

Multiple group membership and individual resilience and well-being: The impact of social identity complexity, stigmatization and compatibility

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(Signature).....

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Abstract

A growing body of research points to the value of multiple group memberships for individual well-being. However, much of this work considers group memberships very broadly and in terms of number alone, and in so doing, advances an argument that when it comes to group memberships, more is better. We conducted five studies to delve further into this idea. Specifically, across these studies we considered how different features of groups may impact on how group memberships combine with one another and affect individual well-being. In two correlational studies, we found that multiple group membership indeed contributed to well-being, but also that this effect was moderated by the distinctiveness of those groups within the overall self-concept (Study 1), and by the social value and visibility of individual group memberships (i.e., stigma; Study 2). In both studies, these effects were mediated by perceived access to social support and by the reported ability to engage in identity expression (i.e., to communicate to others who one “really is”). Across another three studies we experimentally demonstrated that multiple group membership increased well-being and resilience to stress (Study 3 and 4), but only when the given groups were perceived as compatible in nature (Study 3 and 5). Together, these studies suggest that the benefits of multiple group membership depend on factors that go beyond their sheer number. Indeed, the content and social meaning of group memberships, individually and in combination, and the way in which these features guide self-expression and social action, determine whether multiple group memberships are a benefit or a burden for individual well-being and resilience.

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Chapter 1

Introduction

Overview

In the past century, the order of Western society has been in a state of constant flux with new ideologies and social movements persistently redefining traditional social hierarchies – including, for example, female suffrage and equal rights for minorities (Bordo, Taylor, & Williamson, 2007). Similarly, the industrial revolution has contributed to a more diverse societal landscape, with ever-evolving technological innovation continually facilitating greater physical and virtual (e.g., via the internet) access to cultures and countries that were previously beyond the reach of the average person. It is now easier than ever before to move between nations and to live abroad, and be it for reasons of lifestyle or employment, famine or political unrest, doing so is rapidly becoming the norm rather than the exception (UN, 2009). These global changes have brought people of different creeds and cultures together, and continue to create social connection where there was none before (Bordo et al., 2007; Crisp & Hewstone, 2006). In other words, the social world in which we live has become infinitely more complex than in the past and continues to develop in this direction.

In the context of such an increasingly dynamic and multi-faceted society, individuals now identify and express themselves in terms of much broader and more shifting arrays of social identities (Crisp & Hewstone, 2006). For example, being bicultural, having an ethnically diverse background, or identifying with a minority religion, is now much more common than in the past when self-definitions tended to be embedded within stable, local settings (Ashworth, Graham, & Tunbridge, 2007; Barker, 1999; Karner, 2011). Similarly, the movement of individuals across

traditional social boundaries, such as ethnic minorities into particular (non-traditional) professions, has challenged rigid distinctions and further contributed to the creation of new hybridized identities. A case in point, as the first African-American president of the USA, Barack Obama redefined the traditional idea of the American presidency – that is, as a post reserved for White Americans.

A central argument of this thesis is that the increase in the number and types of social groups and identities that people can inhabit has implications for individual functioning (Jetten, Haslam, & Haslam, 2012). Indeed, multiple group membership has already been shown to enrich self-definition and to contribute to enhanced well-being, with a number of studies suggesting a linear-type relationship between the number of group memberships and a range of well-being indicators (Binning, Unzueta, Huo, & Molina, 2009; Iyer, Jetten, Tsivrikos, Postmes, & Haslam, 2009; Jetten et al., 2014; Jetten et al., 2012; Jetten, Haslam, Pugliese, Tonks, & Haslam, 2010; J. M. Jones & Jetten, 2011). Connecting and identifying with multiple, diverse social groups thus appears to be fundamentally a good thing. However, the exact mechanisms through which these effects on well-being are transmitted are somewhat unclear and not necessarily straightforward. Indeed, theoretically, belonging to multiple groups may equally lead to complications of identity as the individual tries to combine and balance membership in novel and disparate social categories. For instance, past research has suggested that if the groups with which the individual identifies conflict (e.g. being gay and Catholic) or are socially devalued in some respect (e.g. being an ethnic minority), the material and psychological difficulty of belonging to such groups may detract from his or her well-being rather than contribute to it (Brook, Garcia, & Fleming, 2008; Jaspal & Cinnirella, 2010). In this way, belonging to multiple groups may not always be a positive experience or psychologically beneficial. However, the extent to which the association between multiple group membership and

well-being is actually influenced by such other factors is empirically under-explored and theoretically under-developed. It is this gap in the research that the present thesis aims to fill.

In this chapter and the next, we present a rationale for the systematic empirical investigation of the specific processes and mechanisms that may enable or undermine the previously observed relationship between multiple group membership and individual well-being. To do this, we draw on a number of key social psychological theories. The following sections of this chapter will provide a description of the elements of the *social identity approach* (SIA), which provides a basis for understanding the psychological place of (multiple) social groups within the individual's sense of identity (Tajfel & Turner, 1979). While the SIA has traditionally focused on questions of intergroup attitudes and behavior, a developing trend in social identity research relates to health and well-being consequences of group membership (Jetten et al., 2012). As such, after describing the SIA and providing a fundamental theoretical context for the current thesis, we then specifically turn our focus to the link between group membership and individual well-being. Here, we discuss the paths through which group identification is thought to benefit the individual, and outline and discuss the budding research indicating that the rewards of *multiple* groups seem to accrue to contribute to well-being.

Against this backdrop, we then narrow the focus in Chapter 2 and consider two different bodies of literature for understanding how multiple group memberships combine and interact to affect the self. First, we draw on theories of social identity complexity (M. B. Brewer, 2010; Roccas & Brewer, 2002), which highlight how the descriptive characteristics of groups – that is, their membership overlap or distinctiveness – shape the social psychological consequences of these. The basic argument put forward in this literature is that it is membership in multiple *distinctive* groups

(i.e., high social identity complexity) that has social, and potentially psychological, benefits (Roccas & Brewer, 2002). However, research in this tradition has primarily focused on consequences for intergroup relations, leaving questions of individual well-being unanswered (Brewer, 2010). Next, we move on to theories that have discussed how the content and meaning attributed to social groups (by both the self and others) defines the experience and implications of group memberships for the individual. In particular, we explore the literature on identity stigma and compatibility. Broadly, this research highlights how the social value of categories, and the specific meaning (e.g. in terms of status or stereotypes) associated with different groups, can be sources of psychological stress that the individual needs to navigate. There is, however, only little reference to such findings in the multiple group literature. Finally, on the basis of these different streams of research, we develop hypotheses about the specific factors and mechanisms that might determine the psychological costs and benefits of multiple group membership, and subsequently present a series of studies in the ensuing chapters that test these ideas empirically.

(Multiple) group memberships and the self: The Social Identity Approach.

Identity has been conceptualized in numerous ways across a variety of academic fields, including philosophy (Parfit, 1971), sociology (Rutherford & Angela, 1990), and psychology (Onorato & Turner, 2004). In principle, identity relates to the way in which we define and construe ourselves and others, and how we act and are perceived on the basis of this understanding. It is the internalization and expression of the characteristics and tendencies that develop over the course of a lifetime as a result of environmental factors and biological personality traits (Weinreich & Saunderson, 2005). For example, we may be distractible, inclined to look on the bright side of life,

be a social democrat, and an avid fan of the New York Yankees. All of these characteristics guide cognition and behavior and tell others something about who and what we are (Weinreich & Saunderson, 2005). Thus, broadly speaking, we can understand identity based on those abilities and attitudes, opinions and values that we cultivate and refine over time as individuals, and that feature centrally and with temporal consistency in our lives.

While some have specified this definition of identity in terms of the idiosyncrasies that make each of us unique, thus generally referring to a *personal identity* (Linville, 1985), alternative ideas include an understanding of the self as something that is also based on the values, attitudes and beliefs that we source from and share with others. Thus, it is not only our unique features that define us, but also the characteristics that we have in common with others and that identify us as belonging to a group. This latter perspective on identity includes the ideas of *social identity theory* (SIT)(H. Tajfel, 1982; H. Tajfel & Turner, 1979) and *self-categorization theory* (SCT)(Turner, Hogg, Oakes, Reicher, & Wetherell, 1987; Turner & Oakes, 1989), which together comprise the *social identity approach* (SIA). With its focus on the role of group membership in the individual self-concept, and the socially defined meaning and content of the associated identities, the SIA represents a comprehensive theoretical framework for exploring the effects of group memberships on cognition, emotion, and behavior. The SIA thus encompasses a basic theoretical context for this thesis.

Social identity theory (SIT) takes root in the basic assumption that, in many contexts, people tend to define themselves in terms of the social groups to which they belong, and that cognition and behavior is informed by this categorization. As well as defining the social boundaries of the self, social identities contain information about the common and shared characteristics of group

members, prescribing certain behaviors and norms and prohibiting others (Tajfel, 1982; Tajfel & Turner, 1986; Hogg & Reid, 2006). For example, identifying in terms of gender, religion, or nationality involves adhering to, or being influenced by, the content and social expectations of these group memberships that have developed through time to describe what it means to, for example, be a woman, a Muslim, or a Norwegian. Social identity can thus be viewed as the individual's embodiment, endorsement, and expression of the common features of a social category. In other words, it involves enacting and thinking of the self in terms of *we* and *us* rather than *I* and *me* (H. Tajfel & Turner, 1979).

The outcomes of this type of social identification are manifold. Group memberships, and the social identities these entail, provide a place for us in the social world and link us with similar others. These socially shared understandings allow us to develop friendships, integrate with social networks, and give us a sense of who we are. However, self-definition derived from group membership also comes from emphasizing who and what we are not (H. Tajfel & Turner, 1979). Indeed, a fundamental tenet of the theory pertains to the individual's need and desire to maintain a positive sense of self by differentiation from others (H. Tajfel & Turner, 1986). That is, in situations where a particular social identity is salient, people may endeavor to achieve and maintain a positive self-definition by favorably distinguishing their own group from relevant others – for example through biased comparisons or more explicit social competition with outgroups (H. Tajfel & Turner, 1986). This idea was demonstrated in Tajfel and colleagues' (1971) *minimal group studies*. Here, participants were randomly divided into two fictional groups, which were then observed engaging in intergroup behavior in the form of points allocations between anonymous members of one's ingroup (the group to which the participant belongs) and the outgroup they believed also existed. The key finding was that even under these very minimal circumstances, in which the group had no

history or other reality, and in which the individual could not personally benefit in any material way, individuals nonetheless displayed bias in favor of their own group members. To explain this, Tajfel and colleagues invoked the idea of positive intergroup differentiation as an important motive for the socially defined self. While these studies were initially used to explain the genesis of intergroup bias and conflict, they also signify the importance of social identity more generally in social cognition and behavior. Specifically, they show that people's sense of self and their individual social experience and action is often defined by the groups to which they connect and belong.

The theoretical concepts proposed in SIT are further developed in self-categorization theory (SCT; Turner et al., 1987), with a focus on the socio-cognitive mechanisms that facilitate group-based self-definition and behavior. Specifically, SCT highlights the way in which individuals interface with their social environment, how this can differ depending on the basis of our group memberships (e.g. *British* or *athlete*), and how this in turn can influence the nature of individual interaction with others (Turner et al., 1987). Acknowledging the fact that people typically have multiple social identities, SCT asserts that the salience (and resultant influence on cognition and behavior) of a given identity is dependent not only on the centrality of that identity in the self-concept, but also on the situation in which the individual is positioned. For example, someone who identifies strongly with the social categories of *soccer fan* and *journalist* would probably act and think more in line with the expectations and ideas attached to the former category (e.g., cheering, singing, screaming at the referee) when attending a soccer match. However, the opposite is likely to be true for the same person when she is in the newsroom instead of in the bleachers. In this way, when the identity attached to a certain social group is salient, people influence and are influenced by others who share that identity, and thus adopt as their own the behavioral and cognitive features that define the group. Thus, the combination of social identity and situational context

determines the individual's perception of and interaction with the social world in which he or she exists (S.A. Haslam, Jetten, Postmes, & Haslam, 2009; Turner et al., 1987; Turner & Oakes, 1989).

Resting on the central ideas of SIT and SCT, the SIA thus provides a theoretical framework for understanding a broad range of social cognition and behavior. Through a shared sense of identity, we attain an idea of the self that is inherently social. That is, we define ourselves based on the social groups with which we identify, and act and experience the world according to the perceived meaning, values, and norms of these groups. Social identity thus anchors us in the social world and provides grounds for integration, interaction, and cooperation with similar others, and through this helps us understand and enact our self. Although explaining group-based behavior has been the traditional focus of social identity theorists, more recently researchers have linked the dynamics of group memberships and social identities to individual health and well-being (Jetten et al., 2012). The following section turns to these recent theoretical developments.

The well-being effects of social identity and multiple group membership

There is considerable support for the idea that there are several ways in which group membership benefits the individual. Past research has demonstrated a link between group membership, and related forms of social integration, and a variety of well-being factors, including lower likelihood of physical illness (Holt-Lunstad, Smith, & Layton, 2010) and mental illness (Cruwys, Haslam, Dingle, Haslam, & Jetten, 2014; McNeill, Kerr, & Mavor, 2014), increased life contentment and well-being after illness (J. M. Jones et al., 2011), decreased stress (S.A. Haslam, O'Brien, Jetten, Vormedal, & Penna, 2005), and greater job satisfaction (S. A. Haslam, Jetten, & Waghorn, 2009). A common thread throughout this research is the frequent finding that the support derived from

various types of social connectedness, including group membership, represents a central avenue through which well-being is facilitated (Cohen & Wills, 1985; S. A. Haslam et al., 2009; S.A. Haslam et al., 2005). This support may take the form of both material and emotional help and relief, affording the individual concrete assistance and psychological capital in the face of adversity (Jetten et al., 2012). That is, group-based social support does not only help the individual in times of need, but also contributes to psychological well-being by the simple virtue of its own existence (Jetten et al., 2012; Turner, 1981). These conclusions fit well with the aforementioned function of social identity as a shared platform on which group members can contribute and receive help when needed (S.A. Haslam et al., 2005; H. Tajfel & Turner, 1986). That is, by linking us with similar others – and thus allowing a self-definition as *we* rather than *I* – group membership appears to enable a sense of social structure and connectivity that facilitates cooperation, community, and mutual support, feeding positively into well-being.

Given the increasing variety of ways in which people can identify themselves by group memberships, it seems pertinent to ask whether the well-being effects associated with such memberships are cumulative in nature. That is, as we navigate the social environment and connect to fewer or more social categories along the way, do the associated group-based benefits vary accordingly? Is there a positive linear relationship between the *number* of groups with which the individual connects and his or her well-being? Certainly, it seems plausible that the more sources of support one has available – such as those accessible through group memberships – the better one is likely to function and feel. A number of studies have attempted to address this question. For example, Jetten, Haslam, Pugliese, Tonks, and Haslam (2010) conducted a study on the impact of identity-loss as a result of dementia on the well-being of a sample of older adults. Results indicated that as autobiographical memory (i.e., one's sense of self and identity) deteriorated so too did

feelings of well-being. Further analysis revealed that the loss through dementia of the social connections and sources of support accessible through multiple group memberships was central to these negative effects. Similarly, in research on stroke survivors, Haslam and colleagues (2008) found that well-being was positively associated with membership in multiple groups before stroke, as well as with the extent to which these memberships remained post-stroke. These findings have been further supported by other research demonstrating similar connections between multiple group memberships and well-being (Sani, Madhok, Norbury, Dugard, & Wakefield, 2014), self-esteem (Jetten et al., 2014), and alleviation of, and protection against, depression (Cruwys et al., 2013). Importantly, these benefits of multiple group memberships do not appear to be reducible to the number of individual ties that the given groups might afford. Recent research comparing the well-being effects of multiple interpersonal connections and multiple group memberships, consistently found that only the latter type of social connection significantly predicted well-being factors (Jetten, Branscombe, Haslam, Haslam, Cruwys, Jones, ..., & Zhang, 2015). In other words, these benefits are principally related to greater psychological capital afforded by multiple group membership (Jetten et al., 2012).

In addition to these studies that frame the benefits of multiple group membership in terms of social connection and support, other research outside the specific social identity literature has focused more on the *buffering* effect of belonging to multiple groups. For example, studies have demonstrated that having multiple identities at one's disposal can protect the individual from negative emotions associated with any one identity (Rydell & Boucher, 2010; Rydell, McConnell, & Beilock, 2009). Research in this domain has focused on *identity frame switching*, which is the process whereby the individual can shift his or her locus of identity between multiple groups (Benet-Martínez & Haritatos, 2005; Benet-Martínez, Leu, Lee, & Morris, 2002). These studies have

found that individuals can successfully switch to the most adaptive identity their present situation calls for (Daniel, 1992; Pittinsky, Shih, & Ambady, 1999; Sanchez, Shih, & Garcia, 2009). For example, Mussweiler and colleagues (2000) examined shifting social identities as a strategy for deflecting stress associated with identity threat. In the experimental setting of a maths exam, they found that participants moving away from their threatened identity (in this case, female gender framed as being poor at maths), cushioned anxiety and negative well-being effects and facilitated their performance on the maths test. Thus, by having a sense of self that is more complex and multifaceted, the individual may be able to switch between identities in ways that are functional and that protect the individual from the experience of stress in any one domain.

Taken together, these various studies suggest that the well-being effects associated with group membership might amass as the individual connects with more groups. The majority of this research, however, is correlational in nature, or makes use of specific configurations of identity in relation to specific tasks (e.g., women and maths in the identity switching literature), and therefore says little about the causal role of multiple group memberships *per se* in supporting individual well-being. Addressing this shortcoming, however, Jones and Jetten (2011) conducted research in which they examined the causal effects of multiple group memberships on indicators of physical resilience. In the first of two studies, they measured the time it took 12 air force pilots to recover to their baseline heart rate after a novel athletic task, and correlated this with the number of group memberships the participants previously reported. Results indicated that multiple group memberships were negatively associated with the time it took them to return to their baseline heart rate. In other words, the more groups to which participants belonged, the faster their physiological recovery from the physical challenge. In their next study, the researchers added an experimental component and manipulated the number of salient social identities (one versus three

versus five) in 56 university students before asking them to complete a *cold pressor* task (i.e. submerging their non-dominant hand in ice-water for as long as they could). The results showed that those participants with more identities activated were able to endure the ice water for longer than those who had only one identity activated. Similar to past research on the impact of social identification on well-being, this effect was theoretically attributed to the *buffering* qualities of multiple group membership. Particularly the latter study goes beyond correlational demonstrations of the significance of multiple group membership for individual psychological well-being, and shows the positive consequences that belonging to many (versus few) social groups can have for individual well-being. The authors argued that this buffer effect is likely due to the notion that belonging to multiple groups may provide the individual with a sense of belonging, agency and meaning in the broader social context, thus providing psychological resources to draw on in the face of challenge and stress (e.g. the cold pressor task). This conclusion makes sense in terms of past research connecting multiple group membership with resilience against group-based discrimination (Branscombe, Schmitt & Harvey, 1999) and the stress of various life-transitions (Iyer, et al., 2009). It also fits well with psychophysiological research connecting resilience against various types of stress with access to adequate psychological resources such as those offered by multiple group membership (Blascovich, Vanman, Mendes, & Dickerson, 2011). Thus, from this perspective at least, group membership is characterised as psychological capital that can facilitate adaptive function even in the absence of other group members. Thus, from this perspective at least, group membership is characterized as a psychological resource than can facilitate adaptive function even in the absence of other group members.

The outlined research thus strongly indicates a connection between group belonging and well-being, and further that this effect appears to accumulate in the context of multiple group

memberships. However, while this outcome is relatively consistent in the literature, there is still only a few published studies on this phenomenon, and even fewer that have explicitly investigated the processes that translate multiple group memberships into individual well-being. Theoretically, at least, there is more to group membership than mere belonging or salience. The content of group memberships (Hogg & Reid, 2006; Terry, Hogg, & White, 1999), and the meaning attributed to groups by the individual and broader society, are also prominent aspects of social identity theorizing (Jetten et al., 2012; Vignoles, Chrysoschoou, & Breakwell, 2000). For example, the experience of belonging to stigmatized (e.g., based on ethnicity or religion) or incompatible groups (e.g. *woman* and *engineer*, or *athlete* and *disabled*) must surely be different psychologically and emotionally than belonging to multiple high-status and compatible groups. In theory then, these features should also play some role as the individual combines his or her group memberships in the self-concept, and therefore structure the consequences of multiple group memberships.

In the next chapter, we discuss past research that may help us understand exactly how and when multiple group memberships combine to affect well-being. Specifically, we argue that there are at least three reasons why well-being may not accumulate simply as a function of the number of group memberships the individual may possess. First, the extent to which multiple groups are distinct and contribute to social identity complexity has been theorized to be relevant to their well-being potential (Roccas & Brewer, 2002). Second, belonging to a stigmatized group has been found to compromise a person's feelings of self-worth and well-being, indicating the significance of the specific socially derived meaning of group memberships, rather than their number alone (Barreto & Ellemers, 2003; Puhl & Brownell, 2006). And third, simultaneous membership in groups which are perceived to be incompatible with one another has been found to have negative consequences for the individual by creating an internal sense of conflict and identity fragmentation (Brook et al.,

2008; Miramontez, Benet-Martínez, & Nguyen, 2008). Each of these factors – group distinctiveness, social value, and compatibility – should determine whether multiple groups combine in ways that are positive, neutral or negative.

Chapter 2

Complexity and complication in the relationship between multiple group membership and well-being.

