.3.2.3 Measures

Manipulation check: Visualisation clarity: Visualisation clarity was measured using the same two items that were designed for study 5 (see section 6.2.2.3).

Variable 1: social identification: Social identification with the visualised crowd was measured using an adapted series of items compiled by Leach et al. (2008). Leach et al.'s identity scale is designed to measure five identity components: (i) group solidarity, (ii) identity centrality, (iii) individual self-stereotyping, (iv) perceived in-group homogeneity, and (v) identity satisfaction. However, only the items which are designed to measure identity centrality (3 items), group solidarity (3 items), and individual self-stereotyping (2 items) were used to measure social identification in the current study because these items look specifically at participants' identification with the crowd, rather than their perception of the crowd or their feelings associated with being in the crowd

(which might confound with the measures of affect). Therefore, the perceived in-group homogeneity items and identity satisfaction items were omitted from the scale. The final list of eight adapted items was: *'I will often think about the fact that I was amongst the people who I was with in my visualisation'* (adapted from Cameron, 2004), *'The fact that I was in the group of football fans in my visualisation is an important part of my identity'* (adapted from Luhtanen & Crocker, 1992), *'Being in the group of football fans in my visualisation is an important part of how I see myself'* (adapted from Doosje, Branscombe, Spears, & Manstead, 1998, Ellemers et al., 1999, and Luhtanen & Crocker, 1992), *'I felt a bond with the group of football fans who were in the train carriage with me in my visualisation'* (adapted from Cameron, 2004, and Doosje et al., 1998), *'I felt solidarity with the group of football fans who were in the train carriage with me in my visualisation'* (adapted from Leach et al., 2008), *'I felt committed to the group of football fans who were in the train carriage with me in my visualisation'* (Doosje, Ellemers, & Spears, 1995), *'I have a lot in common with the football fans who were on the train carriage with me in my visualisation'* (adapted from Spears, Doosje, & Ellemers, 1997), and *'I am similar to the football fans on the train carriage with me in my visualisation'* (Doosje et al., 1995, and Spears et al., 1997). Participants responded to these items using a seven-point Likert-type scale, which ranged from 1 (*'strongly disagree'*) to 7 (*'strongly agree'*). The items scaled together well ($\alpha = .88$) and were combined to obtain a composite measure of social identification with the crowd.

Variable 2: Desired distance: Three items of desired distance were designed for the purpose of this study, which were responded to on the same 7-point scale as the items above. They were: *'I would have preferred to have been standing further away from the football fans on the carriage in my visualisation'*, *'I would have preferred to have been standing closer to the football fans on the carriage in my visualisation'* (reverse scored), and *'I would have liked more space on the train carriage in my visualisation'*. As the response scale ranged from 1 (*'strongly disagree'*) to 7 (*'strongly agree'*), higher scores indicate a desire for more space. As there was a good level of internal consistency between the items ($\alpha = .71$) they were combined to obtain a single-score representation of desired distance.

Variables 3 and 4: Positive and negative affect: Participants' subjective positive and negative affect were measured using the PANAS (Watson et al., 1988). Again, the positive items ($\alpha = .78$) and the negative items ($\alpha = .81$) each scaled together well. Therefore, the positive affect items were summed to obtain a single-score representation of positive affect, whereas the negative items were summed to represent negative affect. Higher scores indicate higher levels of positive and negative affect.

6.2.3.4 Procedure

The procedure for study 6 is virtually identical to that of study 5. However, rather than contacting prospective participants by email, they were approached by the researcher outside the University of Sussex Library. The reason for approaching participants in person as opposed to via email was to ensure that each participant's data was independent (this is virtually impossible when materials are sent out and returned at a later date). Only people who were sitting alone were approached to ensure that participants did not confer with one another when completing the tasks. The researcher waited with each participant while they completed the measures, before fully debriefing them.

6.3.3 Results

6.3.3.1 Manipulation check

Visualisation clarity: A one-sample t-test revealed that the mean visualisation clarity score was above the mid-point of the scale, to a highly significant degree, $t(52) = 7.67, p < .001$. This suggests that participants were able to visualise the crowded carriage with a good degree of clarity.

6.3.3.2 Correlations

Table 6.1 shows the means and standard deviations for the four variables measured after the visualisation task. The correlations between these variables are also displayed. As can be seen, an increase in social identification with the England supporters on the train carriage was associated with higher levels of positive affect following the visualisation task. Social identification was also associated with a significantly reduced desire for greater physical distance from those present in the crowd as well as significantly lower levels of subjective

negative affect following the visualisation task. This therefore provides support for the first set of hypotheses that were outlined in section 6.3.1.

Table 6.2 Social identification, desired distance, and subjective affect:
Means, standard deviations and correlations

Variable			1	2	3	4
	<i>M</i>	<i>SD</i>				
1. Social identification	2.55	1.16	-	-.60***	.41**	-.53***
2. Desired distance	5.56	1.14		-	-.27*	.45**
3. Positive affect	26.79	6.67			-	-.40**
4. Negative affect	18.89	5.99				-

Note: * = $p < .06$, ** = $p < .01$, *** = $p < .001$

6.3.3.3 Simple mediation analyses

The simple mediation models presented below are assessed using the guidelines set out by Preacher and Hayes (2004). Preacher and Hayes's (2004) non-parametric bootstrapping approach is preferred to (a) the Baron and Kenny (1986) and (b) the Sobel (1982) methods for testing mediation effects, for the following reasons. As noted by Preacher and Hayes (2004), the Baron and Kenny (1986) method does not involve a formal significance test of mediation. Instead, it states that if the direct effect of the predictor variable on the outcome is zero when the mediator is included in the formula, perfect mediation has occurred. Baron and Kenny do point to the Sobel (1982) test as a way of assessing partial mediation, but it is not central to their own statistical approach. While the Sobel (1982) test could be used in combination with the Baron and Kenny (1986) approach in the current analysis, Preacher and Hayes (2004) note that the Sobel (1982) test is unreliable because it has low power when the sample size is small, it comes with an increased risk of both Type I and Type II errors, and it assumes that the distribution of the variables is normal – an assumption that is often not met in small samples. As the Preacher and Hayes (2004) method is non-parametric, it makes no such assumptions, and provides a more powerful test. It is therefore the preferred method for the

analyses that follow. The analyses will be based on 5,000 bootstrap samples and conducted using the SPSS macro devised by Preacher and Hayes (2004).

Model 1: Social identification as mediator of the relationship between desired distance and negative affect.

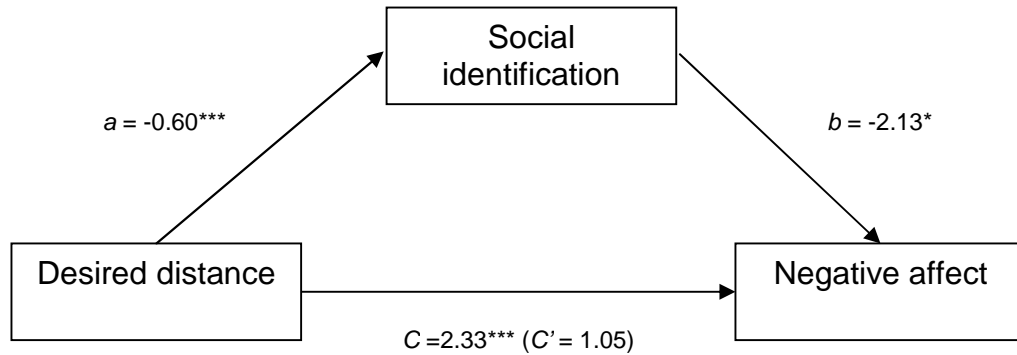


Figure 6.1. Social identification as a mediator of the relationship between desired distance and subjective negative affect. Values represent β weights * < .05 ** < .01, *** < .001.

Figure 6.1 shows the first simple mediation model. First, as stated in section 6.3.3.2, as participants' desire for greater distance from the crowd increased, there was a tendency to identify less with the crowd members. In addition, when controlling for desired distance, the proposed mediator, which was social identification, was significantly negatively correlated with negative affect. That is, higher identifiers tended to report lower levels of negative affect. With regards to the mediation analysis, the total effect of desired distance on negative affect was highly significant (depicted by path C). In other words, a desire for more space in the crowd was associated with higher levels of subjective negative affect. However, the direct effect of desired distance on negative affect when controlling for social identification (depicted by path C') is non-significant, which according to the Baron and Kenny (1986) approach, suggests full mediation. This view is supported by bootstrap analysis. The lower limit of the 99% bootstrap confidence interval for the indirect effect is 0.233, whereas the upper limit is 2.822. As this range does not contain zero, it suggests – with an extremely high degree of confidence – full mediation.

Model 2: Social identification as mediator of the relationship between desired distance and positive affect.

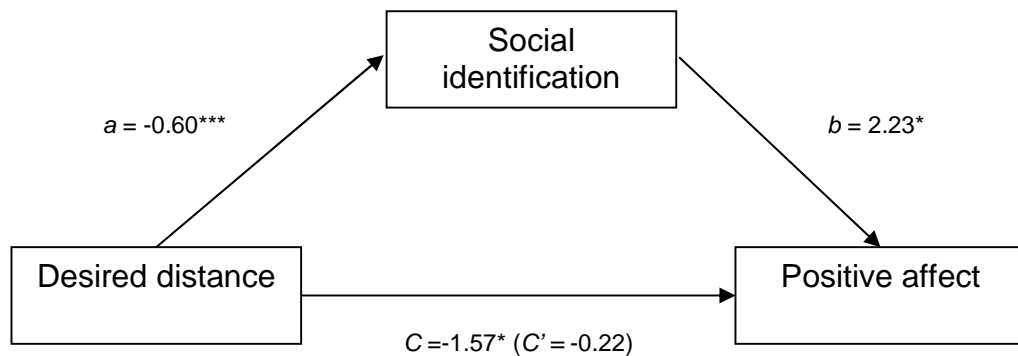


Figure 6.2. Social identification as a mediator of the relationship between desired distance and subjective positive affect. Values represent β weights * < .05 ** < .01, *** < .001.

The second simple mediator model is depicted in Figure 6.2. The only change from model 1 to model 2 is the outcome variable, which in this case is positive affect. The total effect of desired distance on positive affect (depicted by path C) is significant in a negative direction. This means that an increase in participants' desire for more space is associated with a decrease in subsequent levels of subjective positive affect. As mentioned previously, social identification (the proposed mediator) is negatively correlated with desired distance. When desired distance is held constant, social identification is positively correlated with positive affect: as identification with the crowd increases, so too does positive affect. The direct effect of desired distance on positive affect (depicted by path C') becomes non-significant when the mediator is included in the model. This suggests mediation according to the Baron and Kenny (1986) approach. The conclusion that social identification fully mediates the relationship between desired distance and positive affect is supported by the bootstrap analysis. The lower limit of the 95% confidence interval is -2.58, whereas the upper limit is -0.12, and therefore does not contain zero.

6.3.4 Discussion

The hypotheses for study 6 were supported. Having visualised immersion in a crowd of football supporters on a busy train, participants' desire for physical distance was related to the degree to which they identified with the crowd. To

be more specific, an increase in identification was associated with a lower desire for greater distance from the others present on the train. This supports an SCT approach to spatiality.

The primary motivation for conducting this study was to provide a stricter test of the impact that identity processes can have on participants' affective state following visualised immersion in a dense crowd. While identification varied between the conditions in study 1, as did subjective affect levels, it was impossible to rule out other aspects of the scenarios influencing these variations. In the current study, however, the backdrop to the physical proximity in the crowd was held constant. It was found that desired distance – or in other words, responses to physical density – were associated with participants' subsequent subjective affect; as participants wanted more space on the busy carriage, they reported higher levels of negative affect, and lower levels of positive affect. However, these effects became non-significant when participants' social identification with the crowd was held constant. In other words, the relationship between desired distance and affect depended on the extent to which participants identified with the England fans that were present in the visualisation. Those who wanted more space tended to identify less with the crowd (and therefore may have felt their close proximity to be a violation of the self-other boundary) and as a result reported higher levels of negative affect and lower levels of positive affect. Of course, due to the correlational design of this study, these findings could be interpreted as those who wanted less space tended to identify more with the crowd and may have therefore welcomed the close proximity of the England fans, and as a result, they felt higher levels of positive affect and lower levels of negative affect. Either way, it is possible to conclude that the findings of this study offer further support to a SCT approach to 'personal space' and responses to situations of crowding.

6.4 General discussion

The studies presented in this chapter offer strong support for a SCT approach to the imagined experience of close proximity in crowds. In study 5, participants reported higher levels of positive affect when they had imagined being on a train carriage surrounded by in-group members (when on the way home from a concert), and higher levels of negative affect when they had imagined being on

a crowded train carriage where there were no cues to a shared social identity (when on the way to work). In study 6, which used a correlational design, the contextual backdrop to the crowding scenario was held constant to counter any suggestion that variations in affect in study 5 might have been due to qualitative differences between the scenarios. It was found that participants' social identification with the crowd was correlated with their desired proximity to the crowd members. As identification decreased, desire for greater distance increased. This finding is in line with the SCT approach to 'personal space' that has been discussed in previous chapters – it demonstrates a relationship between psychological and physical distance. Importantly, a significant relationship between desired distance and affect was also uncovered. Participants who desired greater distance, and therefore felt more uncomfortable with the close proximity in the crowd, reported higher levels of negative affect and lower levels of positive affect. However, this effect was fully mediated by the extent to which participants identified with the crowd. This therefore supports the suggestion that the effect of close proximity on experience largely depends upon whether the close proximity is to those we identify with (who are defined as self) or those who we do not identify with (who are defined as other).

Not only do these findings lend further support for a SCT approach to spatiality and crowding, they also add further weight to the criticisms levelled at some of the earlier crowding theories discussed in Chapter 2. For example, the general density-pathology approach (e.g., D'Atri, 1975; Griffitt & Veitch, 1971; Insel and Lindgren, 1978) suggested that exposure to physical density should be associated with negative outcomes. This study has shown that to the contrary, with regards to imagined crowds at least, exposure to physical density can be associated with variations in both positive and negative outcomes. Similarly, as discussed at length in Chapter 2., the traditional 'personal space' approach to crowding could only account for when close proximity would be experienced neutrally or negatively, but said nothing about when it might be experienced positively. It also only provided a long list of intervening variables, which might influence these limited variations in personal space. These included broad group variables, such as culture (Hall, 1966), situational variables, such as whether an interaction takes place inside or outside

(Cochran, Hale, & Hissam, 1984), and interpersonal variables, such as whether close proximity is to a friend or a stranger (Sundstrom & Altman, 1976). In the current study, participants were all from the same cultural background (they were all British students), they all visualised a crowd in the context of a train carriage, and they all imagined close proximity to strangers. Therefore, the finding that proximity preferences still showed variations, and that there was variation in positive affect as well as negative affect, is problematic for the traditional approach to 'personal space'. Indeed, as alluded to above, the fact that desired proximity and affect were related to social identification, demonstrates again the benefits associated with a unified SCT approach to personal space and its application to crowding.