As outlined in the previous chapter, an emerging evidence base indicates that well-being benefits amass from individual membership in multiple groups. However, few studies in this literature have considered the specific value or meaning attributed to groups in society and how these features might determine their well-being effects. Nonetheless, these characteristics are conceivably central to how the individual experiences group membership, and how he or she negotiates and combines *multiple* group memberships. Thus, in this second chapter we focus on the factors that previous research suggests may be germane in accounting for the benefits, as well as costs, of belonging to multiple groups. In particular, we explore the significance of social identity complexity, identity stigma, and identity compatibility to develop hypotheses about the consequences of multiple group memberships that acknowledge the importance of these specific features of groups, both alone and in combination. Before presenting an integrated treatment of these ideas, we next review each of the relevant literatures we draw from separately.

Social identity overlap complexity as a moderating factor

Social identity complexity (SIC) takes root in the idea that social categories often intersect, and that more than one category can define an individual at any point in time (Miller, Brewer, & Arbuckle, 2009; Roccas & Brewer, 2002). More specifically, SIC relates to the individual's perception

of the extent to which two or more social categories share members – that is, whether memberships in different groups are overlapping versus distinctive (M. B. Brewer, 2008; Roccas & Brewer, 2002; Schmid & Hewstone, 2011). Given the subjective nature of this assessment, category overlap can depart significantly from reality (Schmid & Hewstone, 2011). That is, while it might in fact be the case that many doctors are women, these two groups (*women* and *doctors*) might nonetheless be perceived as relatively distinct.

From the perspective of this theory, different combinations of group membership and overlap give rise to different profiles in terms of social identity complexity. Viewing the multiple groups to which one belongs as highly overlapping may lead to the formation of a decidedly exclusive overall ingroup (for example, *all Barcelonans are FC Barcelona fans*), indicative of low SIC (M. B. Brewer & Pierce, 2005; Schmid & Hewstone, 2011). Alternately, others may perceive very little overlap and recognize that ingroup members on one dimension are not necessarily ingroup members on another dimension (*some Barcelonans may be Real Madrid fans or Manchester United fans*). This type of representation would signify high SIC (see Figure 2.1) (Roccas & Brewer, 2002).

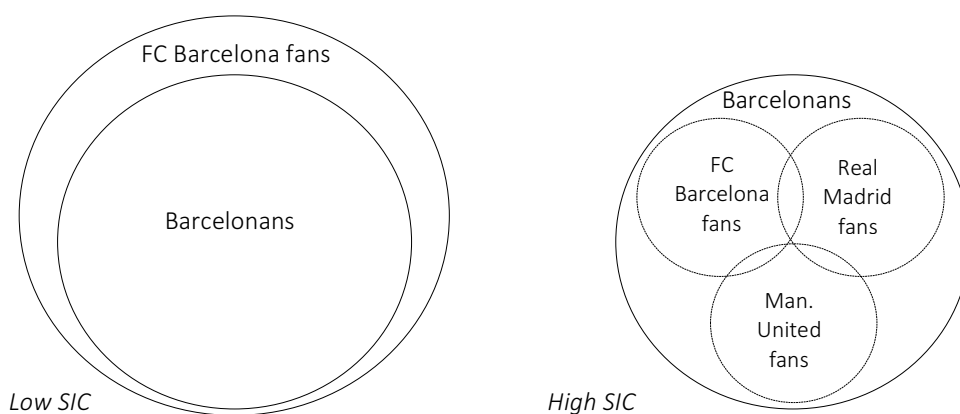


Figure 2.1 Graphic representation of social category membership overlap, indicative of low vs high SIC.

Roccas and Brewer (2002) propose four general modes of subjective identity integration, each indicating a different level of SIC. At the most simplistic end of the spectrum, *intersection* indicates an overall identity defined at the exclusive intersection of multiple ingroups – for example, seeing oneself as a *female, Black, Christian*. Anyone who does not fulfil all three of these criteria is viewed as an outgroup member. This level of SIC thus describes a highly specific and rigid ingroup structure. Next on the spectrum, *dominance* refers to a single, overarching exclusive social identity defining the self-concept. For example, the dominant ingroup could be *Christian*, and would thus include all Christians and exclude all non-Christians. Other group memberships within the dominant Christian group (e.g. such as Christian women or Black Christians) would be viewed as intragroup variation. Thus, while dominance is similar to intersection in terms of representing a stark and inflexible identity concept, defined primarily by a single identity above all others, this level of SIC nonetheless acknowledges variation within the primary group. *Compartmentalization* indicates a more complex view where group memberships are kept separate and distinct by situational context. That is, the individual possesses many different social identities each of which becomes exclusively salient depending on the current circumstances. For example, the identity *Christian* would likely be activated at church and in this context be the identity that defines the individual to the exclusion of all others. However, in a different situation where racial or gender identity may instead be at the forefront of that person’s mind, the dominant ingroup changes accordingly. Finally, *merger* refers to an inclusive superordinate ingroup identity, extended to anyone who at any given time matches any of one’s own multiple social identities. Here, situational context is less important. For example, one might identify as *female, Black, and Christian* and consider anyone who belongs to any of these groups as an ingroup member. Social identity in this format is the sum of one’s combined group

identifications, and is thus seen as the most comprehensive and complex form of identity integration (Roccas & Brewer, 2002).

Research has established that SIC has positive intergroup consequences – for example by being correlated positively with outgroup tolerance and negatively with intergroup bias and prejudice (M. B. Brewer, 2008, 2010; M. B. Brewer, Gonsalkorale, & van Dommelen, 2013; M. B. Brewer & Pierce, 2005; Marilyn B. Brewer, Wagner, Tropp, Finchilescu, & Tredoux, 2008; Knifsend & Juvonen, 2013, 2014; Roccas & Brewer, 2002; Schmid & Hewstone, 2011; Schmid, Hewstone, & Al Ramiah, 2012; Schmid, Hewstone, & Tausch, 2014; Schmid, Hewstone, Tausch, Cairns, & Hughes, 2009). Explaining these effects, most of the research suggests that maintaining a multifaceted and low-overlapping representation of the multiple groups to which one belongs, enables recognition of the fact that while someone may be an outgroup member in one respect, they may also be an ingroup member in another. Thus SIC enables an awareness of the malleability of group memberships and intergroup distinctions and through this facilitates inclusiveness and community over exclusiveness and intolerance (M. B. Brewer, 2008, 2010; M. B. Brewer et al., 2013; Knifsend & Juvonen, 2014; Schmid et al., 2014).

Although some have theorized that SIC might also have benefits for the individual, and not just for social relationships (Roccas & Brewer, 2002), to date there is little research on this possibility. Nevertheless, it seems plausible that SIC may be relevant to understanding the demonstrated benefits of multiple group membership. For example, if the self-concept is based on social identities that are perceived as highly overlapping and thus consisting of more or less the same people (intersection or dominance), the extent of social support and other benefits that could be derived from multiple group membership are not likely to be cumulative. That is, if one belongs

to multiple overlapping groups, one does not have access to the multiple distinct sources of identity, or multiple distinct sources of support and connection, that might additively combine to improve overall well-being (Jetten et al., 2015; Jetten et al., 2012; Turner, 1981; Zimet, Dahlem, Zimet & Farley, 1988). Instead, this individual would have a relatively limited basis from which to conceptualize the self and on which to rely for group-based support and solidarity. By comparison, individuals whose sense of self comprises many distinct, non-overlapping groups, with each representing a separate point of access to the social and psychological advantages of group membership, has a broader and more varied foundation from which to derive well-being (Jetten et al., 2015). In other words, the rewards of multiple group memberships may only accrue in a linear fashion if the component groups are perceived as discrete and thus providing diverse, non-redundant, sources of social identity (compartmentalization or merger) (Jetten et al., 2012; Roccas & Brewer, 2002; Turner, 1981).

This line of reasoning is particularly relevant with respect to the demonstrated buffering effects of multiple group memberships against life's stressors and challenges (Jones & Jetten, 2011; Mussweiler et al., 2000). Dealing with negativity associated with a particular group membership - such as for example identity threat - may be simpler when this threat can be isolated from the other groups that are available to the individual. This isolation is presumably easier when the groups that define one's self are distinct and separate (Roccas & Brewer, 2002; Rydell & Boucher, 2010). For example, if a man is fired from his job, any feelings of low self-worth or anxiety may be mitigated if he has a clear idea of the boundaries of his professional identity, allowing him to effectively shift his locus of identity to another and separate well-defined role (e.g., father). On the other hand, if his idea of fatherhood entails being able to secure employment - thus perceiving his professional and paternal identities as highly overlapping and enmeshed - any negative effects

associated with one of them may likely seep into the other, affecting the self-concept more generally (Roccas & Brewer, 2002). Similarly, SIC might also buffer against other more general stressors and challenges in life. It may, for example, be easier to deal with the stress associated with a high-pressure job if the individual can draw on other, non-overlapping identities for respite and identification (e.g. hobby). By contrast if these identities are overlapping, the stress associated with the individual's occupation may spill over into his or her other identities and thus impact negatively on overall well-being (Schulz, Cowan, Cowan & Brennan, 2004; Ferguson, 2011; Grzywacz & Marks, 2000; Neff & Karney, 2004). In this way, multiple distinct identities may shield an individual from the deleterious effects of life's stressors and challenges. By contrast, a highly overlapping self-concept may leave a person particularly vulnerable to adversity and hardship.

Another way in which SIC may translate into increased well-being is by facilitating effective self-expression. Specifically, research has demonstrated increased well-being through *self-verification*, which relates to individuals' desire to be viewed by others as they view themselves (W. B. Swann, Pelham, & Krull, 1989; W.B. Swann, Wenzlaff, Krull, & Pelham, 1992). Past studies on the topic have found that people will go to great lengths to communicate their identity to those around them, and that by doing this effectively increases feelings of self-verification and in turn, self-esteem and well-being. In other words, the better individuals are at expressing their identities to others, the more likely those around them will validate and verify their claim to those identities, and the better off they will be, both mentally and physically (Burke & Stets, 1999; Chen, Chen, & Shaw, 2004; Giesler, Josephs, & Swann Jr, 1996; Giesler & Swann Jr, 1999; Joiner, 1995; Ritts & Stein, 1995; W. B. Swann, Polzer, Seyle, & Ko, 2004; Thatcher & Zhu, 2006). Linking this with the ideas of SIC, it seems intuitive that accurate self-expression be easier if the groups that comprise an individual's sense of self are distinct. That is, if an individual perceives his or her multiple social

identities as discrete and separate (high SIC), then this should translate into a clearer idea of exactly what these identities represent (both individually and in combination), ultimately facilitating their accurate and effective expression. By contrast, if his or her social identities are highly overlapping and indistinct (low SIC), communicating their precise content and meaning effectively to others is likely to prove a relatively difficult task.

In sum, rather than simply looking to the number of group memberships (and corresponding identities) that make up an individual's self-concept, the SIC perspective highlights how the subjective configuration of multiple social identities can be important for understanding individual attitudes and behavior. While the question of exactly how and why SIC should enable the well-being effects of multiple group membership is empirically underdeveloped within this framework, we contend that the central components of SIC research provide a good grounds for investigating the link between identity overlap complexity and social support, self-expression, and the extent to which multiple identities buffer against adversity. Having said that, this approach is also limited. That is, it focuses only on the perceived distinctiveness (or non-overlap) of multiple group memberships, ignoring the forces that might explain when and why certain groups are perceived to be non-overlapping. These forces, however, might be relevant to comprehensively understand the well-being consequences of group membership. For example, the socially defined value (or devalue) of groups might determine how these are perceived as distinct, and might also determine whether these are positive or negative sources of individual well-being. Thus, the SIC perspective represents a rather descriptive take on the characteristics of multiple group membership, refraining from consideration of their socially defined content. The following sections take a closer look at these additional aspects of group membership and the further implications these might have when groups are combined within the individual self-concept.

Social identity content: The impact of stigma

Not all identities are equal. Rather, identities, and the group memberships on which these are based, can be differentiated in terms of their value – both to the individual and in society. These value attributes are also likely to frame the consequences of identities for individual well-being. In particular, membership in a stigmatized group is likely to have repercussions for the individual's sense of self-worth, their identification with that group and thereby its potential to be a source of support and well-being. It may also complicate the individual's inclusion in other groups that connect to their self-concept and which could provide them with alternative sources of support (Goffman, 1986; Puhl & Brownell, 2006). In this way, maintaining multiple group memberships may become especially difficult when one or more of those groups carries negative social value.

Consistent with these ideas, membership in stigmatized groups has been found to have significant adverse impacts on psychological well-being in terms of depression (R. S. Lee, Kochman, & Sikkema, 2002; Lewis, Derlega, Griffin, & Krowinski, 2003), life satisfaction (Markowitz, 1998), anxiety and hopelessness (R. S. Lee et al., 2002), and psychological distress (Kang, Rapkin, & DeAlmeida, 2006). Indeed, the majority of research on the topic has demonstrated negative effects of stigma on psychological and physical health (Beals, Peplau, & Gable, 2009; Carr & Friedman, 2005; Ellemers & Barreto, 2006; Link, Struening, Neese-Todd, Asmussen, & Phelan, 2014; Puhl & Heuer, 2009). For instance, in a recent meta-analysis, Schmitt, Branscombe, Postmes, and Garcia (2014) reviewed 328 correlational studies and 54 experimental studies on the psychological well-being effects of stigma and group-based discrimination. Their overall conclusions were that group-based discrimination affected individual well-being consistently and negatively. This general effect differed in size, however, depending on the nature of the target of discrimination, with members of disadvantaged (i.e., stigmatized) groups experiencing stronger negative effects as a result of

discrimination than members of higher status groups. This finding sits well with past research, showing that prejudice is most harmful when it reflects a prevalent and ingrained societal opinion (Schmitt & Branscombe, 2002).

Research on multiple groups and well-being has mostly developed outside of the stigma literature, yet it seems plausible that the social value of identities might change the relationship between multiple group membership and well-being in important ways. As noted above, past research has demonstrated the potential value of multiple group memberships in protecting the self against negative effects (e.g. stress, identity threat) associated with any one group (Gresky, L., G., & B., 2005; Rydell et al., 2009). This could suggest that multiple group memberships would be especially psychologically beneficial in the context of stigma. However, we believe that this relationship may not be so straightforward. In fact, it has been suggested that belonging to a stigmatized group can preclude the individual from accessing the benefits associated with multiple group memberships by eclipsing these, rather than being buffered by them (Goffman, 1969, 1986). That is, the stereotypic qualities associated with a stigmatized group membership may overshadow the individual's attachment to other groups, leaving the stigmatized identity as the central basis for the person's self-definition and interactions with others (Goffman, 1986). In this way, a devalued identity complicates the process of connecting to other social categories and maintaining meaningful relationships with the non-stigmatized (Devine, Plant, & Harrison, 1999; Ellemers & Barreto, 2006; Goffman, 1969, 1986; Goldstein, 2002). For example, being Black in a majority White society might prevent the individual from communicating the self effectively and from being perceived by others accurately in terms of their other identities. A Black person may be a doctor, a father, and a football fan, but his skin color may 'blind' others to his additional identities, effectively undermining expression of these and inhibiting inclusion in the associated social groups. Moreover,

being a minority group member may practically restrict the likelihood of membership in many other socially valued categories, potentially making it difficult to enter certain occupations, community groups, or educational settings that would broaden one's social base (Barreto & Ellemers, 2003; Beals et al., 2009; Chaudoir & Quinn, 2010). Thus, the psychological and material constraints that stigma places on the individual may ultimately complicate both inclusion in multiple groups and access to the psychological resources associated with these groups.

Just as all identities are not equal, however, nor are all stigmatized identities equal in terms of the constraints they impose on the individual. A variety of additional identity features are relevant to understanding the strategies open to the individual in navigating stigma, and the barriers that are likely to interfere with their social integration, both within and beyond their stigmatized group membership. For example, the previously mentioned 'blinding' effect of stigma is presumably dependent, at least in part, on the visibility of the stigmatized identity (Chaudoir & Fisher, 2010; Frable, Platt, & Hoey, 1998; D. M. Quinn & Earnshaw, 2013). For instance, continuing the previous example, the man's race most likely constitutes an obvious identity, virtually impossible for him to hide from others. By contrast, if his stigma were attached to, for instance, his sexual orientation, this would be concealable, and he would likely be able to choose when, and to whom, to express this identity. In other words, given the low social visibility of sexual orientation in everyday life, others may not define this person by his sexuality to the same extent that they would by his highly visible race. In this sense then, it may particularly be those stigmatized identities that are conspicuous that limit the ways in which the individual can express their full self, thereby disrupting their access to the benefits of multiple group memberships. Along these lines, stigma visibility may be an important moderator of the degree to which multiple group memberships buffer and protect the self in the context of devalued identities.

It should be noted, however, that while a *visible* stigma in particular can hurt the individual (e.g., by being an obvious target for prejudice), concealable stigmas can still have negative repercussions for the self-concept, albeit by different channels (Ellemers & Barreto, 2006; Goffman, 1986; D.M. Quinn & Chaudoir, 2009). That is, while an individual with an invisible stigma may not be targeted for discrimination as easily as someone with a more obvious one, the dominance of a stigmatized identity in the overall self-concept may still place a significant psychological burden on the individual, such that they are constantly aware of, and continually have to manage, their devalued status (Goffman, 1986; R. S. Lee et al., 2002; Lewis et al., 2003; D. M. Quinn, 2006). As people try to hide their stigmatized characteristics, feelings of not belonging, inauthenticity, and fear of being revealed, may prevent the individual from reaching out to others for social support and inclusion (Newheiser & Barreto, 2014; D. M. Quinn & Earnshaw, 2013; Schmitt & Branscombe, 2002).

In sum, the available evidence indicates that belonging to devalued groups may block the benefits otherwise associated with multiple group membership. If a person is obviously a member of a stigmatized group (race, physical disability), social ostracism may ensue, effectively disconnecting him or her from their other group memberships and accompanying benefits. If, however, the stigma is more concealable (mental illness, history of homelessness) and thus allows the individual to circumvent social isolation and prejudice, he or she would presumably still have to deal with the psychological burden of concealing the devalued identity and balancing this part of the self with his or her other important group memberships. The next section, focuses more explicitly on this latter point, by discussing the complication that may arise from resolving an identity that in some way conflicts (e.g., due to stigma) with the rest of the self-concept.

Identity conflict and compatibility

Due to differing social expectations around the value and meaning of membership in specific social categories, the process of reconciling multiple disparate identities into a complex, but integrated, self-concept is unlikely to be straightforward. Multiple group memberships may be perceived as more or less compatible in terms of their identity-related content, and this may make it more or less difficult for these to become part of a coherent self-image. For instance, *woman* and *mid-wife* would be perceived by most as highly compatible identities because this profession is mostly occupied by women and is traditionally considered a female vocation (Dimond, 2002). By the same logic, being a surgeon and an ex-convict would likely be considered incompatible, just as being an athlete and disabled might. Given the many potential sources of identity conflict, it seems plausible that the more groups to which a person belongs, the greater the chance that the individual might experience some form of identity incompatibility.

Research indicates that people who are unable to reconcile incompatible identities are more likely to have a fragmented sense of self (Donahue, Robins, Roberts, & John, 1993), to experience compromised social functioning (Benet-Martínez et al., 2002), weaker social connections and reduced belonging (Iyer et al., 2009; London, Rosenthal, Levy, & Lobel, 2011; Rosenthal, Levy, London, Lobel, & Bazile, 2013; Rosenthal, London, Levy, & Lobel, 2011) and, perhaps because of these things, display diminished overall well-being (Benet-Martínez, 2006; Benet-Martínez & Haritatos, 2005; Benet-Martínez et al., 2002; Downie, Koestner, ElGeledi, & Cree, 2004; Miramontez, Polovina, Isas, & Benet-Martínez, 2006). Combining these ideas with the multiple group membership literature, Brook and colleagues (2008), conducted a study designed to ascertain the extent to which identity compatibility and importance influenced the relationship between multiple group membership and well-being. Their findings were based on a sample of 372

undergraduate university students, and indicated that while the number of group memberships the individual reported was positively correlated with their well-being, this was only the case when the associated identities were perceived to be important and compatible with one another. When identities were instead considered incompatible, this association reversed. Thus, it would appear that the perceived *fit* of the individual's multiple identities is a critical factor in determining whether they contribute to, or detract from, individual well-being.

Several reasons have been offered for how and why identity incompatibility may interfere with psychological and general well-being. In a study on multiple group membership, identity meaning, and health, Simon (1995) developed the *role-meaning hypothesis*, which predicts greater psychological benefits of multiple group memberships if the behavioral expectations and demands of those memberships are similar. On the other hand, if belonging to particular groups is perceived to require different or opposing behavior, then this fragments the self, causing stress and anxiety and ultimately lower well-being. This explanation fits well with the conclusion of the aforementioned study by Brook and colleagues (2008) who found that the negative impact of identity incompatibility on well-being was mediated by emotions related to self-perceived discrepancies of identity expectations. Specifically, participants experienced feelings of guilt, self-contempt, and uneasiness as a result of diverging identity expectations and norms.

Another way in which identity incompatibility may block the benefits associated with multiple group memberships is by complicating social relationships and restricting access to social support. A qualitative study of British Muslim gay men by Jaspal and Cinnirella (2010) found that in the context of their religion, participants attached negative value and meaning to their sexual identity as this was perceived by themselves and by their peers to directly contradict the expectations of their

faith. Accordingly, and in order to maintain membership in their religious community, they concealed their sexual identity, effectively restricting their expression of a significant aspect of their self and limiting their access to, and social support from, the gay community. Similar to the ideas of the role-meaning hypothesis, at an emotional level, the feelings of identity incompatibility within this group were also associated with shame and reduced self-esteem. In this way, one self-defining identity (sexuality) was effectively stigmatized in the context of another self-defining identity (religion), giving rise to a sense of incompatibility and becoming a source of internal conflict as well as placing limits on one's external social relationships.

In sum, synthesizing these ideas with those from the preceding two sections, it would seem that multiple identities can be a source of conflict as much as one of strength. If the content and expectations associated with one group membership are perceived (by the self or by others) to preclude or significantly depart from those of another group membership, then combining these in the overall self-concept may become difficult. This, in turn, may make it harder for the individual to integrate and express their identities to others, and to reach out and connect with sources of social support. These limits on expression and connection are likely to compromise well-being. In addition, it seems likely that integrating disparate identities, expressing these effectively to others, and forming supportive connections based on these might all be harder when one or more of the identities involved is socially devalued or otherwise stigmatized. The presence of stigma might lead people to suppress aspects of their self and hide these from others, but this can result in inauthentic relationships. Reciprocally, and regardless of how one wants to be seen, others might perceive the self solely through the lens of the stigmatized identity, perhaps resulting in concerns that one is not really understood and that one's self-verification needs are not met. For all these reasons, it is important to understand that the way that identities are subjectively perceived and

expressed (e.g., as compatible or not) and socially treated (e.g., as stigmatized or not) may have significant consequences for the relationship between multiple group membership and well-being.

Conclusion and present research

As fundamentally social beings, we define ourselves based on the groups to which we belong, and our values, attitudes, and behavior are guided by the socially constructed meaning and definitions of these groups. This in turn allows us to think of ourselves and act as part of a greater collective. In general, this is a good thing as group membership provides a common basis on which we can connect with similar others and, from the resulting social network, draw support and strength. In line with this, multiple group memberships have been found to impact positively on individual health and well-being. The research on this relationship, however, has generally failed to incorporate a balanced consideration of the numerous identity features that may affect the way that multiple groups interact and combine into a meaningful, cohesive and supportive self-concept. Thus, we focus on those features of individual group memberships that have been found to affect personal well-being, and theorize that these may facilitate the observed well-being effects of *multiple* group memberships.

In the preceding chapters, we have identified three mechanisms that may underpin the relationship between multiple group membership and individual well-being. First, we argue that the extent to which the individual maintains a complex self-concept, and perceives his or her multiple group memberships as distinct and non-overlapping, may moderate the access to the rewards that group memberships may offer. Specifically, the added benefits of multiple group memberships should accrue when these groups represent distinct sources of identity and social support. Second,

we believe that the meaning attributed by society to individual groups and the associated identities, may either block or facilitate their well-being effects. Specifically, the presence of stigmatized identities in the individual self-concept is likely to inhibit the positive outcomes of multiple group memberships. This effect, however, may take shape in different ways dependent on the visibility of the stigmatized identity. Specifically, when one is visibly stigmatized, this is likely to become a significant burden on one's social relationships and well-being, whereas when one's stigmatized characteristics are invisible, multiple identities might enable negotiation of the self and social relationships in ways that are more functional. Third, we contend that as the individual combines his or her multiple group memberships in the overall self-concept, the social content and expectations (e.g., stigma) surrounding what it means to belong to those groups may result in the perception of identity incompatibility. When salient, self-defining identities clash in this manner, it might create problems not only for self-integration (i.e., forming a coherent self-concept), but also for engaging effectively with the social environment. That is, others might exacerbate feelings of identity conflict when they do not recognize or value particular parts of the individual and thus refrain from being positive sources of social support. In other words, these consequences of incompatible identities are likely to constrain the individual's access to what might otherwise be the benefits of multiple group memberships.

To test these ideas, we present five studies over the next three chapters. The first three studies explore the relationship between multiple group membership and well-being, examining the potential influence of SIC, identity stigma, and compatibility. This is done with two online survey studies (Chapter 3) specifically assessing whether and how these variables influence the well-being effects of multiple group membership. In a third online study (Chapter 4), we manipulate the number of group memberships and their compatibility to establish a causal connection between

these variables. Next, Chapter 5 reports two experiments that take a slightly different approach. Acknowledging the aforementioned buffering effects of multiple identities in times of adversity, Studies 4 and 5 manipulate the number and compatibility of group memberships and measure their effects on resilience against stress. Further, rather than using self-report instruments as the main outcome variables, these experiments measure physiological responses to stress as a more objective index of resilience. The practical and theoretical implications of this research as well as potential future directions are discussed in the concluding Chapter 6.

Chapter 3

Is there always strength in numbers? Exploring the consequences of social identity complexity and stigma in the context of multiple group memberships

While the research outlined in the previous two chapters clearly demonstrates a connection between multiple group memberships and a range of well-being outcomes, we argue that this relationship is complex and likely to be contingent on a variety of additional factors above and beyond the sheer number of groups the individual belongs to. We contend that various identity features and dynamics – including social identity complexity (SIC), identity stigma and compatibility – shape the degree to which possessing multiple group memberships supports (versus undermines) individual action and interaction in the social world, and the degree to which this allows for multiple group memberships to contribute to (versus interfere with) the cohesiveness of the individual's self-concept. In line with the research outlined in Chapter 1 and 2, we further believe that these effects are mediated by the extent to which the individual can access social support and feels free to express his or her multiple identities to the world.

Thus, to explore the relationship between multiple group membership and well-being in these terms, we conducted two correlational survey studies. The first study looked specifically at the impact of SIC on the relationship between multiple identities and well-being, while the second study examined the effects of identity compatibility and stigma. In both studies, we explored identity expression and access to social support as mediators between multiple group memberships

and well-being outcomes. In the second study, we added the additional mediator variable of social inclusion. We report both studies below.

Study 1

In Study 1, we considered the number of groups to which the individual belonged, while also taking into account the perceived overlap versus distinctiveness of the most important of these groups. Consistent with models of social identity complexity (Roccas & Brewer, 2002), we first hypothesized that multiple group memberships would be positively associated with individual well-being when the key component identities were seen to be relatively distinct (high SIC) as opposed to overlapping (low SIC). Further, we believed that multiple identities would contribute most to well-being if these identities were valued as opposed to stigmatized.

We were also interested in the mechanisms through which these effects might occur. Specifically, because other research on the benefits of group memberships has highlighted their role in providing individuals with access to actual, or expected, social support (C. Haslam et al., 2008), we included a measure of this as a mediator between social identity complexity and individual well-being. Further, we reasoned that membership in multiple distinctive groups might, in fact, lay the foundations for a clearer sense of self and thereby more practice expressing this self to others within one's social environment. Thus, given connection between self-verification processes and individual well-being (discussed in Chapter 2), we also measured identity expression as a potential mediator. Thus, we hypothesized that being able to effectively articulate the self – both socially and within one's own mind – and to access the support provided by others by virtue of their shared group membership, should all, in turn, contribute to enhanced individual well-being and thus mediate effects of multiple group memberships on the self.

Method

Participants

The research was conducted via an online survey advertised with flyers at various public locations (e.g., public transport, libraries, universities), on social networking sites (LinkedIn, facebook), as well as by email to personal and professional contacts. In response to this advertising, a sample of 131 adults was recruited. Of these, 19 cases had missing data and were therefore excluded from the analyses. The final sample of 112 participants included 23 males and 89 females. The majority of these (31.9%, $n = 36$) were aged between 18 and 25 years, with a total of 68.2% ($n = 77$) of the sample being within the age range of 18-35. A total of 19 different nationalities was included in the sample, with the majority, 75.3% ($n = 85$), being from Western countries such as Australia (31.9%, $n = 36$), the UK (30.1%, $n = 34$), or the US (13.3%, $n = 15$). The most common occupation was *university student* (58.6%, $n = 65$) followed by *academic* (15.3%, $n = 17$). The sample included 13 different ethnicities, but the vast majority of participants identified themselves as White (75.9%, $n = 85$).

Survey and measures

The survey first asked participants to list as many of their group memberships that they could think of ('In the text box below, list as many groups that you can think of that are relevant to your daily life'). From the resulting list, they were then prompted to choose the four groups that they felt were the most important and that best defined them. We limited participants to four groups primarily for practical reasons to do with survey length, but also because four groups allowed for multiple (specifically six) comparisons between individual group memberships. Next, participants responded to a series of items focusing on various aspects of social identity (complexity, expression,

importance) in relation to each of the four groups they had chosen (detailed below). Participants then completed more general measures of psychological well-being.

Identity measures. Social identity complexity (SIC) was operationalized based on the method introduced by Roccas and Brewer (2002). Specifically, SIC was defined in terms of both the number of group memberships and the perceived extent of overlap between their most important (i.e., top four) groups. A larger number of non-overlapping identities indicated higher identity complexity, whereas fewer and more overlapping identities indicated lower complexity. Thus, after listing any number of identities which defined them, each participant was asked to rate the degree of overlap between each possible pairing of his or her four most important identities (i.e., 'of people who belong to, e.g., the group American, how many also belong to the group Christian?') on a 10-point Likert scale (1 = very few, 10 = nearly all). The average overlap score for all six identity pairings was then calculated to obtain an overall measure of identity overlap complexity.

In addition to ratings of perceived overlap between the chosen identities, we measured a number of features of each of these identities (all measured on 5-point Likert scales with 1 = strongly disagree, 5 = strongly agree). First, *identity importance* was gauged with two items created for the study ('The group [X] is an important reflection of who I am', 'In general, belonging to [Group X] is an important part of my self-image'; $\alpha = .84$). These ratings were then averaged across identities to create a composite identity importance score. Next, *Identity value* was rated both in terms of value to the self ('To what extent do you consider your membership with [Group X] as generally positive or negative?') and perceived value in the eyes of others ('To what extent do you think your membership with [Group X] is considered positively or negatively by others in the community/society in which you live?'). These single-item measures were included to give an

indication of the nature of the identities selected by participants. Similar to identity importance, these ratings were averaged across identities to create composite identity value scores.

After rating each of their chosen four identities on these dimensions, a number of more general questions about the self and identity were asked that did not refer to the specific groups. These items were again measured on 5-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree). First, three items were developed for this study to measure *identity expression*. These items focused on the person's perceived freedom to express their own identities, and the degree to which they felt that others perceived them for who they were as a result of this expression ('In general, I feel free to fully express myself and my identity to the people around me', 'Other people don't see me the way I want to be seen' (reversed), and 'Sometimes I feel like other people are trying to put me in a box that doesn't fit' (reversed; scale reliability $\alpha = .69$). Next, we used a three-item measure of perceived access to *social support*, measured on 5-point Likert scales (scale reliability $\alpha = .82$), 'To what extent do you feel that you have family or friends so close to you that you can count on them if you have serious problems?', 'How much concern/interest do people show in what you are doing?', 'How difficult would it be for you to get practical help from neighbors if you should need it?'

Well-being measures. Psychological wellbeing was assessed through the 11-item General Well-being index (GWBI) (Hopton, Hunt, Shiels, & Smith, 1995) which measures a person's well-being in general in life (scale reliability $\alpha = .89$) using 5 multiple choice answer options (e.g. Q: 'In general, do you feel disheartened or sad?' A: 'All of the time', 'Most of the time', 'From time to time', 'Very occasionally', 'Not at all'). The answer options were turned into a scale where higher numbers indicated higher well-being.

Results

Analytic strategy

Data analysis was conducted in two steps. First, descriptive statistics (means, SDs, correlations) were generated for each of the variables to provide a general overview of participant responses and variable relationships. Next, guided by the preliminary results as well as by the study hypotheses, moderated regression analyses were conducted to determine in greater detail any statistically significant associations between the identity and well-being variables. Of primary interest were the hypothesized relationships between the reported number of identities, perceived identity overlap, and well-being.

Descriptive findings

On average, respondents listed a total of approximately seven ($M = 7.05$, $SD = 3.18$) groups that they believed defined them in some way. These identities related to range of different group memberships. Some were based on large categories such as nationality, gender, ethnicity, religious conviction, while others described smaller groups, such as eating habits and intolerances (e.g. vegetarian, celiac), dog ownership, rowing crew, book club, etc. The perceived overlap between participants' most important group memberships was generally low ($M = 3.93$, $SD = 1.95$ on a 10-point scale), indicating relatively high SIC. The identity and well-being variables yielded average scores significantly higher than the scale midpoint of 3.00 (see Table 3.1). Thus, participants were generally thinking about important, positively valued group memberships.

Table 3.1 Mean statistics for identity and well-being variables

Variable	Mean	Std. dev.	Minimum	Maximum
Identity quantity	7.05	3.18	4.00	21.00
Identity overlap	3.93 ^{†*}	1.95	1.00	8.33
Identity importance	3.96*	0.66	1.25	5.00
Identity value (self)	4.26*	0.61	2.25	5.00
Identity value (others)	3.90*	0.69	2.25	5.00
Identity expression	3.37*	0.96	1.00	5.00
Social support	3.96*	0.85	1.50	5.00
Well-being	3.69*	0.85	1.29	5.00

[†] Identity overlap was measured on a 10-point Likert scale; all other measures were taken on 5-point scales. * Mean departs from scale midpoint (identity overlap=5.5; all others=3) significantly at $p<.001$

Next, correlations for the main identity and well-being variables were calculated to provide a preliminary assessment of any statistically significant relationships (see Table 3.2). Significant correlations were evident between *identity overlap* and *identity value (others)*. Thus, the participants with more complex identities (i.e., low overlap) reported groups that were perceived to be more valued by others. There were no significant correlations between *identity overlap* and any of the well-being measures, nor were there any significant correlations between *identity quantity* and any other variable (see Table 3.2).

Table 3.2 Correlations between identity and well-being measures

Variable	1	2	3	4	5	6	7	8
1. Identity quantity	-	.15	.12	-.15	-.05	.02	.17	.15
2. Identity overlap		-	.13	-.12	-.21*	.13	.10	.05
3. Identity importance			-	.22*	.07	.09	-.07	.15
4. Identity value (self)				-	.57**	.00	.25**	.29**
5. Identity value (others)					-	.12	.29**	.23*
6. Identity expression						-	.43**	.37**
7. Social support							-	.39**
8. Well-being								-

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

Regression analyses

Regression analyses were conducted to further ascertain the nature of the relationship between the variables, and to test the specific hypothesis that identity complexity (the combination of multiple, distinctive groups) has consequences for individual well-being. To test this idea, well-being was used as the main dependent variable (DV) and the independent variables (IV) were identity overlap and identity quantity, and their interaction. Prior to the analysis, identity overlap and identity quantity were mean centered and an overlap X quantity interaction variable was computed by multiplying the centered scores. Regression analyses were conducted in which the main effect terms were entered at the first step followed by the interaction term at Step 2.

A regression analysis assessing the impact of identity overlap and identity quantity on well-being revealed no significant main effects ($B = .02$, $SE = .04$, $t(107) = .57$, $p = .57$; $B = .04$, $SE = .03$, $t(107) = 1.15$, $p = .25$, respectively). Inclusion of the interaction term, however, increased the overall variance explained, R^2 change = .05, $F(1, 107) = 5.42$, $p = .02$, and the interaction itself was significant at this step, $B = -.03$, $SE = .01$, $t(107) = -2.33$, $p = .02$. In order to decompose the interaction, the effect of identity quantity was examined at high (+1 SD) and low (-1 SD) identity overlap (see Figure 3.1). This revealed a significant main effect for identity quantity at low identity overlap, $B = .09$, $SE = .04$, $t(107) = 2.31$, $p = .02$, while no such effect was evident at high identity overlap, $B = -.03$, $SE = .04$, $t(107) = -.71$, $p = .48$. Thus, it would appear that multiple group memberships are associated with enhanced well-being in participants only at low levels of identity overlap (i.e., high complexity).

This analysis was repeated on the measures of identity expression and perceived social support. This revealed a significant main effect of identity overlap on identity expression, $B = .09$, SE

= .04, $t(107) = 1.95$, $p = .05$, and a significant overlap X quantity interaction as well, $B = -.07$, $SE = .01$, $t(107) = -4.80$, $p < .01$. The main effect of identity quantity was significant at both low and high levels of identity overlap (Figure 3.2). At low identity overlap, identity quantity was positively associated with identity expression, $B = .09$, $SE = .03$, $t(107) = 2.68$, $p = .01$, whereas at high identity overlap, this relationship was negative, $B = -.14$, $SE = .04$, $t(107) = -3.52$, $p < .00$. Thus, having many different and distinct ways of identifying oneself seemed to facilitate the individual's perceived ability to freely and clearly express their identities. Identifying with many overlapping social categories, however, appeared to inhibit identity expression. The particular nature of the interaction should also be noted, though. Specifically, it would appear that people with few, but highly overlapping identities felt freer to express themselves than people with few, but non-overlapping identities, $t(30) = -2.89$, $p = .01$. This effect appeared to reverse as number of identities increased such that people with many distinct identities felt greater liberty to express these identities than people with many overlapping ones. Although this trend is apparent the effect was not statistically significant, $t(39) = 1.45$, $p = .15$.

The analysis performed on the measure of social support, also generated effects comparable to those found for well-being. Again, although there were no significant main effects of either identity overlap or identity quantity, the overlap X quantity interaction was again significant, $B = -.04$, $SE = .01$, $t(107) = -2.73$, $p < .001$. Further analysis revealed that identity quantity was positively associated with social support at low, $B = .09$, $SE = .03$, $t(107) = 3.03$, $p = .01$, but not high, $B = -.04$, $SE = .04$, $t(107) = -.94$, $p = .35$, levels of identity overlap (see Figure 3.3).

We also assessed the extent to which the identity value variables (perceived by the self and others) moderated the relationship between identity quantity and well-being and identity quantity

X overlap and well-being. Analyses revealed non-significant effects (self-perceived value: $B = -.03$, $SE = .04$, $t(107) = -.84$, $p = .40$; $B = .78$, $SE = .66$, $t(107) = 1.18$, $p = .24$, respectively. Socially perceived value: $B = .82$, $SE = .48$, $t(107) = .17$, $p = .10$; $B = .00$, $SE = .02$, $t(107) = .16$, $p = .87$, respectively).

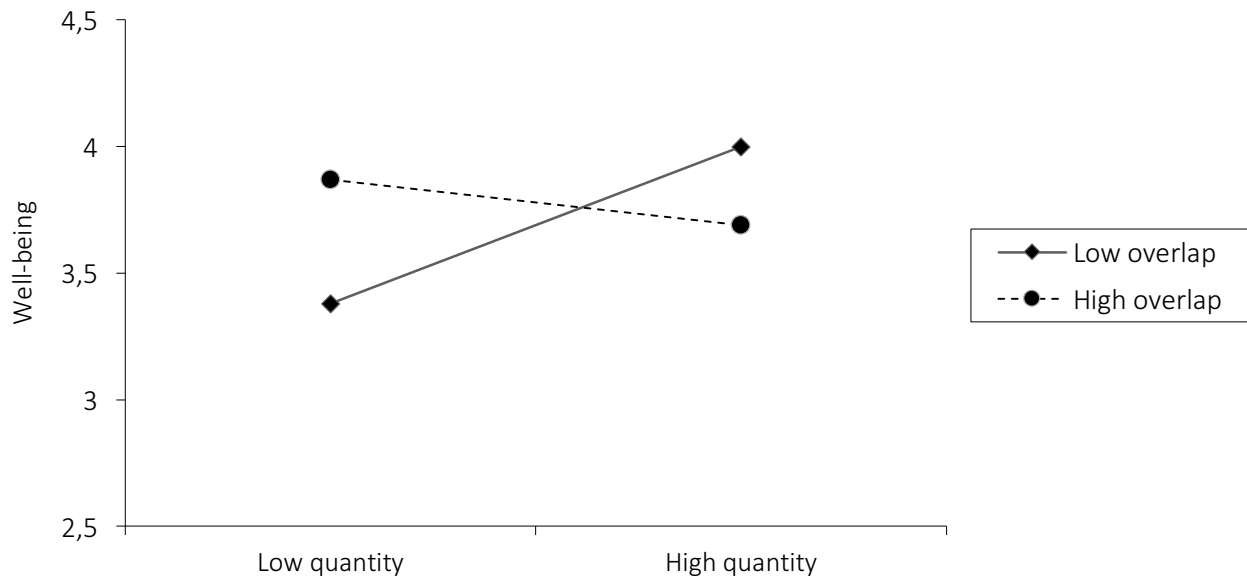


Figure 3.1. Interaction between identity quantity and overlap on well-being.