Before drawing this chapter to a close, it is important to be very clear with regards to the limitations of studies discussed. The studies were based on an adapted version of the Garcia et al. (2002) visualisation paradigm. Therefore, what the findings do show is that (a) the paradigm can be used to investigate a range of potential effects associated with physical co-presence – not just the bystander effect, and (b) that SCT principles can be applied to the experience of crowding, when the crowd is imagined. However, unlike the Garcia et al. (2002), and Levine et al. (in press) studies which used the visualisation technique to investigate an effect that had been previously examined out in the field, the current chapter used the visualisation paradigm to test the potential relationship between density, identity, and affect, prior to establishing whether these effects do in fact exist in crowds and small groups. The previous chapters used one-to-one interactions to hint at the fact that they exist in larger settings, but this is yet to be proven. Therefore, it would be premature to suggest that the current chapter offers conclusive support for a SCT approach to spatiality and crowding – it simply provides strong support for a SCT approach to visualised spatiality and crowding, which can be seen as a next chapter in the theoretical story that is unfolding. The following chapters will follow up this finding, first in the field (Chapter 7), and then in small groups in a controlled laboratory environment (Chapter 8).

Chapter 7: Introducing a two-way embodiment model of social identity processes (1). Identity, physicality and ‘collective joy’: A field study

7.1 Introduction

The personal space approach to crowding suggests that when a perceiver feels that their zone of ‘personal space’ is intruded upon, they will either (a) physically withdraw from the situation, or if withdrawal is not possible, they will (b) experience discomfort. The strength of this approach is that it takes into account the physical and social relations between the perceiver and the others co-present in the crowd, rather than simply focussing on individual personality variations (e.g., Freedman, 1975) or relying on complex interactions between several intervening variables (e.g. Rosenthal & Mayer, 1983) when explaining variable responses to crowding.

However, as discussed throughout this thesis, there are several major weaknesses with the traditional ‘personal space’ approach. For example, it can only account for when close proximity will be avoided or experienced negatively (i.e., as uncomfortable or stressful – such as on a packed commuter train), but does not provide an explanation as to why people sometimes seek out close proximity to others and then experience that close proximity positively (i.e., as warm, exciting and enjoyable – as might be the case on a packed football terrace, in a nightclub or concert, or with relevance to this chapter, at a demonstration). Another problem with the traditional approach is that it relies on a long list of intervening variables to explain why and when close proximity might be perceived as an intrusion, and in doing so, cannot explain intra-cultural, intra-individual, or within-location variability in responses to crowding.

I have argued that in light of these weaknesses, the concept of ‘personal space’ should be radically reconceptualised (see also: Novelli et al., 2010). Rather than seeing our desire for physical proximity as operating solely as a function of broad cultural norms, static interpersonal relationships, or as a function of fixed situational variables (such as whether an interaction takes place indoors or outside), it should instead be seen as a reflection of our psychological proximity to those people with whom we are interacting. When

interacting with those perceived as self (i.e., other in-group members), we might seek out and enjoy close physical proximity to them. However, when interacting with those perceived as other (i.e., other individuals when we are self-categorized according to our personal identity, or out-group members when self-categorized according to a social identity) we may seek a spatial distance that reflects our psychological distance, or if any physically close proximity is unavoidable, we might experience this incongruence between our psychological and physical distance as stressful or unpleasant.

The studies described in previous chapters have tested, and to some extent supported, the idea that participants' proximal desires can operate as a function of psychological proximity. While much of this support came from laboratory studies in which participants anticipated one-to-one interactions, the previous chapter provided evidence to suggest that affective response to *imagined* close proximity in a crowd is also largely dependent upon the extent to which we identify with those others present. The obvious (and critical) next step is to investigate the impact of social identity processes on the experience of crowding in a physically co-present crowd. As discussed earlier (Chapters 1 and 5), although the empirical work in this thesis uses paradigms that look at both inter-individual interactions and large crowds (real and imagined), it is predicted that the same processes will operate in both. If anything, it is suggested that the impact of group relations on spatial and experiential outcomes to emerge from the inter-individual paradigm will be magnified in the studies of large crowds. If a person perceives other crowd members as out-group members or simply as other individuals, they will experience violations of the self-other boundary by several people defined as 'other' and from all angles. However, in an in-group crowd, a person will be surrounded by not one – but several people defined as self – people with whom they share a sense of belonging and solidarity, thus intensifying the positive collective feeling.

Several studies, which investigated the psychological impact of crowding, were discussed in Chapter 2. It became evident that an asymmetry exists between the observational evidence, which suggests that crowding responses can be positive (e.g., Durkheim, 1995/1915; Ehrenreich, 2007; Malbon, 1999; Morris, 1981) and the empirical work, which has largely focussed on the negative outcomes. Much of this empirical work has been conducted in

contexts where there is no reason to predict that anything other than participants' personal identities will be salient – e.g., on commuter trains (Evans & Wener, 2006), at railway stations during rush-hour (Mackintosh et al., 1975), or in retail outlets, such as supermarkets (Aylott & Mitchell, 1998) and shoe shops (Mackintosh et al., 1975). Therefore, the primary focus of the study described in the current chapter is to provide empirical evidence to highlight the potential for a high-density crowd, and more specifically, a high-density crowd whose members are united by a sense of shared social identity, to be the vehicle for collective joy.

There is already some suggestive evidence in support of this view. For example, Cassidy et al. (2007) have shown that attendees at the Magh Mela – a densely populated Hindu festival – reported extremely high levels of general positivity, despite the lack of basic sanitary facilities and physical space that resulted from the crowded environment. This finding was attributed to the religious identity that united the pilgrims in the crowd. In addition, Neville and Reicher (2008) have provided qualitative data which suggests that Scottish football fans experienced an enhanced sense of enjoyment when watching a football match in close physical proximity to fellow fans of the Scotland national team.

While these studies provided a first step towards illustrating the link between social identity and positive psychological outcomes in physically co-present crowds, the study described in this chapter aims to go beyond this preliminary work by quantifying this proposed link between social identity and collective joy. More specifically, the study will investigate the extent to which crowd members who possess a stronger sense of shared social identity will seek closer proximity to those around them by physically immersing themselves in the crowd (positioning themselves in a more central physical location) and how being at the physical core of a crowd that is psychologically central to self, might in turn facilitate feelings of collective joy.

However, it is important to stress that this hypothesised link between psychological and physical processes in crowds should not be seen as a static one-way relationship. It would go against observation and theory to suggest that people are simply drawn together because they share an identity, and that the process ends there. Physicality in a crowd is not always a case of simply being

close to, or sharing a space with those others present. On many occasions it is also a case of acting with them, often in synchrony – moving, chanting, walking, swaying, dancing and clapping. Therefore, to overlook the potential role that such synchronised physical co-action might have on social identity would be to overlook a potentially fascinating insight into the embodied, two-way nature of group formation: while social identity processes might physically draw us together, being together in space, and keeping together in time, might feed back and further strengthen the bonds between us.

For example, McNeill (1995) discussed several examples of the important role that synchronised movement has played in binding groups throughout history (e.g., in community dances, religious rituals, and political ceremonies). McNeill (1995) offered an evolutionary explanation of this phenomenon, suggesting that synchronised movement can lead to a positive collective experience which helps us to bond in groups – a process he called ‘muscular bonding’. However, the problem with relying on a post-hoc evolutionary account of synchronicity, identity, and group bonding is that the *perceptual* processes linking these variables remain a mystery. Acting as one with the group might increase our chances of perpetuating our genes due to the fact that we no longer operate as individuals, vulnerable to physical attacks, starvation, or being exposed to the elements; but how does synchronicity alter the way that we categorize others and ourselves?

SCT provides an alternative theoretical framework that can be used to understand the relationship between synchronised movement and group formation. According to SCT, ‘factors which enhance the salience of ingroup-outgroup categorisations tend to increase the perceived identity (similarity, equivalence, interchangeability) between self and ingroup members and so *depersonalize individual self-perception*’ (Turner, 1987, p. 50, emphasis in original). Turner (1987) went on to argue that ‘the depersonalization of self-perception is the basic process underlying group phenomena’. It can therefore be argued that synchronised action – such as a group of people moving, singing or chanting as a coherent unit – could operate as a possible criterion for depersonalization and the shared sense of social identification that goes with it. This potential for physical co-ordination to increase social identification can be used to gain a better understanding of the joyful responses that we so often

observe at crowded events: we enjoy close physical proximity to others in a crowd when they are perceived as an extension of self.

7.2 Study 7

The current research, then, has several objectives. First, in order to build on the laboratory work described in the previous chapters, the link between social identity and physicality in the crowd will be examined out in the field. Physicality can be broken down into two constituent parts, with the first relating to proximity, which will be defined in terms of perceived centrality in the crowd, and the second relating to synchrony. By examining these two aspects of physicality, it is hoped that the reciprocal relationship between social identity and collective participation will become clearer. As noted by the Prayag Magh Mela Research Group (2007), there is a large body of research examining the antecedents of collective participation, of which a sense of shared social identification is one. However, the Prayag Magh Mela Research Group also noted that there is hardly any research investigating how collective participation can change the ways in which we see the people around us and ourselves. The current study seeks to address this gap by demonstrating that being together in space, and then keeping together in time (or in other words, the constituent parts of physicality) can facilitate the depersonalization process and hence strengthen the bond between crowd members. It is predicted that an outcome of this interplay between the psychological and physical in crowds is the collective joy that is so often overlooked by psychology. However, it is important to stress whilst the design of the study allows for a quantitative assessment of being together in space, hypotheses relating to the synchronous element of physicality are based on the assumption that a period of marching, chanting and playing musical instruments will involve ‘keeping together in time’ – thus providing an opportunity to take a preliminary look at this dimension of physicality.

7.2.1 Study overview

The study described in this chapter was a cross-sectional field study conducted at a national march and rally, which took place in central London on November 3rd 2007. The event was organised by UNISON (Britain’s largest public sector

union) and was intended to be a platform from which supporters of the National Health Service (NHS) could express support for, and solidarity with the NHS, which has been largely owned and run by the public sector since its launch on July 5th 1948 (UNISON, 2007). It was hoped that the British government would take note of the anti-privatisation stance of those involved. It was estimated by UNISON (2007) that approximately 7,000 people took part.

This study provides an opportunity to build on observational, laboratory, and anecdotal evidence by quantitatively testing the suggestion that participating in a crowd event can be associated with 'collective joy'. Two mediation models will be tested, which are both in line with a SCT approach to crowding. The first relates to the extent to which the relationship between psychological proximity and 'collective joy' is mediated by physical proximity. It is predicted that the *psychological* process of depersonalization (self-categorizing according to a social identity) will lead to a positive crowd experience; the more 'at one' that the demonstrators feel with their fellow crowd members, the more positive their experience of being amongst them will be. However, it is argued that the depersonalization process will also motivate the demonstrators to seek a *physical* location in the crowd that they perceive as more central, and that this perceived centrality will account for their positive collective experience. Measures of subjective centrality/proximity will be preferred to an objective measure for the following reasons: (a) the hypothesis is focussed on the relationship between *participants' perceptions* of psychological and physical proximity, and (b) any measure of 'objective' physicality would be based on estimations made by four researchers, whose perceptions of participants' location might vary to some extent, and thus be unreliable as a measure.

The second mediation model will switch the predictor and mediator variables from the first model. In other words, the indirect effect of physical location in the crowd on positive experience will be tested, with the psychological process of social identification as the proposed mediator. It is predicted that when the demonstrators perceive their location in the crowd as more central, they will have a more positive crowd experience. However, it is also suggested that physical centrality will be associated with an increased sense of psychological 'oneness', or in other words, demonstrators who are at

the physical core of the crowd will identify with their fellow crowd members to a greater extent, which in turn will lead to a more positive crowd experience.

These two mediation models will form the core analyses for the current chapter. However, as the demonstration was structured in three phases (see below), with a mile-long march between the two data collection points, it will also be possible to tentatively examine the role of synchronised movement – the second proposed aspect of physicality – on the demonstrators' social identification and their levels of collective joy. This is based on the assumption that as the demonstrators march from one part of the demonstration to the next, they will to some extent, keep in time with one another (this is made more likely by the fact that the demonstrators chanted and played musical instruments while they marched). It is predicted that this synchronised movement between phases one and three will lead to increases in both social identification and self-reported positive experience. However, it is also predicted that any increase in positive experience will be mediated by an increase in social identification. In other words, as the demonstrators engage in synchronised movement – as they act as a more coherent unit – they will identify more with each other as NHS supporters. This increased sense of social identification will then lead to a more positive experience of being in the crowd, as other crowd members come to be increasingly defined as self.

7.3 Method

7.3.1 Phases of data collection

The demonstration was designed to take place in three phases. Phase one was the assembly at Temple Place, Victoria Embankment, London, from 11am until 12.30pm. Phase two consisted of a mile-long march along Victoria Embankment and then through Westminster. The final phase was a rally, which took place at Trafalgar Square from 1.30pm onwards. Data collection was focussed on phases one and three.

7.3.2 Participants

Four researchers approached demonstrators and asked them to take part in a questionnaire survey on participant perceptions of large-scale demonstrations.

In total, 112 demonstrators agreed to take part and made up an opportunity sample (58 female, 54 male). Ten people declined to complete the questionnaire, but did not provide a reason for doing so. The ages of the final sample ranged from 14 to 67 ($M = 39.22$, $SD = 13.42$). Data was collected from 56 demonstrators during each phase (*phase one*: 28 male, 28 female; age range = 14 to 67, $M = 37.00$, $SD = 15.00$; *phase three*: 26 male, 30 female; age range = 19 to 63, $M = 41.00$, $SD = 11.00$). It is difficult to conclude with certainty that the sample was demographically representative of the crowd as a whole, due to the large number of people present. However, based on reviews of photographs taken on the day, the sample does appear to broadly represent the gender balance and age range of those present.

7.3.3 Measures

Unless stated otherwise, the items used a response scale, which ranged from 1 (not at all) to 7 (very much).