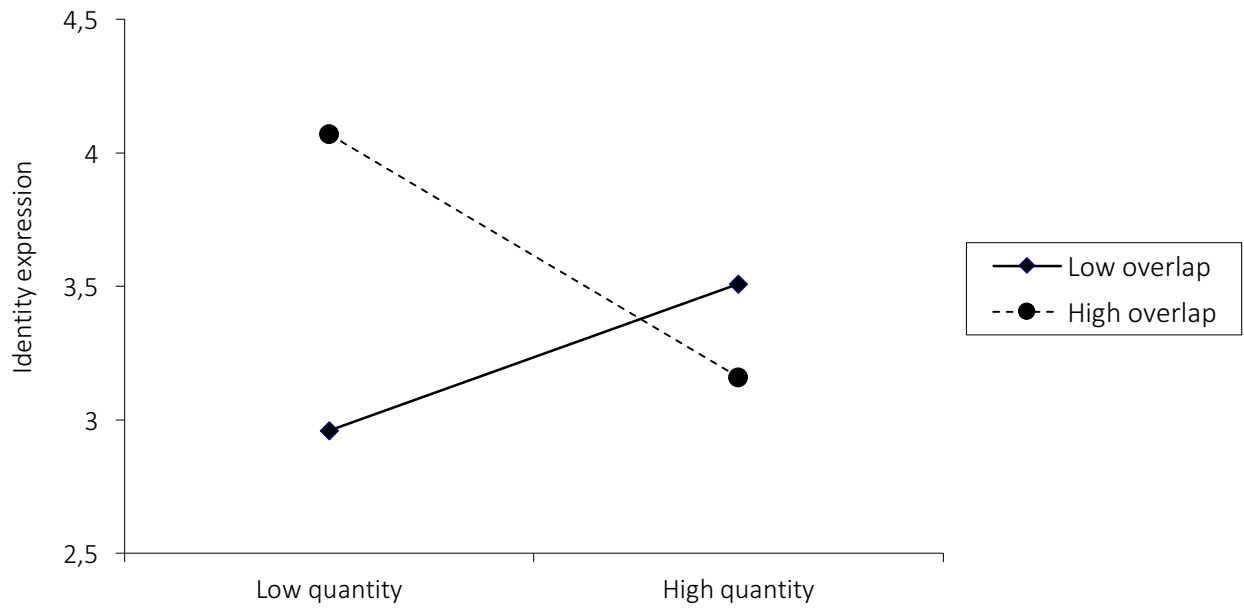


Figure 3.2. Interaction between identity quantity and overlap on identity expression.

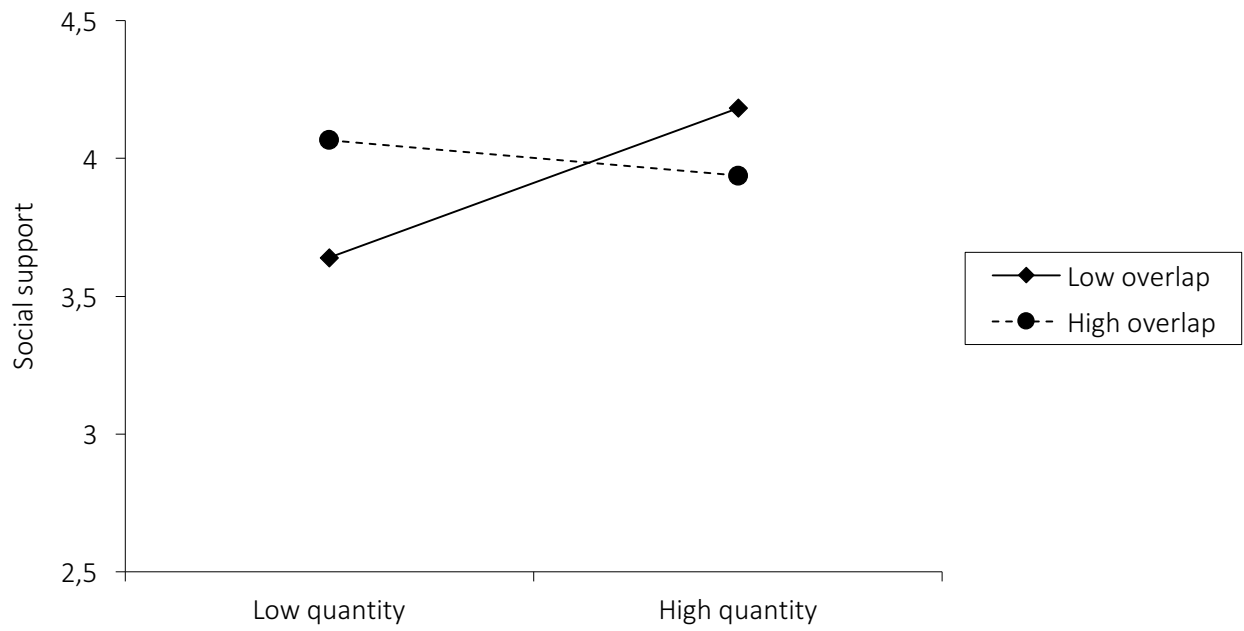


Figure 3.3. Interaction between identity quantity and overlap on perceived social support.

Mediation analysis

Given the fact that our theoretical framework placed well-being as the ultimate outcome variable, we considered whether the effects of identity complexity on the DV were mediated by identity expression and social support. To test the mediating role of identity expression, this was included in the regression equation predicting well-being along with identity overlap, identity quantity, and the overlap X quantity interaction. In this analysis, the previously significant overlap X quantity interaction became non-significant, $B = -.01$, $SE = .02$, $t(106) = -.78$, $p = .44$. This was replaced by a significant main effect for identity expression on well-being, $B = .30$, $SE = .08$, $t(106) = 3.41$, $p < .01$, suggesting that identity expression mediated the effect of the overlap X quantity interaction on well-being.

The same analysis was repeated with social support instead included as a possible mediator. Similarly, the previously significant interaction became non-significant, $B = -.02$, $SE = .01$, $t(106) = -1.57$, $p = .12$. Again, this interaction was replaced by a significant effect of the mediator (social support) alone, $B = .28$, $SE = .09$, $t(106) = 2.98$, $p < .01$, suggesting that social support also mediated some of the effects of the overlap X quantity interaction on well-being. This pattern of dual mediation via identity expression and social support was confirmed in a bootstrapping analysis testing the significance of the indirect paths (Preacher & Hayes, 2008). Path analyses of the relationship are presented in Table 3.3, and the indirect effects of overlap X quantity on well-being via identity expression and social support are shown in Table 3.4. Both indirect effects are significant at $p < .05$ (95% CI). These relationships are depicted graphically in Figure 3.4.

Table 3.3 Impact of Quantity X Overlap on mediator variables and of mediator variables on well-being

Path	Mediator	Coeff.	SE	t	p
IV to Mediators	Social support	-.03	.01	-2.31	.02
	Id. Expression	-.05	.01	-4.26	.00
Mediators to DV	Social support	.28	.09	2.98	.00
	Id. expression	.20	.09	2.20	.03

Table 3.4 Indirect effects of Identity Quantity on Well-being via mediators and at different levels of Identity Overlap.

Mediator	Id. Overlap level	Effect	Boot SE	Boot CI (95%)	
				low	high
Id. Expression	Low	.03*	.01	.01	.06
	High	-.04*	.02	-.08	-.01
Social support	Low	.03*	.01	.00	.06
	High	-.01	.01	-.04	.01

Note: 5000 bootstrap samples, *significant at $p < .05$.

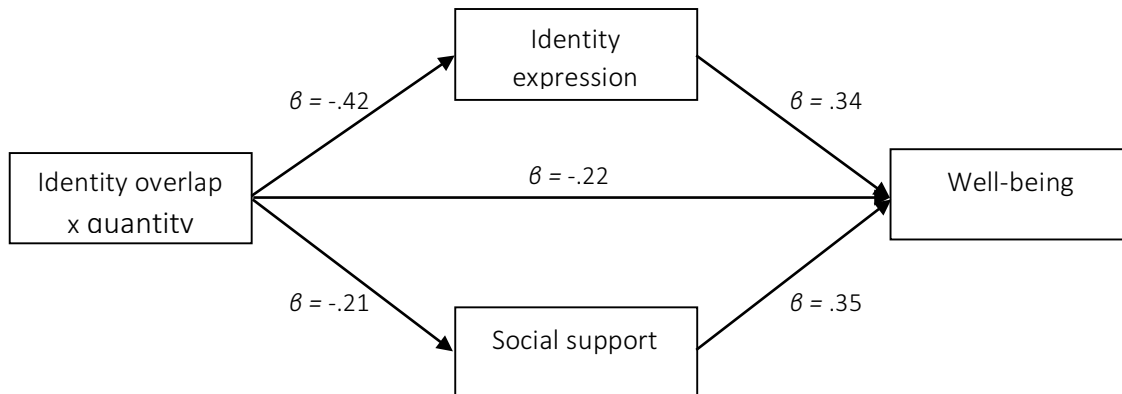


Figure 3.4 Relationship between identity overlap by identity quantity interaction and well-being as mediated by social support and identity expression.

Discussion

The aim of this study was to examine the relationship between multiple group memberships and well-being. In line with a growing body of research (Binning et al., 2009; C. Haslam et al., 2008; Jetten et al., 2012; J. M. Jones & Jetten, 2011), our results demonstrated that multiple group memberships contribute to well-being. But, importantly, this contribution is dependent on more than the sheer number of group memberships to which the individual has access. Consistent with theorizing about social identity complexity (Roccas & Brewer, 2002), the effect of multiple group memberships was contingent on perceived identity overlap. Specifically, it was multiple non-overlapping (i.e., distinctive) group memberships that contributed most positively to individual well-being. Moreover, consistent with the ideas outlined in Chapter 1, we tested whether this effect was mediated by the individual's perceived access to social support and the reported ease of self-expression. Our results indicated that this indeed was the case, with multiple non-overlapping identities increasing perceived social support and identity expression, which in turn contributed to well-being. By contrast, multiple overlapping identities detracted from identity expression, and through this, well-being.

The dual mediation effect of social support and identity expression makes theoretical sense. It is likely that belonging to social categories that are well defined and separate facilitates access to these groups in society. In turn, this creates more avenues through which individuals can ground themselves, gain social support, and ultimately increase well-being through an extensive and diverse social network. On the other hand, if social categories are highly overlapping, and thus consist of largely the same groups and people, social support might be comparatively limited. This finding sits well within the context of past research connecting multiple group membership with social support and well-being (e.g., C. Haslam et al., 2008).

The role of multiple non-overlapping groups in contributing to well-being via the individual's perceived ability to self-express, however, is slightly more complicated. As discussed in Chapter 2, relevant to understanding this link, past research has indicated a positive relationship between well-being and self-verification – that is, people's desire to be perceived by others as they perceive themselves (Bargh, McKenna, & Fitzsimons, 2002; Gauler, Carroll, & Hutchinson, 2011; Lloyd & Duveen, 1991; W. B. Swann et al., 1989). Effective identity expression is likely to be instrumental in attaining self-verification, and the processes of enacting the self successfully to multiple others could help explain the observed connection between self-expression and well-being. Similarly, in terms of the effects of multiple non-overlapping groups on identity expression, we suggest that belonging to such multiple distinctive groups provides the individual with not only a clearer idea of the unique features of these groups, but also a firmer understanding of the self in relation to other individuals and groups. Both of these things, and the increased opportunities multiple groups provide for rich and varied identity expressions, may facilitate the precise and effective communication of the self to others in ways that contribute to well-being.

The findings also suggest that while multiple group membership can contribute to perceived ease of expressing oneself (and in turn well-being) for people with discrete identities, the opposite is true for people with many highly overlapping identities. That is, for people high in identity overlap, a greater number of identities actually inhibits expression and thus undermines well-being. This effect likely occurs as a self-concept comprising many overlapping identities is presumably harder to disentangle, causing the self to become fuzzy and muddled, and relatively difficult to define in its entirety. This may make it particularly challenging for the individual to express him- or herself clearly and effectively. By contrast, the ease of identity expression appears to be greater for people with few and highly overlapping identities than for people with few and distinct identities

(Figure 3.2). This makes sense when considering the notion that having few and highly overlapping identities probably means that the individual belongs to relatively similar groups that are easy to consolidate and express in comparison to a self-concept comprising few and disparate group memberships. Overall, these findings demonstrate a situation in which a central component of high SIC (in this case identity distinctiveness or low overlap) is relatively unfavorable.

Thus, contrary to the idea that more identities are always better, these results show that the relationship is more complex. Indeed, it would appear that in general the more *and the more distinct* the social identities are, the clearer and easier it becomes for the individual to enact them and gain support from others. These things, in turn, translate into increased well-being. However, multiple group memberships can also be maladaptive, and fewer identities can actually be relatively beneficial (i.e., when these identities are non-distinct). Said differently, membership in highly overlapping groups can sometimes be a good thing, whereas belonging to disparate groups can sometimes be a burden – namely, in the context of relatively few identities.

Finally, in line with past research, we expected identity value to moderate the effects of identity quantity and overlap on well-being. However, our results did not support this notion. A possible reason for this lacking effect could be that we did not include a measure for the extent to which the given identities were visible to others. Previous studies have indicated that the experience of belonging to obviously stigmatized groups (e.g. based on skin color) is different from belonging to less apparent groups that are easier to conceal (e.g. mental illness) (D. M. Quinn, 2006; D.M. Quinn & Chaudoir, 2009; D. M. Quinn & Earnshaw, 2013). The fact that we did not account for this variation could be the reason that there were no moderation effects of identity value in our results.

Study 2

Study 1 demonstrated the importance of the distinctiveness of the groups to which the individual belongs. However, we were also interested in the importance of various other features of group memberships in framing implications for individual well-being. As discussed in detail in Chapter 2, these relate primarily to whether the groups to which one belongs are perceived by others as socially valued or devalued (i.e. stigmatized; e.g. Schmitt et al., 2014) and compatible or incompatible (Brook et al., 2008). That is, regardless of the distinctiveness of the individual's group memberships, belonging to a stigmatized group, for example, may represent a psychological burden as well as prevent the individual from accessing the social support and solidarity these other groups represent. This, in turn, may have repercussions for well-being (Barreto & Ellemers, 2003; Schmitt et al., 2014). In addition, aligning such socially devalued group memberships in the self-concept with others that are more neutral or positive, may be complicated practically (i.e., others may not accept such integration and reject the person based on the stigma) and give rise to identity incompatibility (Fleischmann & Phalet, 2015). Similarly, this may negatively affect well-being in several ways. For example, the experience of identity conflict may be mentally straining for the individual (Brook et al., 2008). Further, given the process of identity incompatibility – that is, that one identity is effectively devalued or stereotyped in the context of another (e.g., *male* and *midwife*) – belonging to such conflicting groups may place limits on the psychological and material benefits of multiple group membership in much the same ways as a stigma would (Fleischmann & Phalet, 2015).

Thus, while possessing multiple distinctive identities is clearly an important contributor to well-being (Study 1), consideration of these other factors extends the current focus on identity distinctiveness as the only indicator of positive identity complexity. In other words, interpreting the

well-being effects of multiple group memberships solely by the extent of their overlap versus distinctiveness probably does not tell the whole story. Our second study explored this possibility.

In Study 2, we again examined the relationship between multiple identities and well-being. However, given the above rationale, we believed that assessing features of identity compatibility and value should call to mind a set of questions about multiple group memberships different to those concerning overlap or distinctiveness. Specifically, questions about identity value and compatibility highlight the socially defined content and meaning of multiple groups, and thus consider whether multiple group memberships can easily be reconciled and negotiated or not, rather than whether the individual is unique by virtue of belonging to these groups. Further, while we did assess identity value in Study 1, we did not include a measure of the extent to which such value was visible to others or not. This might be of significant import as belonging to a visibly stigmatized group (e.g., physically disabled, ethnic minority) as opposed to a concealable one (e.g., sexual orientation) may have different consequences for individual well-being (D. M. Quinn, 2006; D.M. Quinn & Chaudoir, 2009; D. M. Quinn & Earnshaw, 2013). Thus, we examined two extra features of identity, which we believed would influence the consequences of multiple group membership for well-being: The value of one's identities in the eyes of others (i.e., visible vs invisible identity value) and the degree to which those identities are compatible or not.

In sum, we expected that the well-being consequences of (multiple) group memberships would be related to, (1) the social value of these groups (i.e., whether some of these were stigmatized), (2) the degree to which these group memberships were obvious to others (visible vs. invisible), and (3) whether the group memberships and their associated identities were perceived as compatible. Specifically, we expected that multiple group memberships would be positively related

to well-being only when the component identities were visibly socially valued rather than visibly devalued. Membership in visibly stigmatized groups was thus expected to detract from individual well-being. We further reasoned that belonging to multiple, stigmatized groups should be associated with a sense of incompatibility within one's matrix of group memberships. This sense of incompatibility should, in turn, relate negatively to well-being. Finally, and similar to the previous study, we expected that possessing visibly stigmatized and/or incompatible identities would strongly determine interactions with others and therefore make it difficult to express the self fully (i.e., in terms of the other identities that one might possess) and to access social support and inclusion from others. Thus, in this study, we tested three possible mediators of the well-being effects of multiple group memberships: Self-expression, social support, and social inclusion.

Method

Participants

The survey was conducted online and advertised in an identical fashion to Study 1. In response to advertising, a sample of 144 adults was recruited. Of these, 40 cases contained missing data and were therefore not included. The final sample of 104 participants included 17 males and 86 females. The majority of these (55.6%, $n = 58$) were between 20 and 30 years old. A total of 20 different nationalities was included in the sample, with the majority 67.3% ($n = 70$) being from Australia (40.4%, $n = 42$) and the UK (26.9%, $n = 28$). The most common occupation was *university student* (63.5%, $n = 66$), followed by *other* (13.5%, $n = 14$), and *academic* (11.5%, $n = 12$). The sample included 11 different ethnicities, but the vast majority of participants identified themselves as White (76%, $n = 70$).

Survey and measures

Similar to Study 1, participants were first instructed to list as many of their social identities that they could think of. They then chose the four most important identities before responding to a series of items focusing on various aspects of social identity (compatibility, visibility, value, expression). Participants then completed a measure of psychological well-being.

Identity measures. Identity quantity was measured as described above. Identity visibility was measured for the top four identities with a single item created for the study ('To what extent do you feel that your membership with the category [X] is generally obvious to others?' 1 = Not at all, 5 = Very much so). Similarly, the measure of identity value was gauged with a single item, 'To what extent do you think your membership with [X] is considered positively or negatively by others in the community/society in which you live?' The item was measured using a 5-point Likert scales with 1 = Generally negative, 5 = Generally positively). Composite scores were created for each of these measures by averaging ratings across the four identities participants had chosen.

We measured identity importance using the same three-item scale as in Study 1 ($\alpha = .84$). Next, the degree of perceived compatibility between each possible pairing of participants' four most important identities (i.e. 'Thinking about [group X] and [group Y], how easy or difficult is it to belong to these two groups/social categories at the same time?') was measured on 5-point Likert scales (1 = very difficult, 5 = very easy). The average compatibility score for all six identity pairings was then calculated to obtain an overall measure of identity compatibility.

After rating each of their chosen identities on these dimensions, a number of more general questions about the self and identity were asked that did not refer to the specific groups. The three-item measure of identity expression from Study 1 was used again in Study 2 ($\alpha = .79$).

Similarly, the three-item measure of perceived access to social support from Study 1 was also reused here ($\alpha = .82$). Finally, we also included a two-item scale for perceived social inclusion which was developed for the study (scale reliability $\alpha = .93$) ('Generally, I feel included by my peers in the community', 'Generally, I feel accepted by my peers in the community').

Well-being measure. Psychological well-being was assessed using the same 11-item General Well-being index (GWBI) (Hopton et al., 1995) as in Study 1.

Results

Analytic strategy

Data analysis was conducted in two steps. First, descriptive statistics (means, standard deviations (SD), correlations) were generated for the variables to provide a general overview of participant responses and variable relationships. Next, guided by the preliminary results as well as by the study hypotheses, regression and path analyses were conducted to determine in detail any statistically significant associations between the identity and well-being variables. Of primary interest were the hypothesized relationships between well-being and the reported number of identities, the perceived identity value and visibility of the identities, as well as their compatibility. For the path analysis, the modelling macro tool, PROCESS (Hayes, 2012), was used.

Descriptive findings

On average, respondents listed a total of just over seven ($M = 7.36$, $SD = 3.38$) social identities that they believed defined them in some way. These identities related to range of different group memberships. Some were based on large categories such as nationality, gender, ethnicity, religious conviction, while others described smaller groups, such as movie enthusiast, animal lover, musician,

etc. The perceived compatibility of participants' identities was generally high ($M = 4.10$, $SD = 0.82$). The other identity and outcome variables yielded average scores significantly greater than the scale midpoint of 3.00, except for identity expression ($t = -.38$ (103), $p = .70$; see Table 3.5). Thus, in general, participants listed socially valued and highly visible identities, low in inter-identity conflict.

Table 3.5 Mean statistics for identity and well-being variables

Variable	Mean	Std. dev.	Minimum	Maximum
Identity quantity	7.36	3.38	4.00	18.00
Identity compatibility	4.10*	0.82	1.00	5.00
Identity visibility	3.38*	0.82	1.00	5.00
Identity value	4.10*	0.64	2.50	5.00
Identity expression	2.97	0.90	1.00	5.00
Social support	4.17*	0.77	1.00	5.00
Social inclusion	3.88*	1.01	1.00	5.00
Well-being	3.48*	0.67	1.36	4.80

* Mean departs from scale midpoint (3) significantly at $p < .001$.

Next, correlations for the main identity and outcome variables were calculated to provide a preliminary assessment of any statistically significant relationships (see Table 3.6). Significant positive correlations were evident between identity quantity and identity value ($\beta = .23$, $p < .05$), social support ($\beta = .26$, $p < .05$), and social inclusion ($\beta = .26$, $p < .05$). Similarly, identity compatibility ($\beta = .37$, $p < .05$) and identity value ($\beta = .28$, $p < .05$), were both positively associated with social inclusion. Finally, identity expression correlated positively with both social support ($\beta = .23$, $p < .05$), and social inclusion ($\beta = .23$, $p < .05$). Thus, the participants who listed greater numbers of identities generally perceived their identities to be of high value, felt socially included, and had greater access to social support. Further, those who described their identities as highly compatible and of high value felt more socially included (see Table 3.6). Identity quantity per se, however, was not correlated with well-being.

Table 3.6 Correlations between identity and well-being measures

Variable	1	2	3	4	5	6	7	8
1. Identity quantity	-	.07	.09	.23*	-.04	.26**	.26**	-.01
2. Identity compatibility		-	.19	.12	-.00	.13	.37**	.11
3. Identity visibility			-	.76	-.18	.01	.16	.12
4. Identity value				-	.02	.14	.28**	.07
5. Identity expression					-	.23*	.23*	.15
6. Social support						-	.62**	.27**
7. Social inclusion							-	.29**
8. Well-being								-

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

Regression analyses

Regression analyses were undertaken to further determine the specific nature of the relationships among the variables. Well-being was used as the main dependent variable (DV). The independent variables (IVs) identity quantity, identity visibility, identity value, and identity compatibility were of principal interest in accordance with the stated hypotheses. There were no significant main effects of identity quantity ($B = -.01$, $SE = .02$, $t(98) = -.31$, $p = .76$), identity visibility ($B = .11$, $SE = .08$, $t(98) = 1.31$, $p = .19$), identity value ($B = .05$, $SE = .11$, $t(98) = .49$, $p = .63$), or identity compatibility ($B = .07$, $SE = .08$, $t(98) = .79$, $p = .43$) on well-being. Nor were there any interactions among these variables (all $p > .05$).

Exploring the data further and in line with the hypotheses, we performed these analyses on the expected mediator variables of social inclusion, social support and identity expression. For social inclusion, main effects were evident for identity quantity ($B = .06$, $SE = .03$, $t(98) = 2.18$, $p = .03$) and identity value ($B = .29$, $SE = .13$, $t(98) = 2.12$, $p = .04$), as well as for identity compatibility ($B = .38$, $SE = .10$, $t(98) = 3.57$, $p < .001$). Further, the three-way interaction of identity quantity, identity value, and identity visibility was significantly related to social inclusion ($B = .15$, $SE = .05$, $t(98) = 3.06$, $p < .001$). To decompose the interaction, the correlation between identity quantity and

social inclusion was examined at low and high identity value and at low and high levels of identity visibility. When identity value was low (i.e., stigmatized), there was a significant positive relationship between identity quantity and social inclusion when identity visibility was also low ($B = .20$, $SE = .06$, $t(98) = 3.30$, $p < .001$) but not when identity visibility was high ($B = -.08$, $SE = .06$, $t(98) = -1.30$, $p = .20$). When identity value was high (i.e., non-stigmatized/positive), there were only weak (non-significant) positive relationships between identity quantity and social inclusion regardless of the level of identity visibility (Low: $B = .05$, $SE = .04$, $t(98) = 1.22$, $p = .22$; High: $B = .08$, $SE = .05$, $t(98) = 1.80$, $p = .07$; see Table 3.7 & Figure 3.5). Thus, identity quantity only contributed to social inclusion, when stigmatized identities formed part of the individual's self-concept and when those identities were invisible.

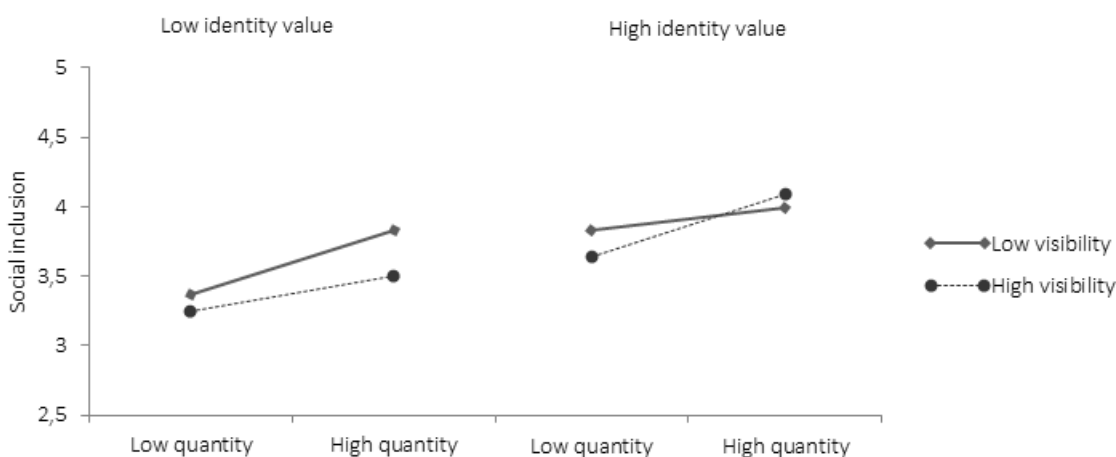


Figure 3.5 The association between identity quantity and perceived social inclusion at high and low visibility and value.

Looking at social support as the other expected mediator, analyses revealed main effects of identity quantity ($B = .06$, $SE = .02$, $t(98) = 2.53$, $p = .01$), but not identity visibility ($B = .00$, $SE = .09$, $t(98) = .03$, $p = .98$), identity value ($B = .08$, $SE = .12$, $t(98) = .67$, $p = .50$) or identity compatibility ($B = .09$, $SE = .09$, $t(98) = 1.08$, $p = .29$). However, identity quantity, visibility and value again interacted to impact significantly on social support ($B = .14$, $SE = .03$, $t(98) = 3.57$, $p < .001$). To decompose the

interaction, the correlation between identity quantity and social support was examined at low and high identity value and in turn at low and high levels of identity visibility. This revealed several significant main effects. When identity value was low, there was a significant positive relationship between identity quantity and social support when identity visibility was also low ($B = .14$, $SE = .04$, $t(98) = 2.88$, $p = .01$), but not when identity visibility was high ($B = -.05$, $SE = .05$, $t(98) = 1.08$, $p = .28$). Further, when identity value was high, there was a significant positive relationship between identity quantity and social support when identity visibility was high ($B = .12$, $SE = .03$, $t(98) = 3.23$, $p < .001$), but not when it was low ($B = .02$, $SE = .03$, $t(98) = .59$, $p = .56$) (see Figure 3.6). The results thus indicated a positive correlation between identity quantity and social support for people with stigmatized identities when these identities were invisible to others, and for people with valued and visible identities.

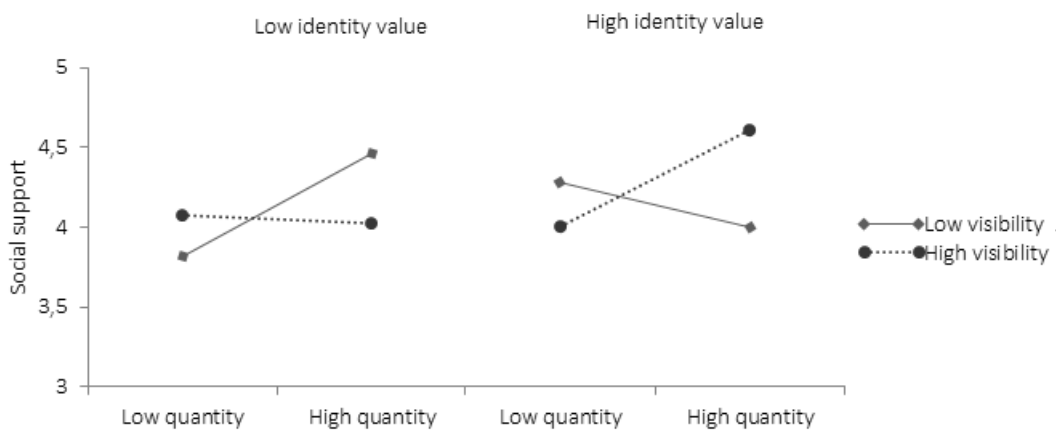


Figure 3.6 The association between identity quantity and perceived social support at high and low visibility and value.

Next, regressing the final expected mediator variable, identity expression, on the primary independent variables revealed no significant main effects. However, the three-way interaction of identity quantity, identity value, and identity visibility was again significant ($B = .13$, $SE = .04$, $t(98) = 2.77$, $p < .01$). When identity value was low, identity quantity was negatively correlated with

identity expression when identity visibility was high ($B = -.20$, $SE = .06$, $t(98) = -3.21$, $p < .001$), but not when visibility was low ($B = -.02$, $SE = .06$, $t(98) = -.30$, $p = .76$) (see Table 3.7 & Figure 3.7).

Further, when identity value was high, identity quantity correlated positively with identity expression when identity visibility was high ($B = .10$, $SE = .04$, $t(98) = 2.16$, $p = .03$), but not when visibility was low ($B = -.00$, $SE = .04$, $t(98) = -.03$, $p = .97$). As such, a greater number of identities inhibited social expression when identities were stigmatized and visible. When identities were socially valued and visible, however, the quantity of identities facilitated expression.

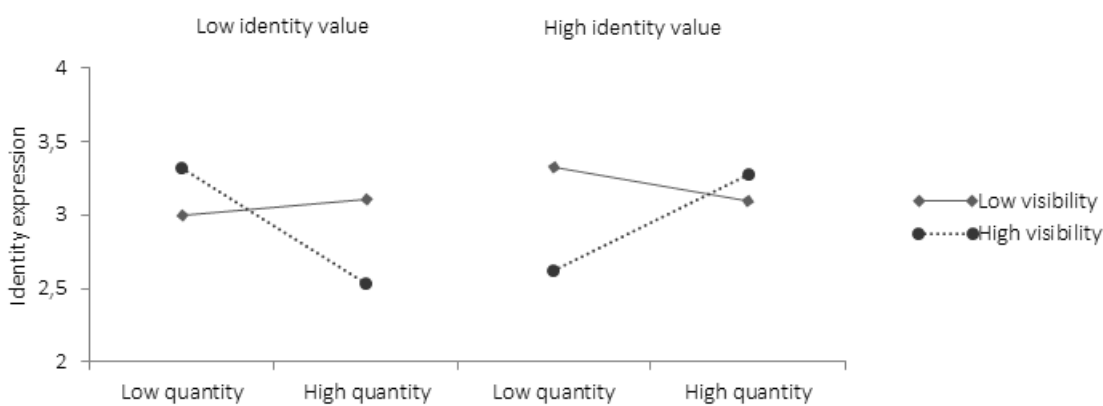


Figure 3.7 The association between identity quantity and ease of identity expression at high and low visibility and value.

Given the lacking contribution of identity compatibility as a moderator variable, we reasoned that this construct might fit as an outcome variable. Specifically, we hypothesized that identity stigma might complicate integration of multiple identities in the self-concept and give rise to identity incompatibility. While there were no significant main effects of identity quantity, identity value or identity visibility, the three-way interaction was again significant, $B = .12$, $SE = .04$, $t(98) = 2.93$, $p < .001$. When identity value was low, identity quantity was positively related to identity compatibility when identity visibility was also low ($B = .18$, $SE = .05$, $t(98) = 3.50$, $p < .001$). This relationship was marginally negative in the context of low value but high visibility identities ($B = -$

.10, SE = .05, $t(98) = -1.90$, $p = .06$) (see Table 3.7 & Figure 3.8). Thus, having relatively many identities facilitated identity compatibility when identities were stigmatized but invisible to others. The opposite was true, when stigmatized identities were visible, although this relationship was weaker.

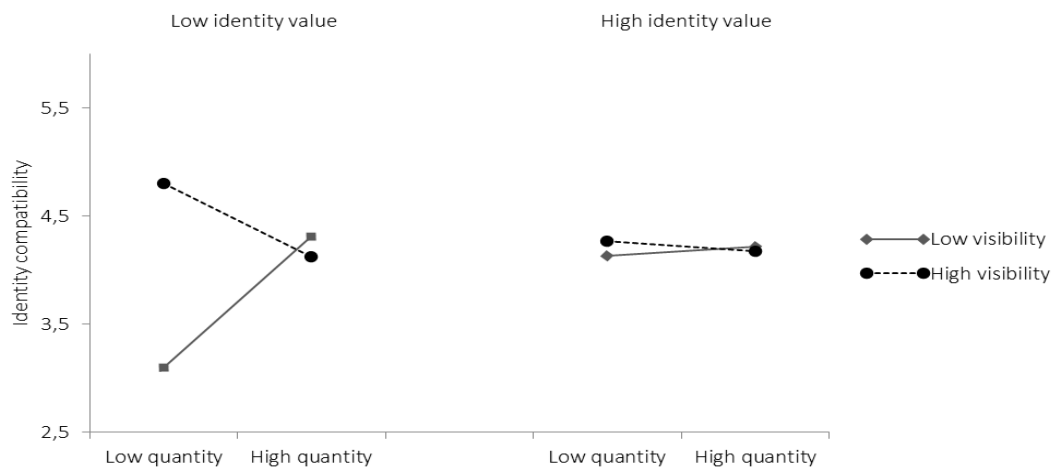


Figure 3.8 The association between identity quantity and perceived identity compatibility at high and low visibility and value.

Finally, several somewhat surprising patterns concerning the nature of the interaction on social support, identity expression, and compatibility should be noted. Specifically, it would appear that people who had relatively few identities were worse off in terms of social support, identity expression, and compatibility when these identities were devalued and invisible than when they were devalued and visible (see Figures 3.6-3.8). The comparable effects on these variables appeared to reverse (though not for compatibility), however, as the number of identities increased, such that people with many identities had access to more social support and found it easier to self-express if those identities were devalued and invisible rather than devalued and visible.

Mediation analysis

While there was no direct relationship between the three-way interaction and well-being, we still tested for mediation given the results obtained in Study 1. Past research has advocated testing for mediation in the absence of direct effects by bootstrapping rather than following the traditional causal steps approach where each path is tested separately. This is justified principally on the grounds that relative to bootstrapping methods, the causal steps approach is considerably low in power, and thus relatively unlikely to detect an effect. In addition, when research is guided by a theoretical model, it is preferable to test the degree to which that model – as originally conceived – fits the data. Although it may seem counter-intuitive to do this when there are no discernible direct effects on the dependent measure, the absence of these also does not preclude validity of the original model (Hayes, 2009; 2013; Hayes & Preacher, 2014). The initial regressions for the current study, which demonstrated significant effects of the interaction IV on each of the hypothesized mediator variables as well as identity compatibility, also guided our expectation of mediation. Results indicated an indirect effect of the interaction variable on well-being via social support, social inclusion, and identity expression. Further, identity expression and identity compatibility mediated the relationship between the interaction variable and social inclusion (Figure 3.9). We also tested whether social inclusion and identity compatibility mediated the relationship between the interaction variable and social support. However, this was not the case.

These significant mediation effects were confirmed in bootstrap analyses testing the significance of the indirect paths. Path analyses and the indirect effect of identity quantity X identity value X identity visibility on well-being via identity expression, social inclusion and social support are presented in Table 3.7 and 3.8. Path analyses and the indirect effect of the interaction variable via identity expression and identity compatibility on social inclusion are shown in Table 3.9 and 3.10,

respectively. The indirect relationships for well-being are significant at $p < .05$ (social support, boot 95% CI low = .01, high = .01; social inclusion, boot 95% CI low = .00, high = .09; identity expression, boot 95% CI low = .00, high = .06) as are those for social inclusion (identity expression, boot 95% CI low = .0049, high = .0964; identity compatibility, boot 95% CI low = .0025, high = .0838).

Table 3.7 Impact of three-way interaction on mediators, and mediators on outcome variable (well-being).

Path	Mediator	Coeff.	SE	<i>t</i>	<i>p</i>
Interaction variable to mediators	Social support	.14	.04	3.57	.00
	Social inclusion	.15	.05	3.06	.00
	Id. expression	.08	.04	2.29	.02
Mediators to outcome variable	Social support	.26	.09	2.79	.01
	Social inclusion	.22	.07	3.04	.00
	Id. expression	.34	.09	3.80	.00

Table 3.8. Indirect effects of identity quantity on well-being via mediators, and at different levels of social acceptance and identity visibility.

Mediator	Identity value	Identity Visibility	Effect	Boot SE	Boot CI (95%) low	Boot CI (95%) high
Social support	Low	Low	.04*	.02	.01	.09
		High	-.01	.02	-.06	.01
	High	Low	.01	.01	-.01	.03
		High	.03*	.02	.00	.09
Social inclusion	Low	Low	.05*	.02	.01	.10
		High	-.02	.02	-.07	.02
	High	Low	.01	.01	-.01	.04
		High	.01*	.01	.00	.05
Id. Expression	Low	Low	-.00	.01	-.05	.02
		High	-.04*	.02	-.09	-.00
	High	Low	-.00	.01	-.01	.01
		High	.03*	.01	.01	.06

* $p < .05$.

Table 3.9. Impact of three-way interaction on mediators, and mediators on social inclusion.

Path	Mediator	Coeff.	SE	t	p
Interaction variable to mediators	Id. Compatibility	.12	.04	2.93	.00
	Id. Expression	.08	.04	2.29	.02
Mediators to outcome variable	Id. Compatibility	.24	.12	1.96	.05
	Id. Expression	.26	.10	2.49	.01

Table 3.10. Indirect effects of identity quantity on social inclusion via mediators, and at different levels of social acceptance and identity visibility.

Mediator	Identity value	Identity Visibility	Effect	Boot SE	Boot CI (95%)	
					low	high
Id. Expression	Low	Low	-.01	.03	-.04	.05
		High	-.05*	.03	-.12	-.00
	High	Low	-.00	.01	-.02	.02
		High	.02*	.02	.00	.06
Id. Comp- atibility	Low	Low	.04*	.02	.01	.14
		High	-.02*	.02	-.08	-.00
	High	Low	.00	.01	-.02	.04
		High	-.00	.01	-.04	.03

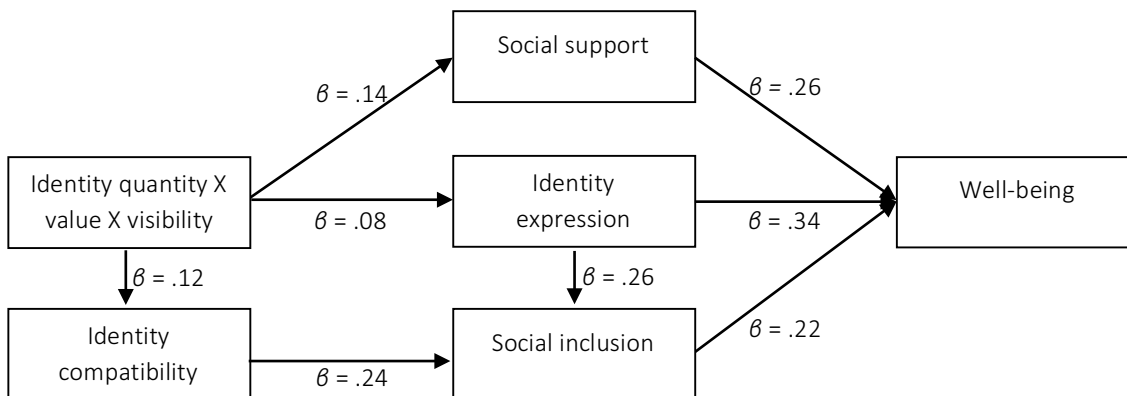


Figure 3.9 Relationship between the three-way interaction of identity quantity, identity visibility on well-being as mediated by social support, social inclusion, identity compatibility and identity expression.

Discussion

While Study 1 focused purely on the more descriptive and subjective nature of group memberships, the framework for Study 2 included the socially defined features of multiple group memberships. The results indicated that the perceived social value attached to the individual's identities and the visibility of this value, impacted on well-being. This effect, however, was not direct, but rather mediated by social support, social inclusion, identity expression, and identity compatibility. Specifically, multiple group membership contributed to well-being via social inclusion and social support if the component identities were either stigmatized, but concealable (i.e. invisible), or socially valued and visible. These patterns make theoretical sense in relation to the broader literature on stigma. If the multiple groups to which the individual belongs are high-status and membership in these is obvious (e.g., being White in a majority White society), then access to the benefits associated with social support and inclusion is likely to be relatively easy and nearly automatic. This, in turn, impacts positively on well-being. Similarly, if the individual belongs to a stigmatized group, the negative well-being effects (e.g., social ostracism) that may follow from this can likely be avoided if the stigma is concealable (e.g., sexual orientation) rather than visible (e.g., physical disability). Further, consistent with past research, multiple identities can probably more effectively buffer against the psychological consequences of an invisible stigma than a visible one (Ellemers & Barreto, 2006; Mussweiler et al., 2000).

In the same vein, the mediating role of identity expression makes sense in relation to the previously mentioned self-verification processes. In the present study, there was a positive relationship between effective identity expression and increased social inclusion, and in turn with well-being. As discussed previously, identity expression ultimately pertains to conveying and enacting one's multiple identities in the social world. Doing this successfully communicates the

nature of the social categories to which one belongs, thus facilitating meaningful ties to similar others and in effect greater social inclusion. However, in and of itself, this does not explain the effects observed of multiple group membership at varying levels of identity value and visibility on identity expression. Here we suggest that belonging to multiple valued and visible groups is relatively problem-free and increases opportunity for, and practice of, enacting one's multiple identities. In turn, expression then becomes richer, more varied and ultimately more effective. However, if the groups to which one belongs are stigmatized and visible, effective expression of such identities – as well as others included in the self-concept – may become complicated. For instance, revisiting the previous example from Chapter 2 of a Black man living in a majority White society, for him to effectively express his multiple identities would be relatively difficult given the stigma attached by society to the color of his skin. Communicating his identity as a doctor, for instance, and thus obtaining acceptance and inclusion by this social category, would likely be problematic if his peers were unable or unwilling to see past his race. In effect, he would not be permitted to express himself freely.