Variable 1: Social identification⁷: Participants' social-identification as NHS supporters was measured using adapted items from Ellemers et al. (1999). These were: '*I identify with other people who are at this NHS demonstration*', '*I am like other people who are at this NHS demonstration*', and '*Being a demonstrator on this march is a reflection of who I am*', as well as an additional item – '*Being a part of this crowd is important to me*' – which was designed for the purpose of this study. The items scaled together reliably ($\alpha = .78$) and were therefore combined to provide a composite measure of identification.

Variable 2: Positive experience: Four items were designed to measure participants' positive experience. The first three were: '*I am glad to be part of this crowd*', '*I feel happy*', and '*I am proud to be part of this crowd*'. The fourth measure was '*I am not enjoying this event*', and used a response scale ranging from 1 (completely agree) to 7 (completely disagree) ($\alpha = .66$). The mean of

⁷ Previous chapters have used Leach et al.'s (2008) multi-component measure of identity as this is thought to be the most comprehensive measure. However, the current study was conducted prior to the publication of Leach et al.'s (2008) paper.

these items was calculated to obtain a composite measure of positive experience.

Variable 3: Perceived location in the crowd: The following three items were used to measure participants' perceived location in the crowd: 'I am right in the middle of the crowd', 'I am away from the middle of the crowd' (later reverse-coded), and 'I am in the thick of things' ($\alpha = .73$). Again, these three items were combined to obtain a single-score representation of perceived location.

7.3.4 Procedure

Four researchers arrived at the demonstration assembly point at approximately 11.30 a.m. and immersed themselves in the gathering crowd of demonstrators. For phase one of the data collection, demonstrators who were waiting for the march to begin were approached and asked to fill in a questionnaire. When approaching small groups of demonstrators within the crowd, only one member of the group was asked to complete the questionnaire in order to avoid non-independence of responses. They were asked to complete the items alone. Having completed the questionnaire, participants were provided with a full written debrief.

The march through Westminster began after one hour of data collection. The researchers marched with the demonstrators until they reached Trafalgar Square. At this point, the researchers again immersed themselves among the protestors to begin collecting data during the third phase of the demonstration. The data collection procedure for phase three also lasted for one hour and was exactly the same as that carried out during the first phase.

7.4 Results

Bootstrapping procedures with bias corrected and accelerated confidence intervals were used to test the mediation models discussed below, as the use of the Sobel (1982) test and the Baron and Kenny (1986) method to determine the significance of mediator variables is thought to be unreliable when using smaller samples (Preacher & Hayes, 2004; see Chapter 6, section 6.3.3.3 for more detail). The analyses were based on 5,000 bootstrap samples and conducted using the SPSS macro devised by Preacher and Hayes (2004).

A note on perceived location: Prior to reporting the mediation models, it is important to note that the researchers each estimated the demonstrators' location in the crowd (on a scale which ranged from 1 (periphery) to 7 (centre)). A significant positive correlation was found between the researcher and demonstrator perceptions of location, $\beta = 0.22$, $t = 2.22$, $p = .03$, $r = .21$. Although it could certainly be argued that the researchers' estimates may not have been entirely objective, or accurate, this finding at least points to an objective confirmation of the demonstrators' location in the crowd.

7.4.1 Model 1: Perceived location in the crowd as a mediator of the relationship between social identification and positive experience

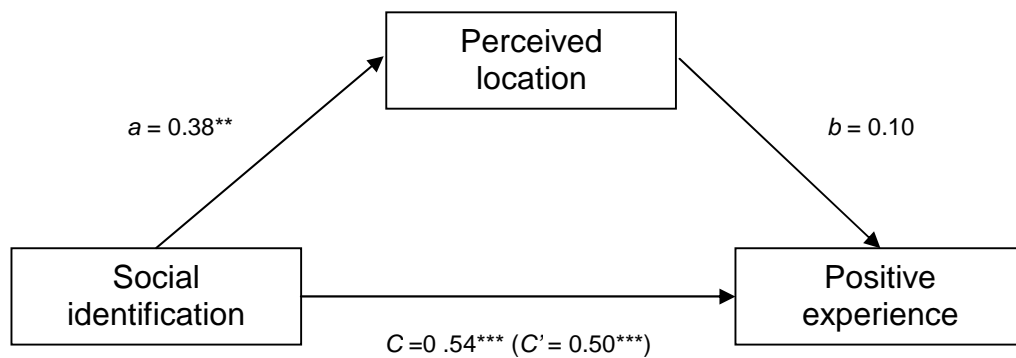


Figure 7.1 Perceived location in the crowd as a partial mediator of the relationship between social identification and self-reported positive experience. Values represent β weights * $< .05$ ** $< .01$, *** $< .001$.

As shown in Figure 7.1 (above), the total effect of social identification on positive experience associated with being in the crowd is highly significant, $c = 0.54$, $t = 8.29$, $p < .001$. The direct effect of social identification is also highly significant, $c' = 0.50$, $t = 7.42$, $p < .001$, which indicates that any mediation effects will be partial. With a point estimate of .04 and a 95% BCa bootstrap CI of 0.003 to 0.092 (as these values do not contain zero, the effect is significant), perceived location in the crowd is indeed a significant partial mediator of the effect of social identification on positive experience of being in the crowd.

Closer examination of the a and b paths reveals that, as expected, social identification was associated with a more positive experience and this effect was partially mediated by the demonstrators perceiving their physical location to be more central.

7.4.2 Model 2: Social identification as a mediator of the relationship between perceived location in the crowd and self-reported positive experience

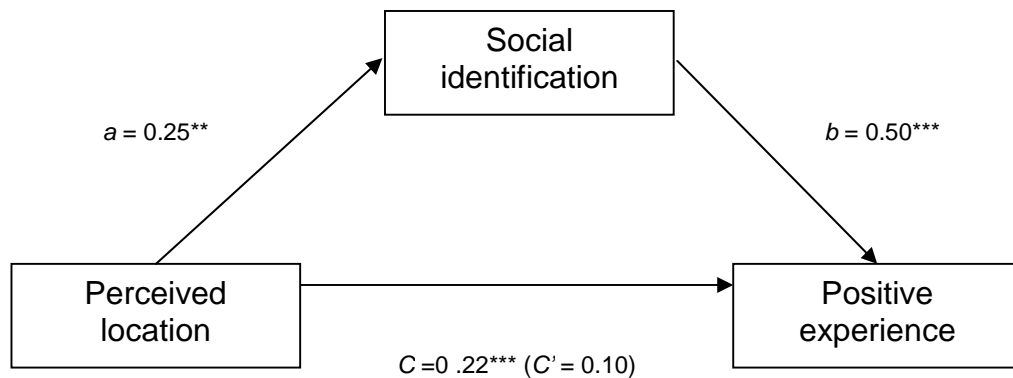


Figure 7.2 Social identification as a mediator of the relationship between perceived location in the crowd and positive experience. Values represent β weights * < .05, ** < .01, *** < .001.

Figure 7.2 (above) shows that the total effect of perceived location in the crowd on positive experience is highly significant, $c = 0.22$, $t = 3.51$, $p < .001$. The direct effect of perceived location is not significant, $c' = 0.10$, $t = 1.80$, $p = .08$ (ns), which suggests that with a point estimate of .12 and a 95% BCa bootstrap CI of 0.052 to 0.215, social identification fully mediated the effect of perceived location in the crowd on positive experience. The direction of the relationships shown in Figure 7.2 shows that the demonstrators who perceived their location in the crowd to be more central expressed higher levels of social identification as NHS supporters, and this in turn led to a more positive crowd experience.

7.4.3 Model 3: The effect of ‘synchronised movement’ on social identification and self reported positive experience.

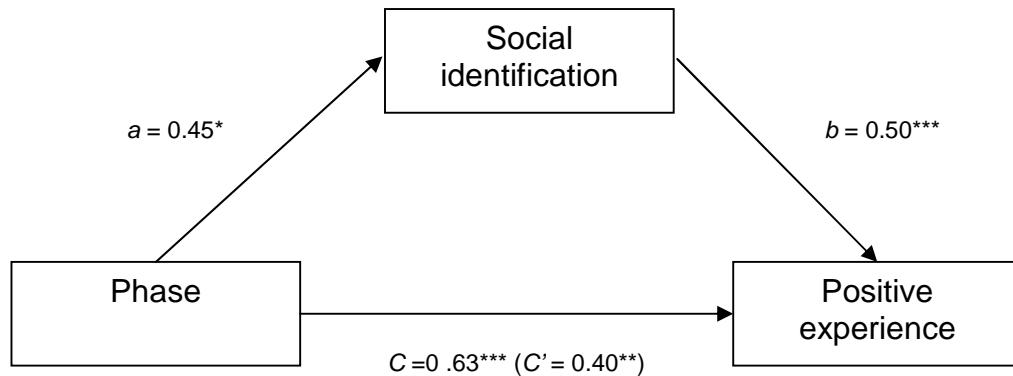


Figure 7.3 Social identification as a mediator of the relationship between phase of demonstration and self-reported positive experience. Values represent β weights * < .05, ** < .01, *** < .001.

In order to tentatively examine the effect of ‘synchronised movement’ – the second proposed aspect of physicality – on the demonstrators’ reported levels of social identification and positive experience, the mean scores for each of these variables during phase one were compared with the mean scores during phase three (using independent t -tests). Social identification differed significantly between phases one and three, $t(110) = -2.26$, $p = .01$, $r = .21$. Investigation of the means reveals that social identification was higher for the demonstrators during phase three ($M = 6.14$, $SD = 0.89$) than it was for the demonstrators during phase one ($M = 5.69$, $SD = 1.20$), as predicted. Self-reported levels of positive experience differed significantly between the phases to a highly significant degree, $t(110) = -3.76$, $p < .001$, $r = .33$. Again, there was an increase from phase one ($M = 5.76$, $SD = 1.03$) to phase three ($M = 6.39$, $SD = 0.71$), as hypothesised.

Figure 7.3 shows an elaboration of the relationship between these three variables. As can be seen, there is a highly significant total effect of phase on

positive experience, $c = 0.63$, $t = 3.76$, $p < .001$. The direct effect is somewhat reduced, but still significant, $c' = 0.40$, $t = 2.92$, $p = < .01$. This indicates that any mediation effects will be partial. With a point estimate of .22 and a 95% BCa bootstrap CI of 0.038 to 0.476, social identification partially mediated the relationship between phase and positive experience. The direction of the a and b paths shows that moving from phase one to phase three was associated with an increase in social identification, which in turn was associated with a more positive crowd experience.

7.5 Discussion

As hypothesised, high levels of 'collective joy' were reported at the NHS demonstration under investigation. Mediation models 1 and 2 support a SCT approach to this positive crowd experience. Model 1 shows that participants who identified more as NHS supporters had a more positive experience and that this relationship was partially mediated by their location in the crowd. That is, higher identifiers positioned themselves in a location which they perceived as more central, and this in turn was associated with a more positive experience. This finding is in line with the evidence presented in previous chapters, which suggests that social identification has an influence over our desire for, and experience of, close physical proximity to in-group members (see also Novelli et al., 2010).

However, model 2 revealed that the relationship between physical proximity and positive experience was fully mediated by the demonstrators' level of social identification. In other words, a more central location, and hence closer physical proximity to crowd members, was associated with higher levels of social identification with those crowd members, which in turn was associated with a more positive experience.

Of course, due to the correlational design of the study, it would be impossible, and indeed misleading to interpret either of the models as *causal*. It is not the case that the first model highlights that social identification caused participants to seek closer proximity, which then caused them to have a more positive experience. Nor is the case that model 2 describes perceived physical location as a cause of social identification and social identification as a cause of 'collective joy'. These models simply highlight the tendency for these

dimensions to co-vary and provide an opportunity to examine the relationships between them.

So, what do these models suggest of the relationship between proximity, identity and collective joy? The first thing to note is that it makes perfect sense for model 1 to suggest only partial mediation. There is no reason whatsoever to suggest that the relationship between social identity and positive experience is completely accounted for by close physical proximity. Other aspects of shared identity, such as sharing an ideology, working together to achieve goals, and feelings of empowerment that might come from collective participation, might also account for the increases in positivity that the demonstrators reported. Therefore, it is hardly surprising that the relationship between identity and positive experience remained significant, although less so, when physical centrality was included in the model. In other words, physicality accounted for this relationship to some extent, but not fully, possibly due to these other potential unmeasured variables.

The fact that the second model suggested full mediation also makes theoretical sense. It has been argued throughout this thesis that variable responses to crowding operate as a function of our variable desires for close physical proximity, which in turn operate as a function of the variable and multiple nature of our self-concept. In other words, whether our definition of self is inclusive or exclusive of others co-present will impact on our desire for, and experience of close physical proximity to them. This line of reasoning is supported by model 2: being at the core of the crowd was associated with an increase in positive experience, but this relationship was fully accounted for by the extent to which those at the core identified with their fellow crowd members.

These findings provide interesting insights into the relationship between physical and psychological processes in crowds. However, the third set of findings, which compared social identification and positive experience at phases one and three, provided at least suggestive evidence in support of the idea that physicality – this time in the form of *synchronised movement* – can impact on identity processes and the experience of crowding. It was shown that both social identification and collective joy increased between phases one and three of the demonstration (after a period of largely synchronised movement). In addition, the relationship between phase and collective joy was partially

mediated by the demonstrators' social identification, which hints at the potential for physical co-presence and co-action to weaken the boundary between individual and group, while intensifying our positive collective responses. This finding is of particular importance as it demonstrates for the first time, the potential impact that physical orientation can have on social identification.

While a promising start, a limitation to this study must be acknowledged. The conclusion that synchronised movement played a part in the increased social identification and collective joy fits in part with the proposed SCT hypothesis relating to a coordinational basis of self-categorization. However, it is a conclusion based solely on correlational evidence. The demonstrators certainly marched as a single unit, chanted and played musical instruments in the period between the two data collection points, so in that sense they were seen to be 'moving in time'. However, due to lack of control over the critical variables, it is impossible to rule out the possibility that the increases in social identity and collective joy were simply the result of a time effect (or indeed some other extraneous variable). It could be argued that simply being with in-group members – people who share our norms and values – might strengthen group bonds, and in turn make the experience of crowding more positive.

Therefore, in order to supplement the suggestive evidence presented in the current chapter, the following chapter will examine the potential two-way relationship between synchronicity and social identity, and their impact upon experience of close physical proximity. This time, the work will be conducted in a laboratory environment where it is possible to retain control over the critical variables and minimise the impact of potential confounds.

Chapter 8: Introducing a two-way embodiment model of social identity processes (2). Identity, synchrony and ‘collective joy’: A laboratory study

8.1 Introduction

The core finding of the previous chapter is of fundamental importance in the context of this thesis. The link between social identity and physical proximity – a link already established in one-to-one interactions and imagined crowd scenarios in the experimental studies described in the preceding chapters (and also Novelli et al., 2010) – was quantified out in the field for the first time at a large-scale demonstration. It was shown that demonstrators who identified more with the other crowd members (as supporters of the NHS) sought a physically more central location in the crowd. That is, they immersed themselves in the crowd and placed themselves in a position where they would experience closer proximity to their fellow crowd members. In addition, it was shown that contrary to much of the early crowding research (discussed in Chapter 2), being at the centre of a densely populated crowd in inevitably close proximity to strangers, was associated with enhanced positive feelings. In line with a SCT account of crowding, this relationship between physicality and positivity became non-significant when the demonstrators’ social identity levels were held constant – that is, the demonstrators’ positive feelings were enhanced because they were in close physical proximity to people who were perceived as in-group members.

These findings further highlighted the impact that the process of depersonalization can have on our physical relations in crowds. They demonstrated that as the psychological boundary between self and other relaxes, so too can the physical boundary. However, it was also argued in the previous chapter that to be in an in-group crowd – a crowd that is united psychologically – is not to simply share a space. It is not a static process, which ends when we are brought together, content with simply rubbing shoulders with one another. More often, crowds gather for a purpose – e.g., to support a team, to enjoy music, to voice an opinion, or to attempt to bring about social change – and achieving these purposes often involves some form of synchronised co-

action such as chanting, marching or clapping. This raises questions regarding whether or not these forms of synchronised physical co-action might impact upon the ways in which we see those we are acting in unison with, and ourselves.

It was speculated in the previous chapter that synchronised movement might operate as a criterion for comparative fit and hence the salience of a social category and the enhanced in-group identification that goes with such co-action. Tentative support for this argument came from the finding that the demonstrators' sense of shared social identification increased between the two phases of data collection. Although the time between these two phases of data collection was largely characterised by periods of sustained synchronised action (especially in the form of marching, but also in the form of chanting and playing musical instruments), it is impossible to conclude with confidence that the synchronised action *caused* the social identity increases. This is due to the lack of control over the critical variables that comes with correlational studies, such as the one described in the previous chapter.

Therefore, the study presented in this chapter was designed to supplement the important, ecologically valid fieldwork that was described in Chapter 7, by examining the causal effects of synchronised movement on social identity processes in a controlled laboratory environment.

Following McNeill's (1995) observation that following periods of sustained synchronised movement, collectives can experience 'joy', Wiltermuth and Heath (2009) conducted an experiment to investigate whether synchronicity could have a positive effect on group-level processes, such as in-group cooperation. To test this idea, participants were assigned to one of four conditions (1. no singing or movement, 2. synchronised singing, 3. synchronised singing and movement, and 4. asynchronous singing and movement), in groups of three. It was found that cooperation was highest in the groups who had synchronised their action and that the relationship between synchronicity and cooperation was partially mediated by the participants' feelings of 'being on the same team'.

However, the authors did not link this finding to a theoretical framework such as SCT. In fact, while they acknowledged that the effects could be facilitated by 'social attachment', they dismissed the potential role of *social identification*. This conclusion was based on the fact that all of the groups were

referred to as ‘groups’ in an attempt to induce feelings of social identity – a method that is common in social identity research. Thus, it was claimed that social identity would be highly salient for participants in all conditions. However, the authors relied on the *assumption* that this approach would lead to equal levels of social identification across the conditions. While this may be the case, the authors did not report whether there were actually differences in social identification across the conditions – they stated that participants were asked to complete a measure of ‘similarity’ following the a/synchronous activity, but did not report the findings from this measure. In fact, if anything, their reported findings do point to the suggestion that identity did vary across conditions. To elaborate, it was found that participants in the synchronised conditions reported higher levels of ‘being on the same team’ than did those in the asynchronous condition, and more importantly, the effect of synchronised movement on in-group cooperation was mediated by the participants’ feelings of ‘being on the same team’. Thus, it is unclear how feelings of ‘being on the same team’ and social identification are distinguished in this case, and as a result, it seems reasonable to question the authors’ decision to outwardly reject the link between synchronicity, identity, and group co-operation.

The relevance of Wiltermuth and Heath’s (2009) findings to the current research does not end there. In disagreement with McNeill (1995), the authors concluded that synchronised action does not need to instil ‘collective joy’ to increase participants’ desire to cooperate with the group. Wiltermuth and Heath’s (2009) conclusion makes sense from a SCT perspective. Rather than seeing collective joy as a mediating variable between synchronised movement and group bonding, group bonding – or in other words, social identification – should be seen as a mediating variable between synchronised movement and collective joy. To elaborate, synchronised movement might increase the salience of a social identity and lead to the depersonalization of individual perceivers in a crowd. This increased identity salience should then facilitate the joyful responses that we so often observe at crowded events as our physically proximal relations are to people who we perceive to be increasingly proximal to our psychological self. In other words, we should feel more comfortable, relaxed, happy and so on, as we come to realise that those around us are like

us – that they *are* ‘us’ – and hence share our perspectives, ideologies, goals or desires, and with whom we share a sense of solidarity or fate.

8.2 Study 8

Robust evidence from multiple methods has demonstrated that social identity affects physical behaviours such as proximity (e.g., Neville & Reicher, 2007; Novelli et al., 2010, and the studies already presented in this thesis) and the choice of location in a crowd (see Chapter 7). The obvious next step is to consolidate evidence in support of the second part of the two-way relationship between the psychological and the physical – a relationship that is so intuitively plausible (e.g., from swaying fans at sports events and festivals, or from anthropological observation) yet hardly tested and barely theorised in experimental social psychology.

In other words, this study allows for a further test of the impact of physical co-action (in the form of synchronised movement) on participants’ psychological responses. The design of the experiment involves participants sitting in small groups at close proximity to one another⁸. Having been told that they were taking part in an experiment investigating whether or not social facilitation effects (e.g., Triplett, 1897-1898; Zajonc, 1965, 1980) were the same in student and non-student samples, participants were asked to complete a ‘learning task’ which involved either synchronised or non-synchronised movement. Thus, the experimental design allowed for control over the independent variable. This allows for a clearer test of the impact of synchronised movement on social identification, and hence the experience of close physical proximity.

Thus, the first hypothesis, which is central to this study, is that the groups who synchronise their movement will identify more with their laboratory group than those who do not move in synchrony. This is based on the assumption that moving as a unit will operate as a criterion for salience and hence shared social identity.

⁸ Although small groups differ in size from many types of crowd (such as those at sports events, festivals, and raves), there is a long tradition of investigating crowd processes in small groups, based on the premise that social identity and self-categorization principles should apply to both small and large groups such as laboratory groups and crowds respectively. A good example of this can be found in the deindividuation literature (see Reicher, Spears, & Postmes, 1995).

A secondary aim of the current study is to assess the extent to which social identity processes mediate the relationship between synchronised movement and the participants' positive group experience. It is predicted that synchronised movement will lead to increased social identification, and that despite the densely arranged chair configurations, the dimensions of social identification which relate to the relationship between self and other group members (such as solidarity, centrality, and individual self-stereotyping; Leach et al., 2008), will mediate the relationship between synchronised movement and positive group experience. In other words, the groups will enjoy their 'crowded' experience more as their sense of social identification intensifies and group members become increasingly defined as self.

8.3 Method

8.3.1 Design

A between-subjects design was used for the current study. The independent variable was manipulated across two levels (1. synchronised movement, and 2. individual movement).

8.3.2 Participants

Sixty-two participants whose ages ranged from 18 to 33 ($M = 19.74$, $SD = 2.17$) took part in the study in exchange for either partial fulfilment of course requirements, or a cash payment of £6. As was the case in the other experimental studies presented in this thesis, the sample was comprised of female native English speakers. This was to minimise the potentially confounding effects of gender (Uzzell & Horne, 2006) and culture (Evans & Howard, 1973; Evans et al., 2000; Hall, 1966) on spatial behaviours, and hence the experience of crowding.

8.3.3 Materials

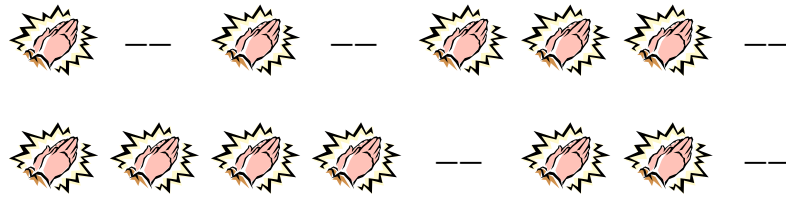


Figure 8.1 Example of a clapping pattern given to participants as part of the stimulus for the 'learning task'.

Clapping patterns: A series of eight clapping patterns were devised for the current study. The patterns were loosely based on clapping patterns used by spectators at sporting events around the world. The patterns were presented to the participants in graphical form – an example is displayed in Figure 8.1. Participants were asked to repeat each of the patterns several times (ranging from five times to ten times) to ensure that they were moving for a sustained period of time when performing the patterns to the experimenter.

8.3.4 Measures

'Dummy' questions: Four items were added to the measures of the dependent variables, which were contained in a questionnaire and handed to the participants at the end of the procedure (see below). The four items were designed to enhance consistency between the false research objective (social facilitation effects) and the measures completed by the participants. Thus, the opening items to the questionnaire were as follows: '*I feel that the presence of the other participants enhanced my ability to learn*', '*I feel that the presence of the other participants impaired my ability to learn*', '*I found the learning task to be easy*', and '*The learning task was challenging*'. These items were not used for analytical purposes.

Dependent variables: Social identification and positive group experience:

Identification with the laboratory group was measured using an adapted series of items compiled by Leach et al. (2008). The identity components and their

corresponding measures were as follows: (i) solidarity (*'I feel a bond with the group of people who just participated in the study with me'*, adapted from Cameron, 2004; Doosje et al., 1998, *'I feel solidarity with the group of people who just participated in the study with me'*, adapted from Leach et al., 2008, and *'I feel committed to the group of people who just participated in the study with me'*, adapted from Doosje et al., 1995), (ii) centrality (*'I will often think about the fact that I was in the group that just participated in this study'*, adapted from Cameron, 2004, *'The fact that I am in the group that just participated in this study is an important part of my identity'*, adapted from Luhtanen & Crocker, 1992, and *'Being in the group that just participated in this study is an important part of how I see myself'*, adapted from Doosje et al., 1998; Ellemers et al., 1999; Luhtanen & Crocker, 1992), (iii) individual self-stereotyping (*'I have a lot in common with the other people who participated in the study with me'*, adapted from Spears et al., 1997, and *'I am similar to the other people who participated in the study with me'* (adapted from Doosje et al., 1995; Spears et al., 1997), and finally (iv) perceived in-group homogeneity (*'The people who just participated in the study with me have a lot in common with each other'*, adapted from Spears et al., 1997, and *'The people who just participated in the study with me are very similar to each other'*, adapted from Ellemers et al., 1999; Spears et al., 1997).

When measuring 'satisfaction' with regards to the laboratory group identity, the items were as follows: *'I was glad to be in the group that just worked together during this study'* (adapted from Cameron, 2004; Doosje et al., 1998; Luhtanen & Crocker, 1992), *'I think that the group that just participated in the study together has a lot to be proud of'* (adapted from Ellemers et al., 1999), *'It was pleasant to be in the group that just participated in the study'* (adapted from Doosje et al., 1998), and *'Being in the group that participated in the study gave me a good feeling'* (adapted from Cameron, 2004; Luhtanen & Cocker, 1992). It is important to note that due to the change from the use of present tense (in the original measure, Leach et al, 2008) to past tense, the items originally designed to measure 'identity satisfaction' perhaps measured something which would be better described as 'positive group experience'. Accordingly, from this point on, when discussing identity 'satisfaction', it will be referred to as 'positive group experience'.

8.3.5 Procedure

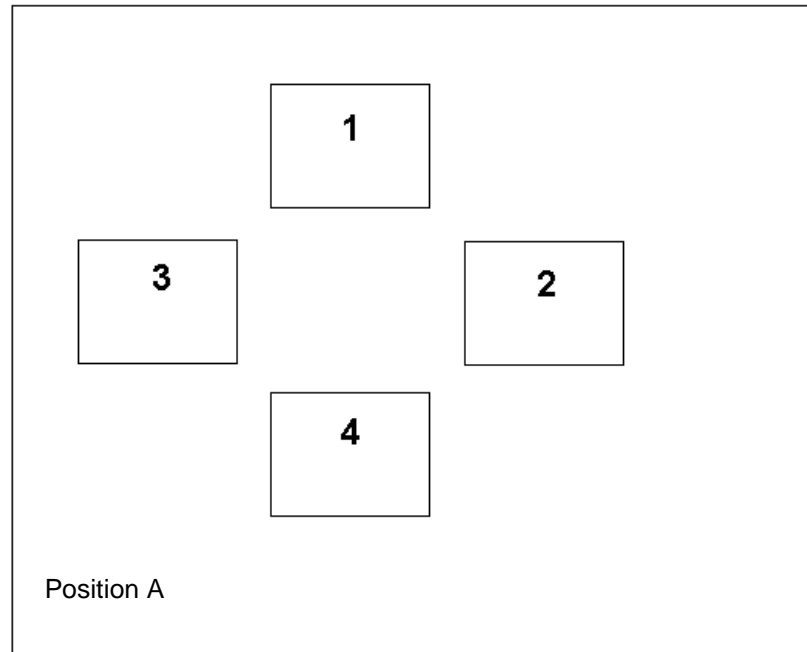


Figure 8.2 Room layout, Chapter 8

Participants took part in groups of either three or four (there were an even number of three and four-person groups in each condition: five groups with three participants and four groups with four participants). The laboratory had been set-up prior to the participants' arrival. The layout of the room is depicted in Figure 8.2.

Four chairs were arranged facing each other in a square formation. The mean distance between the chairs was approximately 26 inches. The mean distance was calculated by taking measures of the four leg-to-leg distances plus the distance between the middle of the front edge of the base of the seats and then dividing by five. In Novelli et al.'s (2010) 'personal space' studies, the smallest mean distances were 38.60 ($SD = 4.95$) inches in study 1, and 46.56 ($SD = 1.19$) inches in study 2 (study 1 in Chapter 4 of this thesis). Both of these distances were for participants expecting interaction with an in-group member. It can therefore be deduced that as the 26-inch distance used in the current study is more than two standard deviations closer together than the smallest mean distance observed by Novelli et al. (2010), the chair configuration will be too close for almost everyone, regardless of the group context, thus causing

some level of discomfort to the participants. There were four chairs left in the laboratory regardless of the number of participants in each group.