While we initially expected identity compatibility to moderate the relationship between multiple group membership and well-being (as indicated by e.g. Brook et al., 2008), we found that this construct instead mediated the relationship with social inclusion, and in turn, well-being. This positive association between identity compatibility and social inclusion is likely due to the fact that having potentially incompatible identities – for example *scientist* and *woman* – complicates one's inclusion in these groups. That is, the tradition that most scientists are male may make it hard for a female scientist to fit in and to be completely accepted in this category (Peters, Ryan, Haslam, & Fernandes, 2012). In contrast, if her profession were more gender neutral (e.g., teacher) or traditionally more female (e.g., nurse) the associated identities would make a socially more

acceptable fit and likely facilitate problem-free inclusion in both social categories (Deaux & Major, 1987; Doosje, Branscombe, Spears & Manstead, 1998).

On the other hand, the connection between multiple group membership and identity compatibility is more complex. Here, we found a positive association, but only when stigmatized identities were invisible. If, however, these identities were visible, multiple group membership tended to inhibit perceived compatibility. These results thus indicate that it may be easier to square multiple devalued identities into a congruous self-concept when these are not obvious. Invisibility presumably affords the individual greater opportunity to actively negotiate and mentally reconcile identities to bring these back into a harmonious state. If these identities are in plain sight, however, any incompatibilities between the different multiple parts of one's self-concept are likely to be more salient and vulnerable to be judged and defined by others, and therefore more difficult to consolidate.

Finally, it should be noted that our results also indicated somewhat counter-intuitive patterns between multiple group membership and social support and identity compatibility and expression. Specifically, for people with few and stigmatized group memberships, feelings of compatibility, self-expression and social support were greater if the associated identities were visible rather than invisible (Figure 3.7-3.9). In terms of social support and identity expression, we suggest that this pattern may stem from the social isolation arising as a consequence of belonging to few and stigmatized identities which are also invisible. That is, the ability and willingness to reach out and connect with similar others for support, is likely hindered and complicated if this involves exposing devalued identities to society at large. By contrast, belonging to a devalued but visible group, represents a situation in which the individual has no control over the prominence of his or her

stigmatized identity. In the context of a self-concept comprising only few group memberships, this may be a relatively good thing as self-expression and social support is then likely to be more clear-cut. That is, if a Black person in a racially divided society has few options for social identification and primarily identifies by race, self-expression is relatively uncomplicated. Further, this person may be denied access to certain social categories because of his or her skin color, but accepted in others. In other words, it will be clearer for this person where he or she may be included and supported, or rejected and discriminated against. Similarly, in terms of identity compatibility, belonging to few groups that are highly visible and stigmatized leaves the individual with little other choice than to accept their obvious membership in these groups, and somehow combine the associated identities into a congruous self-concept. If these identities are invisible, however, the individual may not feel the same outside pressure or need to merge their identities into a cohesive self, leaving the incompatibility unresolved. Thus, the effects of identity value change dramatically depending on the visibility of the given identity. This may help explain why we did not find any significant effects of identity value in Study 1 where we failed to include a measure of identity visibility, and therefore were unable to disentangle the effects in this fashion.

General discussion

Study 1 showed that SIC moderated the benefits of multiple group membership, which in turn were mediated by identity expression and social support. The greater the number of identities and the more distinct those identities, the greater the ease of self-expression and social support, and the greater the sense of well-being. In Study 2 we looked at how the socially determined features of specific component identities in their immediate social context (i.e., whether identities are

stigmatized and/or visible) shaped the association between multiple group memberships and well-being. In this study, individuals benefited most from multiple group membership when their identities were stigmatized but invisible or high-value and visible. Further, the results indicated that this connection was mediated by identity expression and social support, and that identity expression and identity compatibility mediated social inclusion and in turn well-being.

Integrating the results from both Study 1 and 2, these findings offer a deeper understanding of the implications for individual well-being of belonging to multiple groups. The findings from Study 1 emphasize the more descriptive features of group memberships by tapping into the individual's sense of group boundaries and clarity, and examine how this may support or inhibit associated benefits. The well-being effects observed in this context appear to be determined by the extent to which the individual belongs to many groups, each of which represents a well-defined and discrete cluster of similar others, thus constituting a unique source of expression and support. The results from Study 2, on the other hand, activate a different framework for interpreting the effects of multiple group memberships by focusing more on the social meaning and value of these. That is, rather than centering on the extent of the physical boundaries of groups, this study examines their meaningful content and ascertains the degree to which such content may enable or place limits on social support and inclusion, identity expression and compatibility. Indeed, this study found that visible stigma blocked the benefits of multiple group memberships. Importantly, we also found that while overlap and stigma may sometimes lessen the well-being effects of multiple group memberships, there are also situations where more group memberships are actually maladaptive (in terms of compatibility in Study 2 and expression in Study 1).

In this way, the results generated by these two studies together identify a set of factors that, in different situations and capacities, may both facilitate and impede the previously demonstrated benefits of belonging to multiple groups. Focusing purely on the descriptive facets of group memberships, it would appear that the more and the more distinct the component identities, the better off the individual is in terms of well-being. However, there is also an indication that the more and the more overlapping the identities, the worse off the individual is. Once the social meaning of these group memberships is accounted for, however, the nature of the relationship changes and the benefits of group membership becomes more defined by the social context in which the individual exists and the social perception of the given group memberships. That is, in this respect the well-being consequences of multiple group membership is more about what the current social environment permits based on the socially determined value of the specific groups to which the individual belongs. Thus, beyond that of the individual's own interpretation and acknowledgement of the boundaries of his or her group memberships (i.e. distinctiveness vs. overlap), the present broader social environment also features as both a potential obstacle, inhibitor (in terms of compatibility) and facilitator of the benefits of group membership.

Limitations

There are a few limitations to these studies that should be noted. First, the method used to measure identity importance, value, and visibility was based on averaging the individual scores for the four identities that participants were asked about. Acknowledging the fact that people might belong to groups that differ greatly in terms of these characteristics, this method might be somewhat problematic. For example, the effects of belonging to a heavily stigmatized category might not register proportionately if the individual rating of the associated identity is counterweighed by three positive or even neutral identities. Further, in terms of identity visibility,

averaging presents a special problem by not accounting for exactly which identities are visible or invisible. As our data indicates, this matters a great deal when it comes to identity value. In other words, using averages to estimate overall identity value, visibility, and importance, might muddle the true effects of these variables. Considering the fact that we found significant correlations in spite of these limitations, one could speculate that our results would only strengthen if these methodological issues were accounted for. This, of course, remains to be empirically tested.

We also acknowledge two limitations related to the measure of identity overlap. First, as outlined in the methods section, in line with Roccas and Brewer (2002), we asked participants to gauge the overlap between each pair of chosen identities. However, in order to keep the survey as short as possible and minimize the risk of participant fatigue, we chose to instruct participants only to estimate the overlap between, for example, group 1 and 2 and not vice versa. As such, this might only tell part of the story if the degree of overlap is dependent on which group is compared to the other. That is, most (religious) Italians might be Catholic, but most Catholics are not Italian. Again, exploring the details of individual identities and their combinations is something for future research. However, as a broad starting point, these studies suggest value in pursuing these questions further.

Second, in spite of the variation in the number of reported identities (minimum = 4, maximum = 21), the overlap measure is only ever based on four of those identities. That is, for people who report few identities, the overlap measure would account for most of their total identity overlap. For people who report many identities, however, the overlap measure would account for a smaller part of their total overlap. Thus, by virtue of our method, we were only able to capture partial identity overlap in people who reported more than four identities. While we asked participants to

focus on their four *most important* identities, thus presumably activating these identities over any others during study participation, this method may nonetheless have diluted the strength of the measured relationships somewhat. Considering these two limitations to the assessment of identity overlap, including a more complete measure of identity overlap in future research might give a clearer picture of the contribution of identity complexity to well-being.

Conclusion

The findings reported here demonstrate that there is indeed more to the relationship between multiple group membership and well-being than the sheer number of identities at a person's disposal. We have presented evidence for the idea that the quantity of identities available to a person does predict well-being, but also that this relationship is dependent on the value and visibility of those identities as well as their perceived overlap. Further, the relationship is mediated by identity expression, identity compatibility, social inclusion and social support. In many ways, the processes that underpin the association between multiple group membership and well-being represent the most important findings of this study. First, they link the individual's perception of the categories that he or she connects with (i.e., identity distinctiveness) to the outward enactment of the associated identities (identity expression and social support), and the consequent benefits (well-being). Second, they highlight the importance of the socially anchored meaning attributed to group memberships (stigmatisation and its visibility) to the way in which the individual is able to present the self socially (expression) and integrate his or her multiple identities into a coherent and supportive self-concept (identity compatibility). In turn, this facilitates greater understanding of how and when multiple group memberships support and protect or undermine and fragment the self, and of the costs and benefits this may have for personal well-being.

Chapter 4

Sometimes less is more: The moderating effects of identity compatibility on individual well-being.

In the previous chapter, we reported two correlational studies that found that the relationship between multiple group membership and well-being was moderated by identity overlap, stigma and visibility and mediated by social support, social inclusion, identity expression and identity compatibility. These findings provide a basis on which to argue that, in addition to the sheer number of multiple groups, the group features – in terms of their descriptive properties as well as their socially defined meaning – also determine their effect on well-being. A central limitation to these results, however, is that they are based on correlational research designs. Thus, while we designated certain variables as antecedents, mediators, and outcomes on a theoretical basis, we were unable to produce any conclusive empirical evidence of causality in the relationships discovered. Given this limitation, the present study aims to elaborate on these findings by experimentally testing some of the associations revealed in the previous chapter – specifically those related to reconciling incompatible (or contextually stigmatised) identities in the self-concept.

In order to achieve this aim, we draw inspiration from research conducted by Jones and Jetten (2011). As outlined in Chapter 2, they found that asking people to indicate their membership in five different groups (versus three groups or one group) increased the length of time they could submerge their hand in ice water (i.e., a physically demanding task). On this basis, they concluded that the more groups to which people belonged, the more resilient they were in the face of physical challenges. The authors theorized that this effect was due to the buffering qualities of multiple

group membership – that is, the extent to which an individual can shield the self from any negative effects or strain associated with any one identity by drawing on the resources attached to other identities. Conceivably, this becomes relatively tricky for people who have only few group memberships to rely on as opposed to many (Cohen & Wills, 1985).

Jones and Jetten's (2011) study is noteworthy for being, to our knowledge, the only experimental research on the benefits of multiple group membership. However, as mentioned previously, the authors looked only at the sheer number of groups, and did not account for their individual or combined meaning within the self-concept, either for specific groups or for the multiple groups in combination with one another. Other correlational research, however, has indicated the negative repercussions for well-being of perceived identity compatibility (Brook et al., 2008; London et al., 2011; Rosenthal et al., 2011). Indeed, this is what we also found and reported in Chapter 3. In light of this, it seems germane to elaborate on these findings by investigating experimentally whether identity compatibility also impacts on the relationship between both well-being (as indicated by our previous studies) and psychological resilience (as indicated by Jones and Jetten, 2011). To this end, we designed an experiment that extended the paradigm developed by Jones and Jetten (2011).

Study 3

The present research comprised an online survey study comparing psychological well-being and resilience across three experimental conditions. These were defined by the number (one vs three) and compatibility (three compatible vs three incompatible) of the group memberships on which participants were asked to reflect prior to completing dependent resilience and well-being measures. In line with Jones and Jetten's (2011) conclusions, we predicted that contemplating

multiple identities (compared to a single identity) would facilitate greater resilience and well-being. However, we also predicted that this effect would only occur if the multiple identities were compatible with one another. If they were incompatible, the benefits of multiple identities were expected to disappear. Finally, based on our findings reported in the previous chapter, we hypothesized that these effects were mediated by social support, social inclusion, and identity expression, and accordingly also included measures of these variables.

Method

Participants

The research was conducted via an online survey at a large British university. The survey was advertised on the university participant recruitment website, SONA, and was accessible by undergraduate psychology students only. A sample of 211 students signed up and received course credit in return for their participation. Of the initial sample, 25 cases had missing data and were therefore excluded from the analyses. The final sample of 186 participants included 26 (14%) males and 160 (86%) females. The majority of these (91.8%, $n = 146$) were aged between 18 and 20 years old, but participant ages ranged from 18 to 43. A total of 13 different nationalities was included in the sample, with the majority of participants being from the UK, 88.2% ($n = 164$).

Study design and procedure

The online survey was programmed to randomly allocate participants to one of three experimental conditions, each designed to activate both specific identities and a particular number of identities. In Condition 1 ($n = 63$) participants reflected on a single identity, in Condition 2 ($n = 56$) they reflected on three compatible identities, and in Condition 3 ($n = 67$) they reflected on

three incompatible identities. The experiment consisted of four sections that all participants completed: *identity activation and importance*, *identity expression*, *resilience*, and *well-being*.

Participants in the multiple identity conditions (compatible and incompatible), however, completed an extra set of questions (*identity compatibility*) following the identity importance section.

Identity activation and importance. Participants were first asked a series of questions designed to activate a single or multiple identities, depending on the condition to which they were allocated. Specifically, in the single identity condition, participants were instructed to think of themselves in terms of one identity based on social category membership, randomized between either gender, study major [psychology], or nationality. In the other two conditions (compatible and incompatible), participants were asked to think of themselves in terms of three identities (gender, study major [psychology], and nationality). Participants were then asked to write a few sentences describing what it meant to them to belong to these categories, 'We would like to know more about what it means to belong to each of these groups. All groups in society have different qualities and characteristics. In a few sentences, please write down what it means to you to be [category]?' Finally, they were instructed to rate their agreement or disagreement with three statements (on 5-point Likert scales) designed to gauge the importance of each of the given identities to their self. These included, 'I feel close ties to other people of my [identity]', 'Being [identity] is important to me' and 'I am glad to be [identity]'.

Identity compatibility. In order to manipulate identity compatibility, we made slight changes to the instructions in the two multiple identity conditions. Specifically, the identity activation and importance section of the survey – where participants were asked to write down what it meant to them to belong to the given social categories – was framed slightly differently to create

compatibility or incompatibility between gender and study major identities. Specifically, the compatibility of gender and psychology study major was manipulated in these conditions by first highlighting the idea of gender differences in thought processes and ability and then enhancing stereotypically female and male qualities of what it means to be a psychologist (i.e. caring, understanding and helping tendencies vs. statistics driven and scientific discovery, respectively). This was done by adding a few extra sentences to the identity activation and importance instructions for gender and study major. In these two conditions, the text for gender was revised to include, ‘...All groups in society have different qualities and characteristics. Indeed, there are also differences between genders. For example, there is scientific evidence that men and women have different strengths, weaknesses and preferences when thinking about various things. In a few sentences, please write down why being female/male is important or unimportant to you.’ Following this, the instructions for the study major identity were revised to enhance either compatibility between being a woman and studying psychology and incompatibility between being a man and studying psychology: ‘...different areas of study cultivate different skills. For example, your field of study (psychology) focuses on understanding human behavior and helping and caring for those with psychological problems. In a few sentences, please write down why being in the field of psychology is important or unimportant to you’, or compatibility between being a man and studying psychology and incompatibility between being a woman and studying psychology: ‘...different areas of study cultivate different skills. For example, your field of study (psychology) is a statistics driven science that focuses on the biological and evolutionary bases of behavior. In a few sentences, please write down why being in the field of psychology is important or unimportant to you.’ Thus, men and women for whom compatible identities had been activated comprised the

compatible condition, while men and women for whom incompatible identities had been activated comprised the incompatible one.

Participants then rated the degree of perceived compatibility between each possible pairing (three) of the three identities (i.e., 'Thinking about [group X] and [group Y], how easy or difficult is it to belong to these two groups/social categories at the same time?') on 5-point Likert scales (1 = very difficult, 5 = very easy). The average compatibility score for all identity pairings was calculated to obtain an overall measure of identity compatibility and incompatibility.

Identity expression, social support and social inclusion. The next section of the survey comprised the questions used in Studies 1 and 2 to measure social support, inclusion and identity expression. Specifically, the measure of social support and social inclusion comprised three and two items, respectively, both measured on 5-point Likert scales. *Social support* (scale reliability $\alpha = .84$): 'To what extent do you feel that you have family or friends so close to you that you can count on them if you have serious problems?', 'How much concern/interest do people show in what you are doing?', 'How difficult would it be for you to get practical help from neighbors if you should need it?' And *social inclusion* (scale reliability $\alpha = .86$), 'Generally, I feel included by my peers in the community', 'Generally, I feel accepted by my peers in the community'. Next, identity expression was again measured with two items on 5-point Likert scales ranging from 1 (strongly disagree) to 5 (strongly agree), focusing on the person's perceived freedom to express their own identities, and the degree to which others saw them for 'who they really are' as a result of this expression ('In general, I feel free to fully express myself and my identity to the people around me', 'Other people don't see me the way I want to be seen' (reversed), and 'Sometimes I feel like other people are trying to put me in a box that doesn't fit' (reversed); scale reliability $\alpha = .74$).

Resilience. Psychological resilience was measured using the Brief Resilience Scale (BRS) (Smith et al., 2008) which assesses resilience to stress and adversity in life in general. This instrument asks participants to indicate on 5-point Likert scales how true (1 = not at all true, 5 = very true) each of six statements are in describing their resilience (e.g. 'I tend to bounce back quickly after hard times', 'I have a hard time making it through stressful events', etc.) (scale reliability $\alpha = .85$).

Well-being measures. Psychological well-being was assessed with the 11-item General Well-being index (GWBI) (Hopton et al., 1995) from Studies 1 and 2.

Results

Analytic strategy

Data analysis was conducted in two steps. First, descriptive statistics (means, SDs) were generated for each variable to provide a general overview of participant responses and variable relationships. Next, guided by the study hypotheses, analyses of variance were conducted to ascertain any effects on the outcome variables between conditions. Of primary interest were the hypothesized effects of number of activated identities and identity compatibility on resilience and well-being. Given the mediating properties of social support, identity expression, and social inclusion determined in the previous chapter, we also tested in this study whether any resilience or well-being effects of condition were mediated by these variables. For the latter analyses, we used Hayes and Preacher's (Hayes & Preacher, 2014) method for mediation analysis with a multi-categorical independent variable.

Descriptive findings

Relative to the scale midpoint of three, overall, participants perceived the activated identities as considerably high in identity compatibility ($t(122) = 10.32, p < .001$), identity importance ($t(185) = 22.93, p < .001$), and identity expression ($t(185) = 9.81, p < .001$) (see Table 4.1). Thus, on average participants felt that the identities on which they reflected fit well together, were relatively easy to express and communicate to others, and featured prominently in their overall self-concept.

Participants further reported relatively high levels of social support ($t(185) = 22.52, p < .001$) and social inclusion ($t(185) = 20.64, p < .001$) as well as resilience ($t(185) = 1.83, p = .07$) and well-being ($t(185) = 15.10, p < .001$) (see Table 4.1). That is, participants generally felt that they were part of a considerably strong social network through which they could access support when needed. They also were relatively happy and well, and felt able to cope with most stress and hardship.

To check whether our identity compatibility manipulation had been successful, we ran an independent samples t -test comparing identity compatibility scores for participants in the compatible and incompatible conditions. As expected, participants in the compatible condition perceived greater compatibility between their gender and study major (psychology) than people in the incompatible condition, $m^{\text{dif}} = .36, t(121) = 2.33, p = .02, 95\% \text{ CI } [.05, .66]$.

Table 4.1 Means and SDs for identity and well-being measures.

Variable	Mean (SD)
Identity compatibility	3.80 (0.87)*
Identity importance	4.00 (0.59)*
Identity expression	3.63 (0.88)*
Social inclusion	4.20 (0.80)*
Social support	4.18 (0.78)*
Resilience	3.11 (0.80)†
Well-being	3.71 (0.64)*

† $p < .07$, * $p < .01$. Significance values based on difference from scale midpoints (3).

Analyses of variance

The between-condition mean scores and standard deviations on each outcome variable are presented in Table 4.2. To ascertain any differences between conditions, a 2 (identity number) x 3 (condition) between-participants analysis of variance was performed. Our experimental manipulation was designed primarily for women, and involved changing the meaning of gender relative to study major (psychology). However, as described above, we accepted male participants as well under the assumption that they would also be susceptible to the compatibility manipulation. To be sure that this was the case and that there were no between gender effects, we controlled for gender in the following analyses. We found an effect for condition on social support, $F(2, 185) = 3.54$, $p = .03$, $\eta_p^2 = .03$. Post-hoc tests revealed that people in the compatible condition perceived greater access to social support than people in the incompatible condition, $m^{\text{dif}} = .34$, $p = .01$, 95% CI [.08, .59]. There were no differences between people focusing on a single identity and people focusing on multiple identities¹. Thus, it would seem that multiple identities must be compatible to unlock their benefits in terms of social support. Although the same pattern was evident on all the remaining dependent variables, the effect of condition did not reach significance in any other case, ($F_s(2, 185) < 1.32$, $p_s > .05$).

¹ There were no effects between the specific identities activated in condition 1 (i.e. one of three possible rotated)

Table 4.2 Means and standard deviations on each outcome variable by condition.