When entering the laboratory, participants were informed that the seats had been arranged in a specific way. They were asked to take a seat and to take care not to move any of the chairs when sitting down. Having settled, participants were handed a written brief, which provided a cover story relating to the purpose of the study. Participants were briefly informed of social facilitation effects and told that the current study was being conducted to establish whether social facilitation effects on learning were equal in student and non-student samples.

The experimenter then handed each participant a sheet of paper detailing the instructions to the 'learning task' that they would be asked to complete. For participants in both of the experimental conditions, the instructions stated that they would be allowed ten minutes to work as group to interpret the clapping patterns. They were told that they would then be asked to perform the patterns to the experimenter so that the extent of their learning could be assessed. Participants in the individual movement condition were told that only one person should be clapping at any one time, and that they would be asked to perform the patterns individually. They were told that they must clap at least two patterns each. Participants in the synchronised movement condition were told that they should perform the patterns as a group, synchronising their claps.

The experimenter then left the room for ten minutes while the participants worked collectively to interpret the clapping patterns before re-entering and asking the participants to perform. The experimenter sat in position 'A' while the participants performed. When the performance was complete, the experimenter handed out questionnaires containing the measures of the dependant variables to each of the participants and asked them to complete them alone. Having completed the questionnaires, participants were probed for suspicion with regards to the true nature of the study before being fully debriefed.

8.4 Results

A note on analytic strategy: As the design of the current study involved interaction between participants (in both of the conditions), there was some concern regarding the potential for the assumption of independence to be violated (see Kenny, 1996; Kenny & Judd, 1986; Kenny, Kashy, and Bolger, 1998). In order to overcome this potential problem, the mean score for each group was used as the unit of analysis; a method often used in small group research (e.g., Gaertner & Schopler, 1998). Although this method incurs a loss of power due to the reduced N (from thirty one participants in each condition to nine groups in each condition), it was considered to be the appropriate statistical approach.

8.4.1 Reliability analyses

Reliability analyses were conducted to ensure internal consistency between the items within each of the four laboratory group identity components and also the measures of 'positive group experience'. It was found that the items largely scaled together reliably within each of the identity components (solidarity: $\alpha = .63$, centrality: $\alpha = .76$, individual self-stereotyping: $\alpha = .93$, perceived in-group homogeneity: $\alpha = .93$) as did the measures of positive group experience ($\alpha = .89$). Therefore, mean scores were calculated to obtain four single-score representations of identification and one single-score representation of positive group experience.

8.4.2 Main effects

When comparing the conditions on each of the identity components, *t*-tests revealed a significant difference in 'solidarity', $t(16) = -2.23$, $p = .04$, $r = .47$, with the groups in the synchronised movement condition ($M = 4.56$, $SD = 0.48$) expressing higher levels of perceived solidarity than the groups in the individual movement condition ($M = 3.94$, $SD = 0.68$). A highly significant difference in identity centrality also emerged between the conditions, $t(16) = -3.83$, $p = .001$, $r = .69$, with a large effect-size. Unsurprisingly perhaps, groups in both of the conditions reported low levels of laboratory-group identity centrality. However, and importantly, the identity was more central to the groups in the synchronised movement condition ($M = 2.27$, $SD = 0.30$) than it was to the groups in the

individual movement condition ($M = 1.77$, $SD = 0.25$). T -tests also revealed a highly significant difference between the conditions in positive group experience, $t(10.97) = -3.13$, $p = .01$, $r = .62$, with a large effect-size. The groups who synchronised their movement ($M = 5.46$, $SD = 0.28$) reported a more positive group experience than did those who moved individually ($M = 4.73$, $SD = 0.64$).

There was not a significant difference between the conditions in individual self-stereotyping, $t(16) = -1.43$, $p = .18$, $r = .34$, although as predicted, the groups in the synchronised movement condition ($M = 3.78$, $SD = 0.63$) scored higher than the groups in the individual movement condition ($M = 3.40$, $SD = 0.47$).

In summary, then, synchronised movement led to significant increases in social identification on the dimensions of solidarity and centrality, as well as positive group experience. However, there were not significant differences between the conditions in individual self-stereotyping.

8.4.3 Multiple mediation model

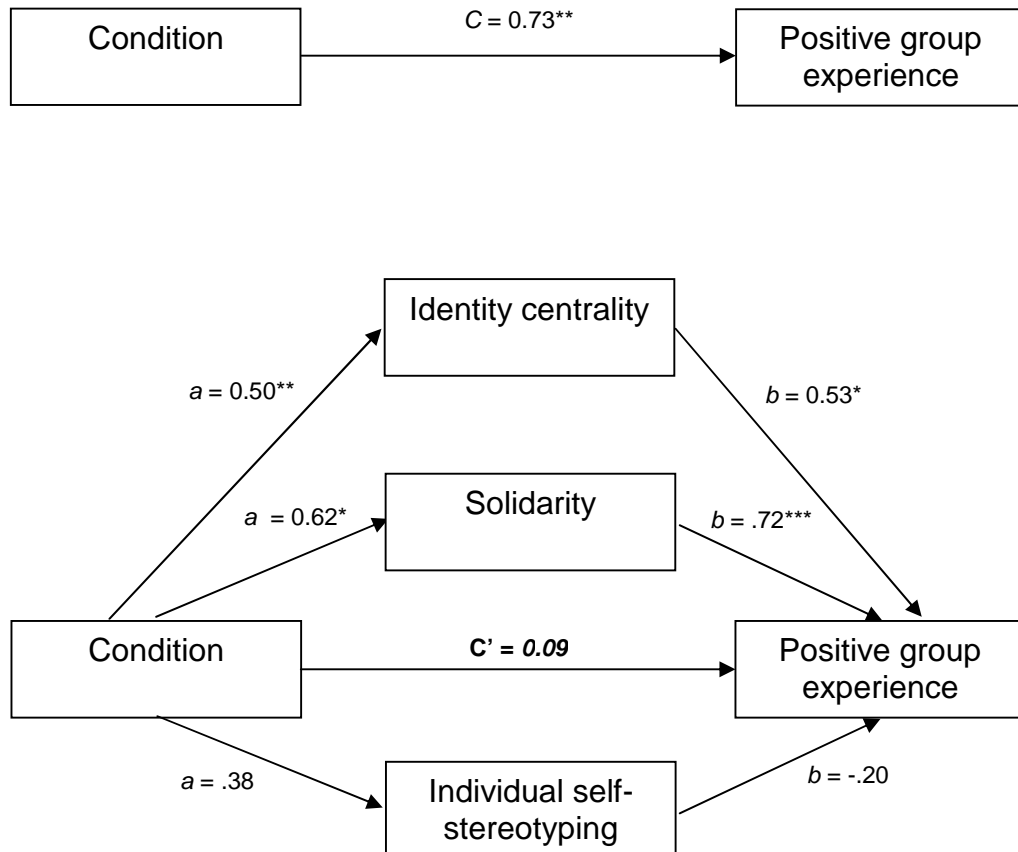


Figure 8.3 Multiple mediation model for direct and indirect effects of condition (synchronised vs individual movement) on self-reported positive experience. Values represent β weights * $< .05$, ** $< .01$, *** $< .001$.

In addition to the key test of the relation between synchronised movement and identity, it was hypothesised that the effect of synchronised movement on the groups' self-reported positive group experience would be mediated by the three identity components which described the relationship between self and the other group members (identity centrality, solidarity, and individual self-stereotyping).

Preacher and Hayes (2008) outlined the following advantages associated with using a single multiple mediator model as opposed to multiple single mediator models. First, it allows for an assessment of the combined effect of a set of proposed mediators. Second, the effect of a single mediator can be assessed when taking into account the presence of the additional mediators in the model. Third, it enables comparisons between the magnitudes of the effects that each mediator contributes to the model. And fourth, the potential parameter bias associated with omitted variables (as would be the case when using single mediator models) is eliminated. In addition, the use of the Sobel (1982) test to determine the significance of each mediator is unreliable when using small samples (Preacher & Hayes, 2008). Therefore, a single multiple mediator model will be assessed here, using the SPSS macro devised by Preacher and Hayes (2008). The bootstrapping method with bias corrected and accelerated confidence intervals will be used to test the mediational hypotheses (Preacher & Hayes, 2008). The analysis and bootstrap estimates reported below are based on 5,000 bootstrap samples.

The full multiple mediator model is shown in Figure 8.3. As can be seen, the total effect of condition on positive experience is significant, $c = 0.73$, $t = 3.12$, $p = .007$. However, the direct effect of condition on positive experience is not, $c' = 0.73$, $t = 0.52$, $p = .61$, which indicates that as a set, identity centrality, solidarity and individual self-stereotyping fully mediated the effect of synchronised movement on positive experience. This is further supported by the fact that the difference between the total and direct effects is significant, with a point estimate of .64 and a 95% BCa bootstrap CI of 0.16 to 1.20 (as these values do not contain zero, the effect is significant). When examining the specific contribution of each of the three proposed mediators, it was found that solidarity is a significant mediator of the relationship between condition and positive experience with a point estimate of .45 and a 95% BCa bootstrap CI of .08 to 1.04, as is identity centrality with a point estimate of .27 and a 95% BCa bootstrap CI of .02 to 0.66. Individual self-stereotyping is not a significant mediator of the relationship between condition and positive experience, with a point estimate of -0.07 and a 95% BCa bootstrap CI of -0.34 to 0.02 . A pairwise contrast of the indirect effects of the two significant mediators reveals that solidarity and identity centrality did not differ in terms of the magnitude of

their specific indirect effects, with a point estimate of 0.18 and a 95% BCa bootstrap CI of -0.26 to 0.82 . The direction of the 'a' and 'b' paths of the significant mediators reveals that as hypothesised, synchronised movement significantly increased the groups' feelings of identity centrality and solidarity, both of which then significantly increased the groups' self-reported positive experience associated with being in the group.

8.5 Discussion

The results of this study confirm the prediction that synchronised movement can be associated with an increase in social identification. The groups in the synchronised movement condition scored higher on identity centrality and group solidarity than those in the independent movement condition. However, there was not a significant between-condition difference in individual self-stereotyping.

With regards to positive laboratory group experience, the groups who synchronised their claps reported a more positive experience than did those who clapped individually. This is despite the densely arranged chair configurations. To elaborate on this point, the chairs were arranged at closer proximity than participants may have chosen for themselves in an intra-group context (based on Novelli et al., 2010, study 1, and Chapter 4, study 2 of this thesis). It can therefore be assumed that such close proximity may have induced the negative outcomes sometimes associated with crowding for all of the groups. However, it was shown that synchronised movement affected the groups' experience, leading to higher levels of positivity for those who moved as a coherent unit.

When the relationships between the variables were examined in more detail, it was shown that the effect of synchronised movement on positive group experience was mediated by two of the identity dimensions relating to the relationship between self and the group – centrality and solidarity – but not by individual self-stereotyping, which is not surprising when considering that individual self-stereotyping did not differ between the conditions. The mediating role of identity processes confirms Wiltermuth and Heath's (2009) conclusion that collective joy is not necessary for synchrony to have an effect on group bonding. Instead, it demonstrates that in contrast to McNeill's (1995) position,

collective joy can be an outcome of the group bonding that emerges from synchronised movement as an identity becomes more central to group (or crowd) members and they feel more solidarity with those around them.

Together with the findings of the field research described in the previous chapter, the results from this study support a two-way embodiment model of positive social identity processes in both small groups and large crowds. The findings of both studies, coupled with the work of Novelli et al. (2010) and some of the studies presented in this thesis (see: Chapters 4 and 6) demonstrate the inter-relationship between psychological and physical processes. Using SCT principles, it has been shown that the psychological process of depersonalization can lead people to come together in a space, and that being together in a space, and moving together in time, can operate as a criteria for self-categorization, and hence shared identity. It has also been shown that the sense of unity that ensues from moving as one can account for the collective joy that is so often observed in large gatherings of people, yet rarely addressed by psychological theory.

The finding that synchronised physical movement can work to strengthen the social bond between people raises an important distinction between virtual groups and physically co-present groups. A large body of research has investigated social identity processes in computer-mediated communication (CMC; for a review see Spears, Lea, & Postmes, 2007). It has been shown that CMC can foster a wide range of social identity related phenomena, such as group norm formation (Postmes, Spears, & Lea, 2000) and social support networks (Spears, Lea, Corneliussen, Postmes, & Ter Haar, 2002). However, the two-way embodiment model of social identity presented here can only apply to groups and crowds that are *physically* co-present, which shows that social identification can be strengthened by at least one aspect of physically co-present groups that is absent from virtual groups. That is not to say that a two-way relationship between social identity, virtual space and co-action is inconceivable. In fact, it seems likely that people may be drawn to a (cyber) space such as a common interest forum or message board and that engaging in collective activities in such a space might then feed back and operate as a criterion for self-categorization and any subsequent shared social identity. However, the two-way relationship between the psychological and physical that

has been proposed in this thesis is unique to physically co-present groups and crowds.

In summary then, in combination with the work presented in the previous chapter, this study has supplemented past work (e.g., Cassidy, et al., 2007; Neville & Reicher, 2008; Novelli et al., 2010; The Prayag Magh Mela Research Group, 2007a, 2007b) by showing that social identity can draw people together in a crowd event. However, it has also gone beyond that work by demonstrating the two-way relationship between psychological and physical processes in crowds, and explaining the relationship in terms of SCT. In doing so, it has been shown that collective events are not simply an expression of a particular social identity. Instead, they should be seen as a platform from which social identities can strengthen and evolve as groups come together and unite in synchrony.

Chapter 9: Discussion and conclusions

9.1 Summary of findings

The primary motivation for conducting the research presented in this thesis was to provide a theoretical account of spatiality and crowding, which could account for the inconsistency and confusion that has characterised the crowding literature for more than half a century. As demonstrated in Chapter 2, crowding has been described as something that can happen at the national or neighbourhood level, in the home, in institutions, in physically co-present crowds, or in laboratories. Crowding has been described as a vehicle for pathology, for joy, or even as a vehicle for pathological joy. Theorists have described crowding as a demand for space that could not be met, or as a psychological-evaluative response to density. For some, variable psychological responses to crowding were reducible to individual differences, with the crowd simply serving to amplify pre-existing likes and dislikes. For others, such variation was explained in terms of vast lists of intervening and interacting variables. Crowding was defined *in the context of this body of work* as physical density, and perhaps the clearest and simplest conclusion to draw from the review of the literature, and also from anecdotal and observational evidence, is that despite there being a tendency for some researchers to focus on the negatives, there is no simple, generic response to such density.

The 'personal space' approach to crowding (e.g., Evans & Wener, 2007; Freedman, 1975; Worchel & Teddlie, 1976; Worchel & Yohai, 1979), which stipulates that close physical proximity can elicit a negative response when it is perceived as a violation of the self-other boundary, was introduced as a widely used framework for explaining variable responses to crowding. Whilst the approach makes some sense at first glance, several weaknesses were highlighted and will be briefly recounted here. First, the traditional 'personal space' approach can only account for when close proximity will or will not be experienced negatively, and therefore does not allow for those situations in which close proximity is welcomed or enjoyed. Second, spatial variations (and hence variable responses to crowding) have been explained in terms of a long list of intervening variables (such as individual differences, interpersonal

relationships and setting-environmental factors) as opposed to a unified theoretical framework, resulting in static, unsatisfactory, and often situation-specific accounts of crowding variability. Third, group-level influences on 'personal space' have been framed as fixed, objective, demographic facts (e.g., culture, gender, or 'race'), and as a result, within-demographic variations in spatiality and responses to crowding have been left unaccounted for.

It was argued in Chapter 3 that self-categorization theory (SCT) provides an overarching theoretical framework, which can be used to radically reconceptualise the concept of 'personal space', thus overcoming the problems that are outlined above. SCT describes the self as both a personal and a social concept. According to SCT, when a perceiver self-categorizes according to their personal identity, their interactions will be with other individuals, and hence the spatial zone of selfhood surrounding them will indeed be personal, and violations of that space will be from other individuals. However, when self-categorized according to a *shared* social identity, in-group members will be perceived as an extension of the perceiver's psychological self, and the spatial zone of selfhood will be a group-level construct. Thus, in this case, close proximity to in-group members will not be perceived as an intrusion – instead, it might be welcomed and enjoyed, whilst close proximity to out-group *others* might be perceived as a violation of the self-other boundary and hence the cause of discomfort, anxiety or distress. Importantly, as SCT hypothesises that social identities, and hence group memberships, vary as a function of an interaction between contextual and perceiver variables, there is scope for variation *within* broad demographic groups or categories.

Chapter 4 presented two studies designed to test the most basic spatial hypothesis drawn from SCT; that proximity varies as a function of group relations. In study 1, participants who were divided according to minimal group identities (dot 'over-' and 'under-estimators') were asked to set up a room for a discussion. It was found that participants sought closer physical proximity when their expected interactant was an in-group member as opposed to an out-group member, thus supporting the hypothesis. The experimental paradigm was adjusted slightly for study 2. English participants anticipated interaction with either another English person (an in-group member) or an American (an out-group member). Whilst this design allowed for a further test of the impact of

group relations on proximity, it also presented an opportunity to examine the impact of manipulated difference *within* each group context. It was found that in line with study 1, participants sought closer physical proximity to an in-group member than to an out-group member. Whilst the overall difference between the in-group and out-group conditions was only 1-inch smaller than that observed in study 1, it was not statistically significant. More interesting perhaps is the finding that perceived difference (in terms of stereotypical views of 'Englishness') led participants to seek closer physical proximity when the anticipated discussion was in an in-group context, but to seek greater *distance* when the anticipated discussion was to be with an out-group member. As a result of this interaction, there was not a significant difference in the spatial requirements of participants in the in-group and out-group conditions when they believed that their discussion partner held relatively similar views to them, but there was a significant effect of group context on 'personal space' when the participants' discussion partner was perceived to hold relatively different views to them. Although the absence of a group effect in the 'similar' condition was unexpected, the moderating effect of group condition on the relationship between perceived difference and 'personal space' was interpreted as evidence in support of an active physical process, which might facilitate in-group consensus.

While the studies in Chapter 4 looked at the impact of group relations on the behavioural dimension of so-called 'personal space', the studies presented in Chapter 5 were designed to examine the impact of group relations on the *experience* of close proximity. If, as expected, participants perceive in-group members as an extension of self and out-group members as other (and thus separate from self), close physical proximity to an in-group member should be experienced more positively, and less negatively, than close proximity to an out-group member (because it is less likely to be perceived as a spatial 'invasion'). In a similar experimental paradigm to the one used in the studies presented in Chapter 4, participants were assigned to minimal group categories. In Chapter 5, study 3, participants anticipated discussion with either an in-group or out-group member at either a 'near' or 'far' distance. Contrary to expectations, there was no effect of group context on the participants' self-reported levels of positive or negative affect, regardless of their proximity to their expected

interactant. However, in line with the findings of the studies presented in Chapter 4, participants in the in-group condition expressed a greater desire for close proximity than did those in the out-group condition, thus lending further support to the suggestion that *psychological* proximity can impact on people's desire for *physical* proximity. The lack of an observed effect of group context on subjective affect was attributed to the fact that participants simply anticipated the arrival of an in-group or out-group discussion partner, and consequently only ever experienced close proximity to an empty chair.

The second study of Chapter 5 (study 4) was designed to overcome this problem. Participants were again assigned to minimal groups and then asked to interact with either an in-group member or an out-group member, who was played by a confederate. Whilst participants in the in-group condition reported higher levels of positive affect than did those in the out-group condition, subjective positive experience and affect did not vary as a function of interaction distance, which was contrary to expectations. However, consistent with the results of study 3, when the interaction distance was 'close', participants expressed a stronger desire for closer proximity to the confederate when he was an in-group member as opposed to an out-group member, thus lending further support to the hypothesised relationship between psychological proximity and (desired) physical proximity.

The results of the first four studies presented in this thesis offer evidence in support of the behavioural spatial consequences of self-categorization, and in doing so, are at least suggestive of the fact that close proximity to an out-group member might be experienced as more unpleasant (or less pleasant) than close proximity to an in-group member. However, the studies provided little *measurable* evidence in support of the hypothesised impact of group relations on the experience of close proximity. It was speculated that potential reasons for this may include, (i) as already mentioned, the absence of a physical interactant in study 3, (ii) the fact that the interaction in study 4 was rather fleeting, on a one-to-one basis, and in a sterile laboratory environment, (iii) the novel, and relatively meaningless basis on which the groups were divided in both studies, and (iv) the fact that the manipulation of the minimal group identities was relatively weak in both studies.

Owing to the fact that the impact of group relations on the experience of close proximity was not supported in the studies of anticipated and actual one-to-one interactions (possibly due to the reasons outlined above), the studies that were presented in chapters 6, 7, and 8 began to investigate the potential relationship between self-categorization, group relations, spatiality, and crowding experiences in small groups – and perhaps more importantly in the context of this thesis – large crowds (both real and imagined). To begin with, Chapter 6 presented two studies (studies 5 and 6) which used an experimental paradigm that was adapted from a series of studies by Garcia et al. (2002). Garcia et al. have established a robust paradigm, which has been used to show that simply imagining immersion in a crowd can lead to subsequent helping behaviours that are normally associated with physical co-presence (see also Levine et al., in press). Therefore, it was hypothesised in Chapter 6 that simply imagining immersion in a dense crowd could potentially uncover not only a relationship between social identity and desired proximity in the participants' visualisations, but might also impact upon their mood following the visualisation task.

In study 5, participants were asked to spend a few minutes visualising themselves on either (a) an empty train carriage, (b) a train carriage that was packed full with commuters on their way to work, or (c) a train carriage that was packed full with fans of the participants' favourite band (following a concert). It was predicted that participants who had imagined being surrounded by commuters would not be united with the crowd by a common social identity, whilst those who had visualised being surrounded by fellow fans of their favourite band would be immersed in a crowd of in-group members. As a result, participants in the commuter train condition should have perceived close proximity to the others co-present in their visualisation as a violation of the self-other boundary, whilst those on their way home from the concert should not have experienced any kind of spatial violation due to the perceived status of those co-present as self. It was therefore predicted that following the visualisation task, those who had experienced the self-other violation would report the highest levels of subjective negative affect, whilst those who had visualised close proximity to common category members would report the highest levels of subjective positive affect. These hypotheses were supported.

However, even though it was found participants in the 'commuter' condition and those in the 'concert' condition differing significantly in the extent to which they identified with those present in the imagined crowd, it was impossible to conclude with any degree of certainty that the between-condition differences in affect were indeed the result of differences in identification as opposed to being a consequence of potential confounds in the design. For example, participants in the 'commuter' condition may have reported higher levels of negative affect because they had imagined that they were on their way to work, whereas those in the 'concert' condition may have reported higher levels of positive affect because they had imagined seeing their favourite band, which is most likely to be perceived as a positive, uplifting and exciting experience.

For this reason, a second study was conducted. Although the experimental paradigm was similar to that used in study 5, rather than assigning participants to experimental conditions, all participants were asked to visualise the same scenario, thus allowing for an assessment of the correlations between the critical variables. Having been asked to imagine that they were working as summer interns, participants were asked to imagine that they were due to meet their boss at Wembley Stadium to watch England play in a World Cup qualifying match (the study was conducted during the period of time in which the qualification rounds for the 2010 World Cup were taking place). They were asked to visualise a scene in which they were travelling to the match on a crowded Tube train, surrounded by England fans who were chanting loudly.

Due to the fact that no pre-testing was conducted to establish whether they had any interest in football or going to watch England matches, it was expected that identification with the England supporters would vary across the sample. This would therefore allow for an assessment of the relationship between participants' identification with the crowd and (a) their desired proximity to the others co-present in their visualisations, and (b) their subsequent levels of subjective positive and negative affect. As expected, participants who identified more with the crowd expressed a weaker desire for more space in their visualisation. However, more importantly, social identification was positively correlated with positive affect, but negatively correlated with negative affect when the backdrop to the visualisation was held constant.

Even more interesting, perhaps, was the finding that participants' desire for more space was associated with higher levels of subjective negative affect and lower levels of subjective positive affect in the subsequent task. This lends further support to the proposed relationship between spatial desires and responses to (imagined) density. However, these relationships between desired proximity and affect were fully mediated by the extent to which participants did, or did not, identify with the crowd that they were immersed in. This therefore supports the hypotheses that (a) (imagined) close proximity can elicit negative psychological consequences (in this case affect) when it is to a person or persons perceived as other, and that (b) (imagined) close proximity to a person or persons perceived as self can give rise to positive psychological consequences.

Whilst the findings of Chapter 6 offer strong support for a SCT approach to spatiality and *imagined* crowding, Chapter 7 presented a field study which was designed to investigate the relationship between social identification, physicality and 'collective joy' at a large-scale protest and rally, or in other words, a physically co-present crowd. As predicted, participants at the event reported high levels of both social identification (as NHS supporters) and 'collective joy'. Two mediation models were tested to investigate further the relations between identity, physicality, and 'joy'. It was found that physical location in the crowd partially mediated the relationship between social identity and 'joy'. However, it was also found that the relationship between location in the crowd and 'joy' was fully mediated by participants' social identification with the crowd.

A further finding to emerge from the study described in Chapter 7 was that following a period of potentially synchronised movement (in the form of marching, chanting, and playing musical instruments), participants reported higher levels of (a) shared social identity, and (b) 'collective joy'. In addition, it was found that the change in self-reported 'collective joy' between the two phases of data collection was partially mediated by the observed increase in social identification. This finding provided suggestive evidence in support of the hypothesis that synchronicity might facilitate the depersonalisation process, and in doing so, weaken the boundary between self and other/s, which in turn might increase positive affective responses to physical density.

Although an interesting starting point, the lack of control over critical variables in the field study left the observed link between synchronicity, identity and joy open to the criticism that any increases in identity and joy may have simply been a result of participants spending a sustained period of time together, as opposed to being an outcome of their synchronised physical movement. Therefore, Chapter 8 presented a laboratory study in which participants worked together in extremely close physical proximity to learn a series of clapping patterns, which they were either asked to perform individually or as a synchronised group. It was found that despite the dense physical arrangement of the chairs in the room, participants who synchronised their movement reported a more positive experience of being in the group. In addition, the relationship between synchronicity and positive group experience was mediated by an increase in perceptions of group solidarity and identity centrality. This finding therefore supported the hypothesis that identity formation can operate as a function of physical synchronicity.

9.2 Contributions

The findings to emerge from this body of work make several important contributions to the spatiality, crowding, and social identity literature. First, this thesis has demonstrated that the concept of ‘personal’ space – a concept which has largely framed the self-other boundary as an individual level construct – can, and should, be reconceptualised in line with SCT to allow for the physical boundary between self and other/s to function at the level of groups as well as individuals. In doing so, intra-individual and intra-demographic spatial variations can now be accounted for within a single theoretical framework.

The second contribution of this thesis is closely related to the first. ‘Personal space’, in its traditional formulation, has often been used to explain variable experiences of crowding based on the premise that when close proximity in crowds is perceived as a violation of the self-other boundary, it will be experienced negatively. As this work has now provided evidence of the self-other boundary varying as a function of group-level and social identity processes, it follows that experiences of close proximity and crowding will vary accordingly. In fact, going beyond the traditional personal space approach to crowding, which simply dictates when density will be experienced negatively or

neutrally, the SCT approach can also account for when close proximity will be experienced positively. As SCT frames in-group members as self, it follows that a shared identity might bring with it a sense of solidarity and intimacy, which might make close proximity to strangers a pleasant experience.

As discussed in Chapter 4, these two insights into the impact of group processes on 'personal space' and crowding can be incorporated into mathematical, computerised simulation models of crowd-flow, which are used to assist in the architectural design process when developing public buildings, such as sports stadiums, shopping malls, or stations (e.g. Helbing, Farkas & Vicsek, 2000; Pan, Han, Dauber & Law, 2007). This therefore demonstrates a practical application of the work presented here.

The third contribution of this work also relates to issues of spatiality. Throughout this thesis, the focus has been on the theoretical reconceptualisation of 'personal space' as a variable that can operate at the level of groups as well as individuals, and this reconceptualised view has then been applied to the domains of spatiality and crowding. In particular, the focus has been on why people might seek out and enjoy close proximity in places such as nightclubs, sports stadiums, or even on public transport in some contexts, but might avoid or dislike close proximity in those very same places in other contexts. The central focus has been on ways in which contextual shifts can impact upon the ways in which a perceiver defines themselves and those around them, or in other words, when and why they will come to see others as 'their own kind', and how these perceptions might in turn influence their spatial behaviour. Thus, it has focussed on the fluid nature of self-other relations, and thus, the ability for within-group variability in spatial and crowding behaviours and experiences. However, the SCT approach to spatiality can also shed some light on a related phenomenon that has recently received attention in the social psychological literature; namely, the so-called 'micro-ecology of segregation', which focuses on inter-'racial' spatial relations (Dixon, Tredoux, Durrheim, Finchilescu, & Clack, 2008).