	Condition 1 single identity (<i>n</i> = 63)	Condition 2 compatible identities (<i>n</i> = 56)	Condition 3 incompatible identities (<i>n</i> = 67)
	<i>m</i> (<i>sd</i>)	<i>m</i> (<i>sd</i>)	<i>m</i> (<i>sd</i>)
Social support	4.21 (.66)	4.35 (.57)	4.01 (.84)
Social inclusion	4.24 (.75)	4.29 (.76)	4.07 (.85)
Identity expression	3.67 (.81)	3.77 (.85)	3.48 (.95)
Resilience	3.21 (.77)	3.14 (.83)	3.07 (.82)
Well-being	3.76 (.63)	3.75 (.63)	3.62 (.65)

Mediation analysis

Despite the absence of any effects of the independent variables on the key dependent variables (resilience and well-being), we nonetheless explored the potentially mediating effects of social inclusion, social support, and identity expression. As noted in Chapter 3, previous research justifies testing for mediation in the absence of a direct effect (Hayes, 2009; 2013; Hayes & Preacher, 2014). We used Hayes and Preacher's (2014) method for mediation analysis (PROCESS Model 4) with a multi-categorical independent variable. Thus, we contrast coded our independent variable by each of its three levels: single identity, multiple compatible identities and multiple incompatible identities. We rotated conditions to analyze each possible pairing of our three conditions in this fashion. Following Hayes and Preacher's (2014) recommendation, we transformed the contrast codes such that the largest and smallest code in a set differed by no more than a single unit, thus facilitating interpretability of results by placing all effects on a mean difference metric. Further, similar to the analyses of variance reported above, we controlled for gender importance.

Exploring any indirect effects on well-being, we compared the compatible condition and the incompatible condition, controlling for the single identity condition. This resulted in significant effects of condition on identity expression and social support with both of these variables mediating

the effect on well-being. Specifically, relative to people focusing on multiple incompatible identities, people reflecting on multiple compatible identities reported more social support and freedom of self-expression by an average of .11 ($B = .33$, $SE = .12$, $t(182) = 2.63$, $p < .001$) and .10 units ($B = .28$, $SE = .15$, $t(182) = 1.80$, $p = .07$), respectively. In turn, these effects translated into greater well-being by .01 unit via social support (95% CI [.02, .20]) and .10 unit via identity expression (95% CI [.00, .15]).

Further, contrasting the single identity condition with the compatible condition we found another indirect effect on well-being via social support. Here, people focusing on multiple compatible identities reported .14 units more social support than people reflecting on a single identity ($B = 1.05$, $SE = .43$, $t(182) = 2.43$, $p = .02$). This mediated increased well-being in this group by .03 units (95% CI [.06, .61]). Finally, contrasting the single identity condition with the incompatible condition, we found that the number of activated identities impacted on well-being via social support. While those individuals focusing on a single identity reported .10 units more social support than those with multiple incompatible identities activated, this difference was not statistically significant ($B = .39$, $SE = .25$, $t(182) = 1.55$, $p = .12$). On average, however, those reflecting on a single identity reported .10 units higher well-being than those individuals focusing on multiple incompatible identities ($B = 1.04$, $SE = .43$, $t(182) = 2.43$, $p = .02$). This effect was mediated by social support (95% CI [.00, .26]) (see Table 4.3).

Rerunning these analyses with resilience as the main outcome variable, we found that the .10 unit difference in freedom of self-expression ($B = .28$, $SE = .15$, $t(182) = 1.80$, $p = .07$) in favor of individuals focusing on multiple compatible identities relative to those focusing on multiple incompatible identities, mediated resilience. Specifically, reflecting on compatible compared to

incompatible identities caused an average .10 unit increase in resilience via identity expression (95% CI [.00, .17]) (see Table 4.3). There were no other significant effects on resilience, and nor were there any significant effects associated with social inclusion as a mediator or outcome variable.

Thus, it would seem that those participants reflecting on multiple compatible identities were better off than those focusing on a single identity (in terms of well-being) or multiple incompatible identities (in terms of well-being and resilience), and that individuals focusing on a single identity were better off (in terms of well-being) than those focusing on multiple incompatible identities. Moreover, dovetailing with the previous chapter, there was evidence that perceived social support and identity expression mediated these well-being and resilience effects.

Table 4.3 Indirect contrast effects on well-being and resilience via mediators.

Contrast	Mediator	Outcome variable	Effect (unit difference)	Coeff.	Boot SE	Boot CI (95%) low	Boot CI (95%) high
Compatible vs. incompatible	Id. Expression	Resilience	.10*	.07	.04	.00	.17
	Id. Expression	Well-being	.10*	.06	.04	.00	.15
	Social support	Well-being	.01*	.08	.04	.02	.19
Single vs. compatible	Social support	Well-being	.03*	.27	.14	.06	.61
Single vs. incompatible	Social support	Well-being	.10*	.10	.07	.00	.26

*Note: 10000 bootstrap samples, *significant at $p < .05$.*

Discussion

We hypothesized that multiple group memberships would facilitate greater well-being and resilience than a single group membership, but only when multiple groups were compatible in nature. We also expected these effects to be mediated by social support, social inclusion, and identity expression. While our results indicate only a single direct effect of condition on social support, they still provide some support for these expectations. Participants reflecting on multiple compatible identities felt more free to self-express and perceived more social support than people

with multiple incompatible identities activated. In turn, this translated into greater well-being and – in terms of identity expression – greater resilience. Similarly, those individuals with a single identity activated perceived less social support and experienced lower well-being than those with multiple compatible identities activated, but more social support and greater well-being than individuals with multiple incompatible identities activated. Contrary to our hypotheses, however, social inclusion did not factor as a mediator. Overall, our results are at least partially consistent with Jones and Jetten's (2011) conclusion that multiple group membership facilitates well-being and resilience. However, our results also elaborate on these findings by demonstrating that this relationship is contingent on the socially defined content of those group memberships and their combination in the self-concept. Indeed, our results indicate that in some circumstances self-definitions comprising a single identity are more beneficial in terms of well-being than self-definitions made up of multiple incompatible identities. Thus, the relationship between multiple group membership and well-being is not determined solely by the sheer number of group memberships, but also by their compatibility. We further support our findings reported in the previous chapter by demonstrating the mediating effects of identity expression and social support.

The moderating role of identity compatibility in the context of the well-being effects of multiple group membership makes sense in light of Brook and colleagues' (2008) previous findings (discussed in Chapters 2 and 3). That is, where participants in our study presumably experienced an unproblematic sense of purpose and suitability in the field of psychology when it was framed as compatible with their gender, they likewise may have felt out of place, conflicted and questioned the legitimacy of their membership in the psychology category when this was presented as conflicting with their gender stereotype. In line with this example and with previous research, membership in one category may complicate membership in others if their respective content

matters conflict, and this may decrease well-being (Brook et al., 2008; Iyer et al., 2009; Jaspal & Cinnirella, 2010). Further, the buffering qualities of multiple group memberships may be undermined if these memberships are not, in fact, supportive of one another, leaving the self-concept vulnerable.

While these findings are interesting and add novel insight into the relationship between multiple group membership and well-being, there are nonetheless a few important limitations. First of all, while our results indicate social support and identity expression as central mediators of the effects of single versus multiple and compatible versus incompatible group memberships, these mediators were not consistent across conditions. That is, social support mediated well-being in each condition, but not resilience, whereas identity expression mediated well-being *and* resilience, but only for the comparison between multiple compatible and incompatible groups. Social inclusion did not mediate well-being or resilience at all (Table 4.3). Considering the direction of the results – which is largely consistent across conditions and mediator variables (see Table 4.2) – these issues may be to do with the relatively small sample size on which our results are based. That is, a larger sample may have brought out effects more consistently across conditions and outcomes.

Further, to the extent that our results elaborate on those achieved by Jones and Jetten (2011), our conclusions are based on somewhat different outcome variables. Where we focused on the effect of multiple group memberships on the individual's self-reported, broad-spectrum feelings of well-being and resilience in life, Jones and Jetten (2011) accessed these potential benefits in more immediate terms of resilience against taxing physical activity. In doing so, they were able to demonstrate the mental benefits of multiple group memberships and more specifically how these may manifest in a very physical capacity (i.e., in coping with corporeal strain). However, as

mentioned above, the main shortcoming to their studies relates to their theoretical conceptualization of the benefits of multiple group memberships as driven primarily by their number, ignoring their specific features and content. Thus, in the next chapter, we elaborate on these present and past findings in two central ways: First, we use more refined psychophysiological outcome measures to better tap the specific contribution of multiple group memberships to mental resilience against experienced stress. Second, we do this while also accounting for not only the number of those groups, but the compatibility of the associated identities as well.

Chapter 5

Challenge, accepted: The effect of multiple identities on physiological threat versus challenge responses to mental stress

Even under the best circumstances, everyday life entails experiences that are both physically and psychologically demanding and potentially stressful. Whether it is speaking in public, navigating peak hour traffic, or working in high-pressure jobs, people approach and deal with stressors in various ways and with different outcomes. Some people shrink and freeze in the face of adversity whereas others rise to the occasion and thrive under pressure. The individual resources that facilitate or undermine resilience are numerous, and may include both physical, psychological, and social factors (J. M. Jones & Jetten, 2011; R. M. Lee, 2005). In the previous chapter, we presented experimental survey-based evidence, indicating that multiple compatible identities increased well-being and (to a lesser extent) resilience, whereas multiple incompatible identities undermined these benefits. Building on these findings, we now look at multiple group membership as one potential source of mental strength and resilience in the face of psychological stressors. However, rather than using self-report outcome measures that ask relatively general questions about resilience, we incorporate a more practical assessment of this by measuring physiological reactions to experiencing stress. Specifically, we aim to dig deeper into the consequences of multiple group memberships for resilience by focusing on physiological indicators, such as those based on impedance cardiography (ICG), electrocardiography (ECG), and blood pressure (BP). These measures have been reported as being less error prone and more objective and precise than self-report and explicit behavioral measures that we used in our previous studies, and which tend to be

used generally in research on resilience (Blascovich & Mendes, 2010; Blascovich, Vanman, Mendes, & Dickerson, 2011).

Although past research has used physiological indicators of coping and resilience (e.g., heart rate recovery, endurance in a painful task) (J. M. Jones & Jetten, 2011), these measures are relatively coarse. The broader literature on psychophysiology suggests paradigms and measures that can be used to index stress-related states with reasonable reliability (e.g., Blascovich, 2008; Blascovich et al., 2011; Scheepers, 2008). In our studies, we exposed participants to a mental stressor and used measurements of respiratory sinus arrhythmia (RSA), cardiac output (CO), pre-ejection period (PEP), and total peripheral resistance (TPR) before, during and after exposure as our main dependent variables. As measures of sympathetic and parasympathetic control (which together make up the autonomic nervous system which regulates the fight or flight response), these biological reactions have been employed previously as general indicators of motivation and stress, and have been used with high reliability to differentiate between critical stress-related responses of *challenge* (i.e., a fight response) versus *threat* (i.e., a flight response) (Blascovich et al., 2011). Specifically, past research has attributed shorter PEP², decreased TPR, and greater CO to the perception of having more resources at one's disposal relative to how difficult a task or situation is perceived (challenge). By contrast, when the demands of a given situation are deemed as greater than the available resources at hand (threat), CO decreases and TPR increase (Mendes, Major, McCoy, & Blascovich, 2008; Tomaka, Blascovich, Kelsey, & Leitten, 1993). Similarly, high RSA (or high frequency heart rate variability) has been used as an index of calmness and lack of distress as well as with general responsiveness to and engagement with a given environment (Blascovich et al.,

² Recently, research has found PEP to be a better indicator of task engagement than challenge per se, and thus often do not report this variable as a marker of challenge (Blascovich et al., 2012). In spite of this, we chose to retain PEP as an supplementary outcome variable *as well as* an indicator of task engagement.

2011; Porges, 2007). Low RSA, on the other hand, has been linked to the experience of increased stress (Croizet et al., 2004; Tattersall & Hockey, 1995).

Thus, consistent with our findings reported in the previous chapter, as well as those in the past resilience literature (Jones & Jetten, 2011), we argue that multiple and compatible group memberships should constitute a source of strength and stamina that contribute to an individual's ability to adapt and deal with stressful life events and challenges. The more groups to which a person belongs, the more likely he or she is to perceive a stressful event as a surmountable challenge rather than an overwhelming threat. However, this effect of multiple group memberships should only hold when the groups that are active within the self-concept are perceived to be compatible with one another. Belonging to, or thinking about the self in terms of, incompatible groups may undermine the benefits associated with multiple group membership, and render the individual more likely to perceive a stressful event as an overpowering threat rather than a challenge. We conducted two experimental studies testing these ideas.

Study 4

Study 4 compared resilience to stress across three conditions defined by the number of group memberships participants were asked to reflect on (one, three, or five; following Jones & Jetten, 2011). The number of identities salient in each condition was manipulated before presenting participants with a stressful task (completing practically unsolvable mental puzzles and preparing a speech) while having their physiological reactivity continuously measured. Identity importance as well as participant affect after testing were also measured as control variables. We anticipated that participants' physiological reactivity would be consistent with markers of challenge or threat depending on the number of activated identities (Blascovich, 2011). Specifically, we

expected that the more identities on which participants reflected, the more psychological capital they would perceive to be at their disposal to cope with any stress experienced. Thus, as participants considered themselves in terms of more rather than fewer identities, the shorter their PEP and the lower their TPR would be in reaction to the stressor. Similarly, their CO would be greater. In terms of RSA as a marker of perceived stress, we believed that this would increase in response to the stressor, indicating calm and focus. Finally, we predicted that recovery to baseline physiological reactivity would be quicker for participants with more identities salient. Together, these responses would index a state of challenge (rather than threat) in the face of the stressor for participants with more (rather than fewer) identities activated. Thus, we designed Study 4 as an initial baseline study focusing on the effects of number of salient identities on individual resilience to stress, excluding explicit manipulation of identity compatibility.

Method

Participants

The study was advertised on the research recruitment website for first-year psychology students at a large British university. In response to the advertisement, 94 female psychology students signed up for participation. Of these, 16 were not included in the study for one or more of the following reasons: (i) the participant did not show up, (ii) the participant felt uncomfortable with the physiological equipment and withdrew from the experiment, (iii) the physiological equipment malfunctioned, (iv) disruptions occurred during testing, compromising the veracity of the physiological data (e.g. external noise, people entering the laboratory, etc.). Thus, the final sample comprised 78 first-year female psychology students. Although recruitment was not guided

by explicit power calculations, the overall sample size and the individual cell sizes were considerably larger than those used by Jones and Jetten (2011; Study 2 $N = 56$), on which the present experiments were based. All of the participants were between 19 and 25 years of age, with the majority identifying as British (British = 75.4%, Other European = 20.5%, South-East Asian = 3.9%). Participants received course credit in return for their participation.

Laboratory setting

The study took place at a large British university laboratory that consisted of a reception room and a testing room. In the testing room, the (male) researcher applied the physiological measurement equipment to participants. Throughout the study, participants were seated in a comfortable office chair in front of the computer used for the questionnaire administration. During testing, the researcher remained in the adjoining room where he could observe participant progress on a monitor connected to the computer in the testing room. In case of any equipment malfunction or participant unease during testing, participants could ring a bell at any time to get the attention of the researcher.

Cardiovascular data collection and outcome measures

Cardiovascular data was recorded non-invasively and by following commonly accepted guidelines (Blascovich et al., 2011). Specifically, continuous impedance cardiography (ICG), electrocardiography (ECG) and blood pressure (BP) measurements were taken. To this end, the state-of-the-art MP150 data acquisition Biopac system was utilized for ICG and ECG data collection. To measure BP, we used a non-invasive blood pressure amplifier (NIBP model 100D). This involved an arm cuff placed around the upper arm and finger cuffs on the middle and index fingers. Both finger and arm cuffs were applied to the participant's non-dominant arm and hand. For ICG

measurement, a common four spot electrode configuration was employed to record basal thoracic impedance (Z) and its first derivative (dZ/dt ; i.e. the change in basal impedance (z) over time (t)). This configuration required two electrodes at the base of the neck, vertically three centimeters apart. Measuring 30cm down from the lower of these two electrodes, another two were placed on the lower back, also vertically three centimeters apart (Wit, Scheepers, & Jehn, 2012). For ECG measurement, a modified Lead II configuration (Blascovich et al., 2011) was used, placing the upper spot electrode immediately above the sternum and the lower spot electrode on the left side below the ribcage. Together, the three measures of ICG, ECG and blood pressure afforded the calculation of the four main physiological outcome variables for this study: (i) *cardiac output* (CO), (ii) *pre-ejection period* (PEP), (iii) *total peripheral resistance* (TPR), and (iv) *respiratory sinus arrhythmia* (RSA)³.

Quantification of physiological data

We used AcqKnowledge software to score the physiological data. We examined ICG, ECG, and blood pressure data visually at first. If there were any artefacts or too much noise in the data to be filtered out and scored consistently and reliably (e.g., due to participant movement or equipment malfunction during testing), the data was discarded. This was the case for two participant datasets. Representative waveforms for each phase of the experiment (i.e., the five baselines) were selected manually and scored using standard AcqKnowledge menu functions. The output was then visually examined again to ensure the accuracy of the automatic scoring of inflections (i.e., changes in direction or slope) of the ECG and ICG waves. Specifically, an ECG recording consists of five such

³ While past research suggests the need to control for respiration when measuring RSA, the most recent review on quantification of RSA (Denver, Reed, & Porges, 2008) found that there is no relation between spontaneous respiration frequency and RSA amplitude, and that respiration frequency can be precisely scored by RSA frequency. As participants in our study breathed spontaneously and in a resting position (seated), we chose not to measure respiration rate or depth directly.

waves: P, Q, R, S and T waves. Each wave signifies a different point in the depolarization and repolarization of the heart ventricles in response to electrical impulses. The combination of these points in time allows for the calculation of a complete heart period (or interbeat interval). Similarly, ICG represents a measure of change in blood flow in the heart. B, Z, and X waves indicate how much blood is ejected during each cardiac cycle as well as the opening and closing of the aortic valves. Scoring the data in these terms (ECG and ICG) allows for the calculation of CO, RSA, PEP, and TPR (Blascovich et al., 2011).

Study design and procedure

Following the paradigm developed by Jones and Jetten (2011), participants in Study 4 were randomly allocated to one of three conditions. Each condition went through the same procedure, which included a computer questionnaire designed to activate a particular number of identities in participants, as well as three mind puzzles and a speech preparation task intended to induce stress. Specifically, in Condition 1 ($n = 25$) participants were asked to categorize themselves in terms of a single identity based on social category membership (randomized between gender, study major, nationality, age and occupation). In Condition 2 ($n = 26$), participants categorized themselves in terms of three identities (again randomized between the five identities), and in Condition 3 ($n = 27$) all five identities were activated.

Once participants arrived at the laboratory they were asked to take a seat in the testing room where they read a plain language statement and signed their consent to participate. Afterwards, the researcher briefly and in very general terms described the experiment and what the participant would be required to do. The true nature of the study focus was not revealed to the participant, nor was there any specific mention of the puzzles or the speech task. The study was instead described

as an ‘...overall simple questionnaire study involving a few easy tasks’. Following this, the researcher applied the physiological equipment to the participant and loaded the questionnaire program before leaving the testing room to observe participant progress on the computer monitor in the adjoining room.

The study consisted of five phases. First, participants were instructed to sit still and do nothing for five minutes. This was done to accustom participants to the physiological equipment and establish an initial physiological baseline for the measurements. The last minute of this phase was marked *Baseline 1*. Once the five minutes were up, the second phase automatically started and instructions and questions designed to activate participant identity/identities appeared on the screen. This involved participants categorizing themselves in terms of one, three or five social categories depending on the condition to which they were allocated. Following Jones and Jetten (2011), after indicating their group membership (e.g., male or female) participants were asked to write down on a piece of paper what it meant to them to belong to this category. Finally, they were instructed to rate their agreement or disagreement on 7-point Likert scales with three statements designed to gauge the importance of the identity to their self. These included, ‘*I feel close ties to other people of my [identity]*’, ‘*Being [identity] is important to me*’ and ‘*I am glad to be [identity]*’. Participants in the first condition did this only once, participants in the other conditions completed this three or five times for each of the activated identities (all reliability $\alpha > .74$). The last minute of this phase was titled *identity activation* and was included to measure and control for any arousal during identity activation.

The third phase comprised the inducement of stress. Specifically, participants were informed that they would be presented with three simple mind puzzles, appearing on the screen one at a

time. They had two minutes to solve each puzzle before the next one appeared on screen. Participants were also told that after solving the puzzles, they would be required to give a speech on camera explaining the reasoning they had employed in coming up with the solutions. Unknown to the participants, the puzzles were deliberately extremely hard and nearly impossible to solve in the two-minute timeframe. Indeed, only three participants managed to solve a single puzzle in the time given. Furthermore, the speech task was also fictitious. Once the time for the last puzzle was up, a message appeared on screen instructing participants to gather their thoughts and prepare to give their oral presentation to the experimenter who would be in shortly with a camera to record their speech for viewing and subsequent evaluation. From the time that this instruction appeared on screen, the experimenter waited 30 seconds before entering the room to give the participant a bogus explanation as to why they did not have to do the speech after all (camera malfunction). This was the end of the third phase. The last minute of this phase was presumed to be the most stressful since at this point participants would in all likelihood not have solved any of the puzzles and believed that they would soon have to give a speech on camera explaining solutions (which they did not have) for the supposedly easy puzzles. Hence, this period was titled *peak stress*. For the final phase, participants were instructed to sit still and relax for five minutes after which testing would be over. The first and last minute of this phase were titled *post-stress* (as immediately prior to this point participants had been told that they did not have to do the speech after all and that all they had to do now was rest) and *baseline 5*, respectively.