In a series of insightful studies, John Dixon and his colleagues have investigated the ways in which 'racial' segregation occurs in public spaces. In particular, Dixon et al.'s work has focussed on societies with a history of macro-level 'racial' segregation (such as South Africa and the United States of

America), but which are now thought of as desegregated. According to Dixon et al. (2008, p. 1550), as is the case with the broad, macro concept of segregation, “micro-ecological segregation involves the production of social spaces that create, maintain and signify racial separation”. However, Dixon et al. (2008) differentiate micro-ecological segregation from the macro-level segregation that has received a substantial amount of academic attention - the type that might occur in neighbourhoods and societies. According to Dixon et al. (2008, p. 1550): “The micro-ecological dimension, by definition, implicates the scales of social life at which people encounter one another as they are brought into relations of sensuous immediacy, proximity and co-presence”.

One of the most striking findings to emerge from the work of Dixon and his colleagues is that micro-ecological racial segregation occurs in public spaces – which are at first glance – desegregated areas. For example, Durrheim and Dixon (2005) mapped the spatial behaviours of ‘white’, ‘black’, ‘Indian’, and ‘coloured’ people on a beach in South Africa. During apartheid, beaches were specifically allocated as exclusively for the use of ‘whites’ or ‘blacks’. However, post-apartheid South African beaches have become ‘mixed-race’, or in other words, desegregated areas. Durrheim and Dixon found that despite the beaches being accessible to people of any ‘race’, there tended to be racial ‘clustering’ on the beach. In addition, ‘white’ people tended to leave parts of the beach which became heavily populated by ‘black’ people’, thus suggesting their discomfort at being in close proximity to people defined as ‘other’. Similar patterns of micro-ecological segregation have been observed in other public settings such as cafeterias (e.g., Clack, Dixon, & Tredoux, 2005) bars, and nightclubs (Tredoux & Dixon, 2009).

As noted by Dixon et al. (2008), the studies of ‘personal space’ presented in this thesis (see also Novelli et al., 2010) provide a potential explanation of the micro-ecological segregation discussed above. It is easy to see how the link between psychological and physical proximity can be applied to Dixon et al.’s work. Just as participants in the studies presented in this thesis sought closer proximity to in-group members than to out-group members, the people in the bars, restaurants, cafeterias and beaches in South Africa might have represented group boundaries with their use of physical space. It is important to stress here, that this in no way implies that micro-ecological ‘racial’

segregation is *inevitable* – far from it. To suggest such a thing would be a perverse misinterpretation of this thesis, and indeed of the core principles of SCT, which suggests that the psychological boundary between who is self and who is other operates as consequence of an interaction between contextual and perceiver variables, and is hence fluid, and not determined by fixed demographics such as ‘race’. However, in a context in which there exists an historical emphasis on ‘race’ as an important social category, as is the case in South Africa, then it is likely that self-categorizations and social identities will often be determined according to ‘racial’ divides. As such, when a ‘white’ or ‘black’ identity is salient, it follows that members of other ‘racial’ groups will be perceived as ‘other’ and members of the in-group will be perceived as ‘self’, and that subsequent physical boundaries between ‘races’ might reflect this.

The ability for SCT to enhance our understanding of spatiality and crowding has been highlighted extensively throughout this thesis. However, this work also contributes to our theoretical understanding of identity and group processes. Most notably, this thesis has highlighted the inter-relationship between psychological and physical processes, and hence points to a two-way embodiment understanding of social identification. Put differently, this body of work has demonstrated that whilst self-categorizations can play an important role in determining the organisation of bodies in a space, it has also shown that the organisation of bodies in space, and the synchronisation of those bodies in time, can feed back and influence self-categorizations (see also, Cassidy et al., 2007). The field study presented in Chapter 7 pointed to this inter-relationship in a naturalistic setting. However, perhaps the clearest examples of a two-way relationship between self-categorization and physicality can be found in the first and the last of the laboratory studies presented in this thesis. The first (Chapter 4, study 1) showed that self-categorizations can have an impact on participants’ physical orientation to a discussion partner, whereas the last (Chapter 8) showed that physical synchrony can lead to a shift in how people categorize themselves and others, and how this in turn can impact upon the experience of close physical proximity to a group of strangers.

Whilst this ‘return path’ from physicality to identity sheds some light on the potential two-way relationship between psychological and physical processes, it also makes an important contribution as a stand-alone finding. To elaborate,

there has recently been a fascinating body of work that was designed to investigate the mechanisms underlying social identity formation – particularly in small groups. According to Postmes, Haslam and Swaab (2005), social identity formation operates via two routes, which they refer to as *deduction* and *induction*. Deduction is seen as a top-down process, in which ‘social “realities” existing in the social structure’ (Postmes et al., 2005, p. 8) inform group members’ shared understanding of what it means to belong to a particular social category. The authors cite the consensualisation literature as a good example of this top-down process (see Chapter 4 for a detailed discussion of consensualisation). To elaborate briefly, Haslam and his colleagues have shown in a series of studies (e.g. Haslam et al., 1998, 1999) how stereotypical views of both an in-group and an out-group can become consensualised following a period of intra-group discussion. Importantly, this effect is most evident when participants are asked to discuss these stereotypes in an *inter-group* context, thus demonstrating the way in which inter-group comparisons can aid social identity formation (as a slight digression, it is worth pointing out here that Chapter 4, study 2 has contributed to our understanding of the way in which *physical* processes might facilitate this active consensualisation process).

Induction, on the other hand, is seen as a bottom-up process, in which the actions of individuals *within* a particular group help to formulate a social identity (Postmes et al., 2005). Importantly, this process can operate in the apparent absence of an explicit out-group to serve as a frame of reference – that is, it can be an intra-group process. As noted by Postmes et al. (2005), research examining interactive small groups has been rather sparse. This is, in part, a consequence of the well-documented problems associated with the analysis of data from such studies (see McGarty & Smithson, 2005). However, Postmes et al. (2005, p. 25) cite a series of studies which have demonstrated that social identification can be strengthened following a period of intra-group discussion and the shared cognition that such discussion fosters (Swaab, Postmes, Spears, van Beest, & Neijens, 2005; see also Swaab, Postmes, van Beest, and Spears, 2007).

Whilst there is no doubting the value of this finding in terms of its ability to demonstrate the inductive route to identity formation via intra-group discussion, Chapter 8 in this thesis contributes further to our understanding of this ‘bottom-

up' route to social identity formation. To elaborate, the study described in Chapter 8 demonstrated that synchronised physical movement could strengthen participants' sense of social identification with the group. To be more specific – synchronicity enhanced participants' feelings of group solidarity and made the identity more central to them (in comparison to participants who did not synchronise their movement). Prior to their participation in the clapping task, participants in both the synchronised movement condition and the individual movement condition were involved in a period of group discussion to (a) interpret the clapping patters, and (b) decide how they would work as a group in order achieve the optimal performance in their subsequent 'assessment'. Thus, the finding that those in the synchronised condition felt a stronger sense of group identity than did those in the individual movement condition demonstrates that social identity can be induced via physical synchronisation, and that this effect can operate *above and beyond* the effect of intra-group discussion.

Now that the core contributions of this work have been outlined, the final section of this chapter will outline some potential avenues for future research into the SCT approach to spatiality and crowding. In some cases, this future work could be conducted to address the potential limitations of this thesis, but in other cases, the suggested work could be used to expand the application of SCT to crowding and spatiality.

9.3 Limitations and directions for future research

Although the following section marks the end of this thesis, it should be seen as just the end of the beginning of the development of the SCT approach to spatiality and crowding. The current body of work has answered some early questions, and has provided some important insights relating to the efficacy of SCT as an explanatory tool in crowding and spatial work. However, it has been impossible to answer all of the questions that will inevitably emerge from this novel theoretical application, and as such, this thesis opens up several interesting avenues for future work, which will be briefly discussed below.

Beginning with the application of SCT to spatiality, the impact of group relations on so-called 'personal space' was strongest when minimal groups were used – that is, when the groups were relatively meaningless to their members, with no history of interaction between them. When national identities

(English and American) were used, the group effect on space was somewhat reduced (although, still evident). As it can be argued that the United States of America and England have a history of alliance and cooperation, it becomes reasonable to suggest that this may have influenced this weakened group effect on spatiality – that is, participants might have felt that it was normative to cooperate with an American, and thus normative to sit relatively close to them. However, this interpretation can be seen as nothing more than speculation at present. As such, one possible avenue for future work might be to investigate how different group relations (e.g., hostile versus harmonious) can impact upon spatiality. The nature of these relationships could be either perceived social realities (e.g., national identities with a history of hostility or cooperation), or experimentally imposed, thus opening up a wide range of potential variations on the ‘personal space’ paradigm developed in this thesis.

Further work could also be conducted to provide further evidence in support of the idea that contextual shifts can impact upon the inclusiveness of group boundaries, and that this in turn can impact upon spatiality. For example, it has been argued that close physical proximity to a particular person or group of people might be avoided or experienced as unpleasant when they are perceived as out-group members, but that close proximity to that very same person or group of people might be actively sought and enjoyed when they are perceived as in-group members in a different context.

One potential way of examining this would be combine the ‘personal space’ paradigm described in this thesis with a research paradigm used by Levine et al. (2005). Levine et al. found that in a context which made participants’ social identity as Manchester United fans salient, they were more likely to offer help to an ‘injured’ person if they were wearing a Manchester United shirt (in-group) as opposed to those wearing a Liverpool FC shirt (out-group), or a non-branded sports shirt. However, in a context which made participants’ social identity as *football fans* salient, Manchester United fans were just as likely to offer help to Liverpool fans (despite their historical status as rivals) as they were to offer help to those wearing Manchester United shirts. The ‘injured’ person wearing the non-branded sports shirt was least likely to be offered help. Thus, a study could be conducted to investigate whether (a) fans of a particular team (e.g., Manchester United) seek closer proximity to fellow

fans of their team than to fans of a rival team (e.g., Liverpool) in a context which makes their team identity salient, and (b) whether fans of the same team (Manchester United) seek closer proximity to 'rival' fans (Liverpool) than to people who dislike football in a context which makes their identity as football fans salient.

Despite the strengths of the 'personal space' paradigm developed in this thesis (and Novelli et al., 2010), experimentally manipulating social identities and group relations and then asking participants to arrange chairs for a discussion, is of course, just one way of testing the SCT approach to spatiality and crowding. One of the main appeals of the paradigm is that participants remained unaware that their spatial preferences were the focus of study – thus providing an ecologically valid measure. However, future researchers should consider developing methods for investigating spatial behaviours that require no intervention from researchers, and that can also be applied in field settings. For example, in a similar vein to the work conducted by Dixon and his colleagues, cameras could be used to 'map' the physical relations of people in various in-group and out-group crowds. Although the field study described in Chapter 7 began to examine spatial relations in an in-group crowd, one of its limitations lies in the fact that the measure of proximity was based on participants' self-reports, which may or may not have reflected their actual physical relations with the others present in the crowd. Whilst the self-reports correlated with the researcher's estimations of proximity, it could also be argued that the researchers' estimations may have been inaccurate. Therefore, combining a 'mapping' technique with self reports would not only allow for objective measures to be taken of the distances that people seek from one another, but would also allow for an assessment of the extent to which people's self-reports of proximity reflect their actual physical relations with their fellow crowd members.

Future fieldwork should also be conducted to further investigate the hypothesised relationship between perceived self-other violations (i.e., in inter-group and interpersonal crowding contexts) and negative psychological outcomes (such as increased negative affect). Much of the work described in this thesis certainly points to such a relationship, with the most lucid example being the visualisation studies in Chapter 6, which revealed a direct link

between crowding, identity and both positive and negative affect. However, a limitation of this thesis is that the evidence is limited to one-to-one interactions and visualised crowds. Whilst it is certainly true that the field study discussed in Chapter 7 uncovered a relationship between identity processes and affect in physically co-present crowds, the focus remained on *in-group* crowding and *positive* affect. Therefore, future work should focus on the potentially negative outcomes associated with immersion in a crowd of people with whom a perceiver does not identify. It is however, certainly the case that recruiting participants for such studies on an ad hoc basis would be challenging, if not virtually impossible. For example, if one were interested in crowding experiences in crowds that are comprised of individuals – such as commuters travelling to work – distributing questionnaires on a crowded train would be a logistical challenge, and to expect commuters to fill in questionnaires when they can barely move would be unreasonable. On the other hand, if one were interested in the experience of immersion in an out-group crowd, it would be simply impossible to go into a crowd and to expect to find ‘out-group’ members. Therefore, researchers interested in this area would be advised to recruit participants prior to conducting their studies and to then ask them to immerse themselves in various crowds and to either (a) report their experience (this could be done either as a running commentary to an accompanying researcher, or retrospectively by taking part in an interview or completing a questionnaire), or to (b) wear apparatus such as a heart-rate monitor to allow for an assessment of physiological arousal. It could also be argued that an even better solution would be to triangulate the research methods by combining each of these approaches.

Whilst this thesis has focussed on the ways in which close proximity and crowding can increase positive and negative affect, another potentially interesting avenue for future work could be to examine the ways in which immersion in an in-group crowd might serve to actively *reduce* stress. A large body of work has begun to uncover the ways in which social identity can impact upon the experience of stress and how people react to stressful experiences (e.g. see Haslam, Jetten, O’Brien, & Jacobs, 2004; Haslam & Reicher, 2006). In short, it has been shown that (a) both the content and normative aspects of a social identity can shape the ways in which group members appraise stressful

situations, and that (b) when a social identity is salient, in-group members can serve as a social support network, thus reducing the impact of stressful situations. For example, in an elaborate study that was conducted as part of a BBC documentary, Haslam and Reicher (2006) created a 'prison' and assigned participants to the social categories of 'prisoners' and 'guards'. In support of the notion that social groups can serve as a social-support unit, it was found that for participants in the 'prisoner' group, an increased sense of shared social identity led to an enhanced ability to cope with stressful situations, such as experiencing poor living conditions. However, for participants in the 'guard' group, an inability to develop a sense of shared identity, and thus the absence of a social support network, was associated with an inability to cope with stressful situations such as being bullied by the prisoner group. In an earlier study, Haslam, O'Brien, Jetten, Vormedal, & Penna (2005) demonstrated the potential for past experience and also the normative aspects of a particular work-based identity to influence the degree to which a situation was perceived to be stressful. To elaborate, whilst bomb disposal officers viewed their work to be less stressful than that of bar staff (and vice versa), neutral participants (students) consistently valued bomb disposal work to be more stressful than bar work, thus demonstrating the subjective and group-based nature of stress.

When bearing these findings in mind, it certainly seems feasible to suggest that social identity processes might actively reduce feelings of stress in crowds. For example, a crowd of football fans – united by the common social identity that is associated with a particular team – might experience a tense match or defeat as stressful or upsetting, especially if the defeat were to a hostile rival, thus threatening the status of the in-group. Whilst a fan watching the match in isolation (i.e. on television) would have to experience the stress alone, for a fan in the crowd, fellow supporters might provide a social support network. This social support could come in many forms. First, a crowd of fans might act as a point of reference for one another so that they can strive for consensus on how to feel and who to blame. Second, the crowd might provide its individual members with the ability to be heard via the medium of collective chanting, which in turn could give rise to a sense of collective empowerment, which could be of particular importance if the source of stress was a group of taunting opposition fans. Third, the crowd could simply converse to reassure and

console one another. Of course, each of these predictions are speculative at present, thus demonstrating the need for future work in this area.

The final potential avenue for future work to be outlined in this thesis relates to the finding that synchronised movement can facilitate the depersonalisation process and aid social identity formation. Despite the strength of this finding, it must be acknowledged that it is fairly limited in its scope, and is therefore deserving of further attention. For example, the link between physical co-ordination and identification is currently limited to perfectly synchronised clapping. Future work could examine whether moving *in time* to a beat, but not necessarily in perfect synchrony (i.e., clubbers dancing to beat-heavy music) might have a similar impact on the way in which people see themselves and others, although perhaps to a lesser extent. In a similar vein, work could be conducted to look at the impact that *asynchronous* movement might have on social identification. In the study described in Chapter 8, comparisons were made between people who moved as individuals and those who moved as a synchronised unit. Thus, future work could include an experimental condition in which participants are asked to move at the same time, but not *in time* with one another. On the one hand, it could be predicted that participants in the asynchronous condition might identify with each other the least due to the resulting cacophony that might be associated with disjointed clapping. On the other hand however, a more plausible prediction might be that those in the asynchronous condition might identify more than those in the individual movement condition. For example, spectator crowds often applaud as a show of appreciation, and although such applause is really synchronous, it is unlikely to decrease feelings of shared identity – perhaps the simple production of noise can increase identity via the process of collective empowerment. However, it would seem sensible to predict that those in the synchronised condition would identify the most due to the feelings of solidarity and identity centrality that emerges from moving as one. However, these are all questions that require further empirical attention.

Whilst undoubtedly interesting, all of these potential directions for the SCT approach to spatiality and crowding are for the future. For now, it is time to draw this current body of work to a close. In sum, this new application of self-categorization theory to the field of spatiality and crowding has provided some

important insights into the impact that social identities and group relations can have on when and why we want to be physically near to, or far from others in one-to-one interactions, small groups, or in crowds – be them real or imagined. It has shown that social groups can be represented physically as well as psychologically. In doing so, an explanation has been provided as to why situations of close proximity and density can sometimes be experienced as unpleasant and stressful and thus avoided, but at other times sought out and enjoyed. However, this work has gone even further by demonstrating that collective events are not simply an expression of an existing social identity. Instead, they should also be seen as a platform from which social identities can strengthen and evolve as groups congregate and unite in synchrony. Taken together, these findings mark the first steps towards developing a two-way embodiment understanding of social identity processes.

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Appendix 1: Chapter 4, study 1 – participant brief

Research background

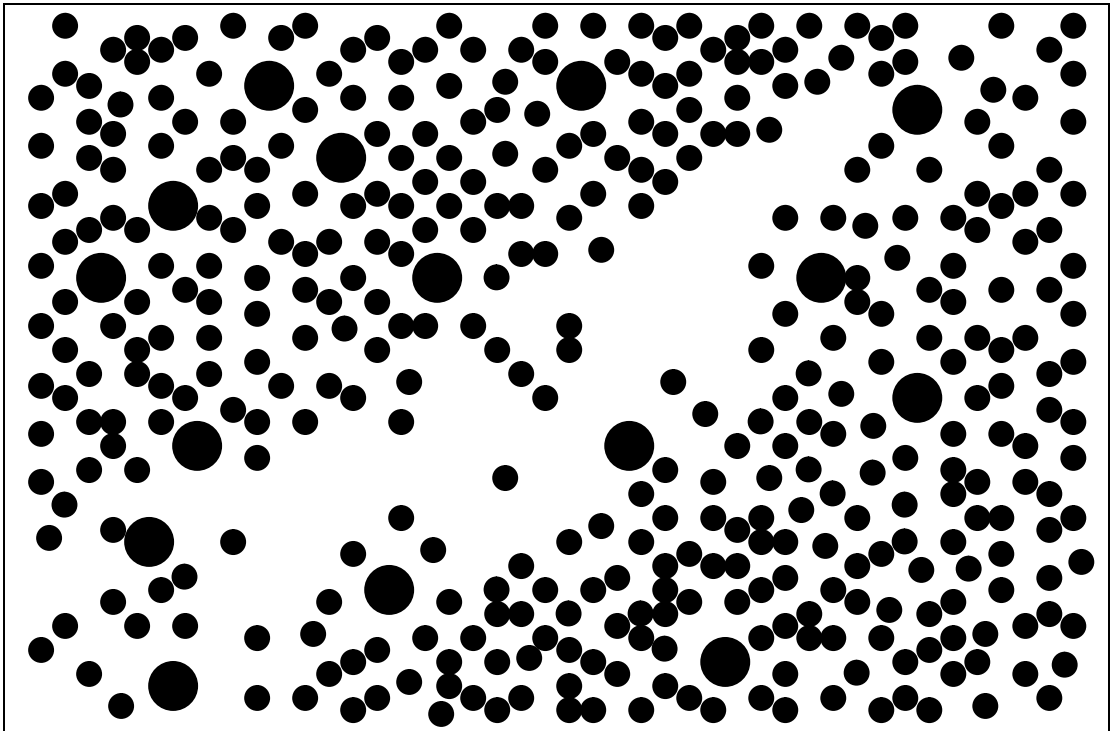
According to Hoffman and Routledge (2004), people can be reliably divided into two cognitive categories: dot over-estimators and dot under-estimators.

Following a series of studies, Hoffman and Routledge (2004) concluded that these two groups are distinguished by several differences. For example, variation between the groups on the dimensions of analytical problem solving ability, degree of cognitive bias, literacy, mathematical ability, and social competence, have all been identified.

Building on the idea that there is a relationship between cognitive style and social competence, this study is being conducted to identify whether members of the cognitive categories differ in their communication styles in a variety of contexts – e.g., when interacting with members of the same or different cognitive categories. Therefore, you will be assessed in order to distinguish whether you are a dot over-estimator or a dot under-estimator. You will then be asked to fill in a typicality measure. Finally, you will be asked to have a short discussion with another participant so that your communication style can be observed.

If you wish to know more about the differences between these cognitive categories, feel free to ask me questions on completion of this study. Alternatively, you can see:

Hoffman, R. J. & Routledge, B. (2004). Dot estimation style as a predictor of social and mental competence. *Applied Cognitive Psychology*, 17, 569-592.

Appendix 2: Example dot matrix

Appendix 3: Chapter 4, study 1 – ‘typicality’ measures

1) Imagine you are in a casino. You started the evening with £50 and planned to leave with no less than £30 because you had planned to buy a gift for a friend costing £30 the following day. In your excitement, you got slightly carried away and having checked your wallet you are alarmed to discover that you only have £15 left. However, you notice a blackjack table and realise that the odds are 2-1, and you therefore have a chance of winning your money back. Would you:

- a) Count your losses and leave the casino £15 down.
- b) Bet £5 of your remaining money.
- c) Bet £10 of your remaining money.
- d) Bet all of your remaining money.

2) You are in central London and have an important job interview in half an hour. You are running late and the office you need to get to is a forty-five minute walk from where you are. It's rush hour so it is hard to say how long a taxi might take, so you decide to take the tube, which should take around ten minutes. You are waiting on the platform when the announcer declares that there is a fault on the line and all trains will be delayed. They state that normal service *should* resume but do not specify when. Would you:

- a) Walk to the interview, think of an excuse and turn up late.
- b) Wait five minutes to see if the trains start running, then walk if they do not.
- c) Wait ten minutes to see if the trains start running, then walk if they do not.
- d) Go outside, try to hail a taxi, and hope that the traffic is not too bad.

3) You've been invited to a friend's party and you've been looking forward to it for weeks. To your dismay, on the morning of the party your lecturer reminds you of a deadline the next day that you had completely forgotten about. At a push, you would be able to finish the work if you stayed in and worked through the night. Would you:

- a) Call your friend, apologise, and let them know that you can't make the party.
- b) Go to the party, forget about the assignment, and accept that you'll lose out on the marks.
- c) Work for half of the evening and catch the end of the party and then try to get the assignment in 24 hours late and lose ten percent.
- d) Fake illness and try to get deadline extension.

4) A coat you've been admiring for months turns up in the January sales. It's half price and sure to be sold before long. However, it still costs £150. You've reached your overdraft limit and you have several bills to pay.

Would you:

- a) Forget about it. There's no way you can afford it.
- b) Put it on your credit card and worry about it at a later date.
- c) Try to do some extra shifts at work during the week and see if the coat is still on offer next week.
- d) Buy a different, cheaper coat to make yourself feel better.

5) You've just moved into a new house. At your housewarming party, your best friend stands up to make a speech. During the speech, they present you with a painting that they have been working on for months and say that they would be honoured if you would hang it in your new home. It's a portrait of you, and you hate it.

Would you:

- a) Put it on the wall just to keep your friend happy.
- b) Smile, take the painting, and decide you'll only hang it when your friend visits.
- c) Be honest with your friend and tell them you don't like it.
- d) Say that you can't accept something that your friend has worked so hard on.

6) Imagine you've been to a pub several miles from home with a group of colleagues from your new job. You've lost track of time and realise that you've missed the last train home. A taxi will cost you at least £30 but you have no money left. Your new boss offers you a lift home. He looks sober but you know he's had a few drinks and may be over the drink-drive limit.

Would you:

- a) Accept the offer of a lift and hope your boss isn't too far over the limit.
- b) Risk offending your boss by declining his offer, and then ask a colleague to lend you the £30 for a taxi.
- c) Risk offending your boss by declining his offer, and prepare yourself for the several hour walk home.
- d) Suggest to your boss that he's over the drink-drive limit and that you'll report him if he drives his car.

7) In your opinion, which of these inventions has changed the world the most?

- a) Air travel.
- b) The Internet.
- c) Mobile phones.
- d) Television.

8) If you were never able to use one of the above again, which would you choose?

- a) Air travel.
- b) The Internet.
- c) Mobile phone
- d) Television.

9) Which of these clichés do you agree with the most?

- a) What goes around comes around.
- b) Always look on the bright side of life.
- c) Que sera, sera.
- d) When it rains, it pours.

10) You listened to a piece of music at the start of this task. How long do you think it was?

- a) 2 minutes 36 seconds.
- b) 3 minutes 6 seconds.
- c) 3 minutes 36 seconds.
- d) 4 minutes 6 seconds.

Appendix 4: Chapter 4, study 2 – list of traits

Intelligent	Suave
Brilliant	Courteous
Scientifically-minded	Conventional
Witty	Argumentative
Sophisticated	Straightforward
Alert	Slovenly
Shrewd	Suspicious
Sly	Reserved
Meditative	Quiet
Imaginative	Stolid
Stupid	Ponderous
Ignorant	Stubborn
Superstitious	Impulsive
Naive	Quick-tempered
Industrious	Suggestible
Lazy	Passionate
Honest	Sensual
Deceitful	Pleasure-loving
Unreliable	Jovial
Evasive	Happy-go-lucky
Faithful	Humourless
Treacherous	Sensitive
Cowardly	Methodical
Cruel	Neat
Kind	Persistent
Generous	Imitative
Grasping	Frivolous
Mercenary	Gregarious
Materialistic	Practical
Revengeful	Progressive
Quarrelsome	Conservative
Gluttonous	Musical
Pugnacious	Artistic
Aggressive	Sportsmanlike
Conceited	Tradition-loving
Boastful	Efficient
Ambitious	Very religious
Ostentatious	Extremely nationalistic
Individualistic	Physically dirty
Talkative	Loyal to family ties
Loud	Arrogant
Rude	Radical

Appendix 5: Positive and Negative Affect Schedule

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way RIGHT NOW, that is, at the present moment. Use the following scale to record your answers.

1	2	3	4	5
Very slightly or not at all	A little	Moderately	Quite a bit	Extremely

_____interested

_____irritable

_____disinterested

_____alert

_____excited

_____ashamed

_____upset

_____inspired

_____strong

_____nervous

_____guilty

_____determined

_____scared

_____attentive

_____hostile

_____jittery

_____enthusiastic

_____active

_____proud

_____afraid

Appendix 6: Chapter 5, study 3 – Participant brief

Research background

According to Hoffman and Routledge (2004), people can be reliably divided into two groups, based on their estimation style.

Following a series of studies, Hoffman and Routledge (2004) concluded that members of these two groups are distinguished by several differences in their cognitive styles. For example, variation between the groups on the dimensions of analytical problem solving ability, degree of cognitive bias, literacy, mathematical ability, and social competence, have all been identified.

Building on the idea that there is a relationship between cognitive style and social competence, this study is being conducted to identify whether members of these groups vary in their perceptions of social situations, and whether or not their performances in social interactions differ in a variety of contexts – e.g., when interacting with members of the same or different group to themselves. Therefore, you will first be assessed in order to determine which of the groups you belong to, and to determine whether or not you are a typical member of the relevant group. You will also be asked to fill in two questionnaires, before and after a short discussion with another participant.

You won't find out which of these groups you belong to until the study is completed. However, for the benefit of the experimenter, your group will be represented by a colour – either blue or red.

If you wish to know more about the differences between these groups, feel free to ask me questions on completion of this study. Alternatively, you can see:

Hoffman, R. J. & Routledge, B. (2004). Cognitive style as a predictor of social and mental ability. *Applied Cognitive Psychology*, 17, 569-592.