Once testing was over, the experimenter entered the testing room to unhook the participant from the physiological equipment. The participant was then asked to fill out a task evaluation questionnaire, assessing the participant's mood and affect, perception of task difficulty, stress levels, as well as measures of perceived identity compatibility of the social categories with which

the participant had identified. Specifically, participants were presented with four items, asking them to rate on 5-point Likert scales the extent to which the puzzles and speech preparation were easy or difficult, enjoyable, stressful, and challenging. They were then presented with another five single-item measures, with the instruction to rate on 5-point Likert scales how frustrated, motivated, exhausted, happy, and sad they felt. Finally, participants were asked to think of the social categories referred to during testing, and consider how these fit together in terms of compatibility. Thus, they were instructed to rate on 7-point Likert scales the perceived extent of compatibility between each possible pairing of the social categories activated in the study (compatibility: 'Thinking about your gender and your study major, how well do these two groups/categories fit together?' 1 = not well at all, 7 = very well). The measure of compatibility was included to account for any moderating effects of identity compatibility on well-being and resilience (Brook et al., 2008; Roccas & Brewer, 2002; Sønderslund, Morton, & Ryan, Under review). These sections of the evaluation questionnaire only applied to Conditions 2 and 3 as Condition 1 involved activation of a single identity and therefore questions about compatibility were not relevant.

Results

Analytic strategy

Data analysis was conducted in four steps. First, descriptive statistics for participant responses to the evaluation questionnaire were calculated (see Tables 5.1 and 5.2 for means and SDs). Further, the averages for the main outcome variables (CO, TPR, PEP, and RSA) were calculated for each of the five baselines (Table 5.3). Second, to be able to interpret some of our findings (CO and TPR) in terms of the threat vs. challenge paradigm, we first needed to verify that participants were

indeed motivated by and engaged with the task of solving the puzzles (Blascovich et al., 2010). To this end, we calculated a reactivity difference score for heart rate and PEP by subtracting baseline reactivity scores from those measured during the stressor. We then tested whether this score was different to zero. A significant difference in either heart rate or PEP (preferably both) would indicate engagement with the task (Blascovich et al., 2010). Third, as recommended by Blascovich et al. (2010), we analysed reactivity and recovery (first baseline subtracted from the last) scores to ascertain between and within condition differences on all of the main outcome variables. As recommended by Blascovich, Seery, Mugridge, Norris, & Weisbuch (2004), we also created a threat and challenge index by combining the main threat and challenge indicators, CO and TPR. Finally, guided by the hypotheses for the study, we supplemented the reactivity scores analyses by exploring the data further using repeated measures analyses. Of primary interest was the hypothesized relationship between condition (number of identities activated) and cardiovascular responses to stress.

Descriptive findings

Participants rated the puzzles and the speech preparation task significantly below the scale midpoint (3.00) for *easiness* ($t(78) = -4.18, p < .001$), and significantly above the scale midpoint for the degree to which it was *challenging* ($t(78) = 9.34, p < .001$) (see Table 5.1). However, any *frustration* and *exhaustion* experienced during and after the task was generally low with both of these rated below the scale midpoint ($t(78) = 1.96, p < .001$ and $t(78) = -6.30, p < .001$, respectively). Similarly, participants were relatively happy post testing (*Happy*: $t(78) = 5.79, p < .001$; *Sad*: $t(78) = -19.35, p < .001$) (see Table 5.1). Thus, participants felt that the tasks were relatively difficult to manage and solve, although this did not appear to negatively affect their emotional state post-testing.

Participants perceived the identities in which they were categorized as relatively high in *identity compatibility* ($t(52) = 18.61, p < .001$) and *identity importance* ($t(78) = 26.98, p < .001$) (see Table 5.1). Thus, participants felt that the activated identities fit well together and featured prominently in their overall self-concept. There were no significant differences between conditions for any of the evaluation questionnaire variables, $F_s(2, 73) < 1.16, p_s > .32$.

Table 5.1 Identity centrality and evaluation questionnaire means and SDs.

Variable	Mean (SD)
Easy	2.51 (1.04)*
Enjoyable	2.96 (0.97)
Challenging	3.91 (0.87)*
Stressful	3.21 (1.16)
Frustrated	1.96 (1.05)*
Motivated	2.84 (0.95)
Exhausted	2.25 (1.07)*
Happy	3.53 (0.81)*
Sad	1.50 (0.69)*
Identity compatibility	4.47 (0.58)*
Identity importance	5.48 (0.82)*

* $p < .05$, ** $p < .01$. All scale midpoints = 3, except for *Identity centrality* = 4.

Table 5.2 Mean physiological output for each experimental phase

	Condition	Baseline phase mean (SD)				
		1 Rest	2 Id activation	3 Stress peak	4 Stress relief	5 Rest
(beat/min)	1	85.44 (2.62)	90.21 (2.58)	93.04 (3.17)	86.45 (2.40)	85.63 (2.89)
	2	78.49 (2.60)	83.00 (2.53)	80.73 (3.11)	77.37 (2.35)	78.81 (2.83)
	3	83.65 (2.52)	89.02 (2.48)	90.86 (3.05)	84.05 (2.31)	84.58 (2.77)
	M	82.49 (13.28)	87.17 (13.20)	88.23 (16.73)	82.56 (12.52)	83.06 (14.4)
(L/min)	1	5.16 (0.29)	5.26 (0.30)	5.63 (0.30)	5.55 (0.35)	5.56 (0.39)
	2	4.00 (0.29)	4.28 (0.30)	4.04 (0.30)	4.07 (0.35)	3.84 (0.39)
	3	4.65 (0.28)	4.89 (0.29)	5.00 (0.29)	5.20 (0.34)	5.00 (0.38)
	M	4.63 (1.50)	4.84 (1.54)	5.04 (1.86)	5.02 (1.86)	4.88 (2.13)
3P (mmHg)	1	102.31 (2.52)	101.75 (2.95)	101.50 (3.47)	99.46 (3.47)	100.44 (3.15)
	2	102.00 (2.47)	104.69 (2.90)	100.75 (3.29)	97.94 (3.40)	100.38 (3.09)
	3	102.45 (2.43)	105.86 (2.84)	103.09 (3.23)	101.80 (3.34)	102.56 (3.03)
	M	102.31 (12.34)	103.89 (14.77)	101.72 (16.46)	99.95 (16.46)	101.13 (15.4)
R (dynes, sec/cm ⁻⁵ /m ²)	1	1984.54 (185.87)	1958.80 (179.94)	1982.13 (202.75)	2333.53 (234.52)	2306.16 (216.1)
	2	2120.71 (182.26)	2134.30 (176.94)	2162.25 (202.75)	2050.93 (234.52)	2344.67 (216.1)
	3	2140.71 (182.26)	2120.06 (173.50)	1914.04 (198.81)	1850.21 (229.97)	2003.40 (212.1)
	M	2115.60 (924.14)	2056.96 (876.60)	1984.80 (1002.20)	2053.31 (1160.26)	2108.66 (1083)
P (seconds)	1	0.11 (0.00)	0.13 (0.01)	0.12 (0.01)	0.12 (0.01)	0.13 (0.01)
	2	0.11 (0.00)	0.12 (0.01)	0.12 (0.01)	0.12 (0.01)	0.12 (0.01)
	3	0.11 (0.00)	0.12 (0.01)	0.10 (0.01)	0.10 (0.01)	0.11 (0.01)
	M	0.11 (0.02)	0.12 (0.04)	0.11 (0.04)	0.12 (0.04)	0.12 (0.03)
A	1	0.0001 (0.0013)	0.0001 (0.0002)	0.0001 (0.0003)	0.0003 (0.0006)	0.0001 (0.0001)
	2	0.0001 (0.0008)	0.0001 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0001)
	3	0.0001 (0.0010)	0.0001 (0.0002)	0.0001 (0.0002)	0.0001 (0.0000)	0.0001 (0.0001)
	M	0.0001 (0.0011)	0.0001 (0.0002)	0.0001 (0.0002)	0.0002 (0.0003)	0.0002 (0.0001)

Task engagement assessment

Our task engagement analysis – as described above – revealed no change in PEP in the study population, $m^{dif} = .00$, $t(79) = .87$, $p = .39$. However, participants did react to the stressor with a significant increase in heart rate ($m^{dif} = 5.75$, $t(79) = 4.70$, $p < .001$). Thus, while it may have been ideal to record both an increase in HR and a decrease in PEP to indicate task engagement, based on the significant increase in HR alone, we can still assume that participants were engaged during the stressor, and therefore interpret our findings (PEP, CO, TPR) in terms of threat and challenge (Blascovich et al., 2010).

Reactivity analysis

For the purposes of the following analyses, we focused on phase 1 (Rest), phase 3 (Stress peak), and phase 5 (Rest). To ascertain any differences between conditions in terms of reactivity in response to the stressor (phase 3) and recovery (phase 5), multivariate analyses of variance were performed on the four primary outcome variables, *cardiac output* (CO), *total peripheral resistance* (TPR), *pre-ejection period* (PEP), and *respiratory sinus arrhythmia* (RSA). We also computed a threat/challenge index (TCI) of CO and TPR and inserted this variable as a single indicator of threat and challenge. To test for differences in physiological reactivity between the three relevant phases within each condition, we conducted one-sample t-tests, comparing the change in arousal between the initial baseline (test value = 0) and both the stressor and the final baseline.

Reactivity analysis results

Threat/Challenge Index (TCI): As noted above, we computed a threat and challenge index (TCI) for CO and TPR scores (which are the main indicators of threat and challenge). Specifically, we generated standardized scores for both variables, then reversed the TPR values so that increases in both CO and TPR indicated challenge orientation and decreases indicate threat perception, and then finally combined the two into a single variable, $TCI (-1 * z\Delta TPR) + (1 * z\Delta CO)$. We ran a one-way analysis of variance on this variable to ascertain any between condition differences. We found no statistically significant results ($F(2, 79) = 1.05, p = .36, \eta_p^2 = .03$).

Cardiac Output (CO): We found a marginally significant effect of condition on CO reactivity ($F(2, 74) = 3.57, p = .07, \eta_p^2 = .07$). Bonferroni post hoc tests revealed that this was due to a marginal difference in CO stressor reactivity between condition 1 (single identity) and condition 2 (three identities). Specifically, people reflecting on a single identity experienced marginally greater CO during the stressor than people focusing on three identities ($m^{\text{dif}} = .77, p = .07, 95\% \text{ CI } [-.04, 1.57]$).

Probing further, we tested the hypotheses directly by looking at reactivity scores in response to the stressor and during recovery within each condition. Thus, we compared reactivity and recovery scores to the initial baseline. People in condition 2 and 3, recorded no significantly different scores during the stressor compared to baseline ($m^{\text{dif}} = .05, t(25) = -1.72, p = .10, 95\% \text{ CI } [-.52, .05]$; $m^{\text{dif}} = .11, t(25) = .58, p = .57, 95\% \text{ CI } [-.28, .50]$, respectively). People in condition 1, however, increased marginally significantly in CO during the stressor ($m^{\text{dif}} = .55, t(25) = 1.79, p = .09, 95\% \text{ CI } [-.08, 1.18]$) and then recovered to their initial baseline ($m^{\text{dif}} = -.37, t(25) = -.95, p = .35, 95\% \text{ CI } [-1.19, .43]$) (see Figure 5.1).

Thus, the total pattern across analyses of participant CO indicates that people with a single identity activated (condition 1) experienced higher CO during the stressor than people with three identities activated, suggesting greater challenge orientation in the former condition. Further, within condition, people with a single identity activated also responded to the stressor in a manner consistent with challenge orientation (i.e. marginally greater CO) before returning to baseline. Neither of the other conditions responded to the stressor in any statistically significant way.

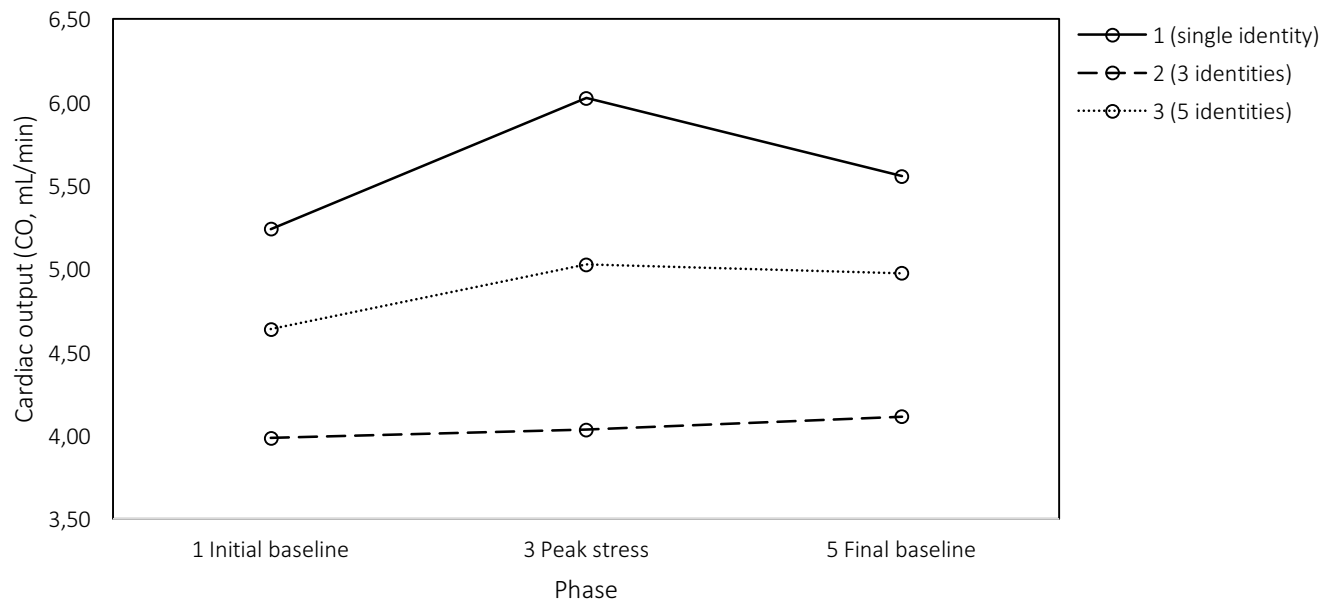


Figure 5.1 Cardiac output (CO) reactivity and recovery by condition.

Total Peripheral Resistance (TPR): There was no between-participants main effect for TPR reactivity ($F(2, 76) = 1.27, p = .29, \eta_p^2 = .03$). Thus, there were no statistically significant differences between conditions on this outcome variable in response to the stressor.

Looking further at within condition reactivity scores also revealed no statistically significant results. The general pattern is somewhat interesting, though (see Figure 5.2). Specifically, conditions 1 and 2 (single identity and three identities, respectively) did not seem to react to the stressor at all, recording only very slight decreases. People in condition 3 (five identities), however, recorded a relatively dramatic drop in TPR during the stressor (consistent with challenge orientation).

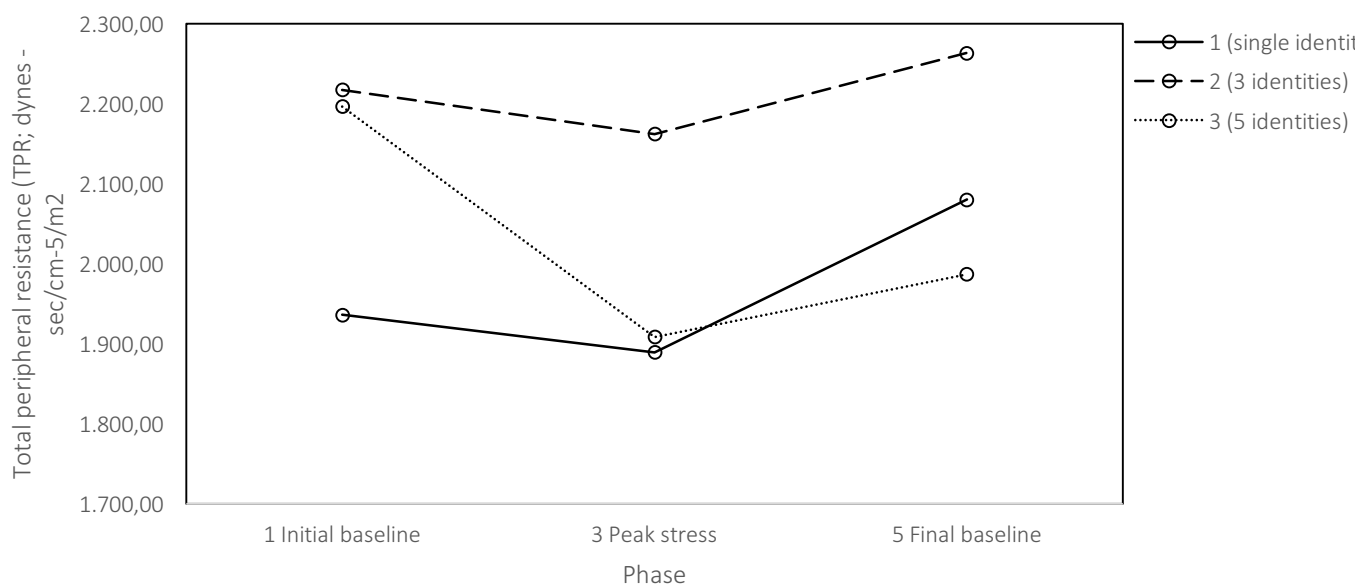


Figure 5.2 Total peripheral resistance (TPR) reactivity and recovery by condition.

Pre-ejection Period (PEP): There was no significant between-participants main effect for PEP in terms of reactivity ($F(2, 74) = 1.39, p = .26, \eta_p^2 = .04$). Thus, there was no between conditions difference in reactivity to the stressor.

Looking at reactivity and recovery from the stressor within each condition, we found that people in condition 1 and 2 recorded non-significant increases in response to the stressor, while condition 3 experienced a significant decrease in PEP ($m^{dif} = -.01, t(26) = -2.17, p = .04, 95\% \text{ CI } [-.01, -.00]$) before returning to baseline ($m^{dif} = .00, t(26) = .88, p = .39, 95\% \text{ CI } [-.01, .01]$) (see Figure 5.3).

Thus, while participants with a single identity or three identities activated experienced increased (non-significant) PEP in response to the stressor, people reflecting on five identities recorded a significant decrease, consistent with challenge orientation.

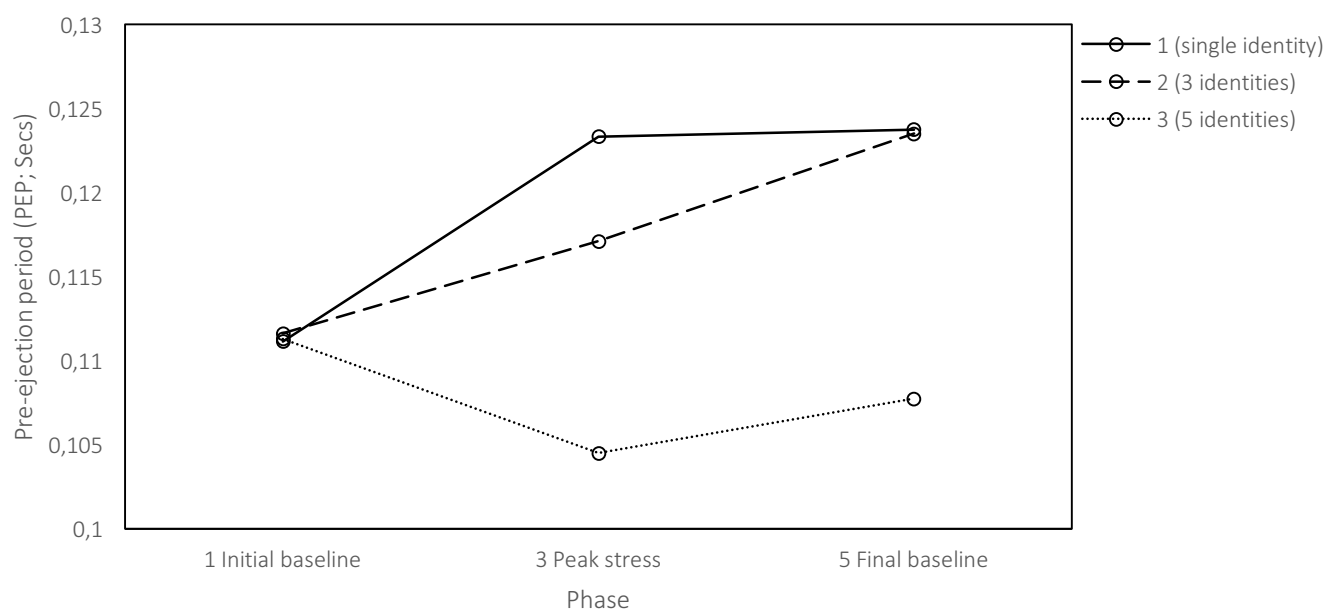


Figure 5.3 Pre-ejection period (PEP) reactivity and recovery by condition.

Respiratory sinus arrhythmia (RSA): For RSA there was no between-participants main effect for reactivity ($F(2, 75) = 1.10, p = .34, \eta_p^2 = .03$) (see Figure 5.4). Thus, there were no statistically significant differences between conditions in terms of participant RSA in response to the stressor.

Similarly, looking at reactivity scores within conditions revealed no statistically significant differences in RSA responses to the stressor compared to baseline.

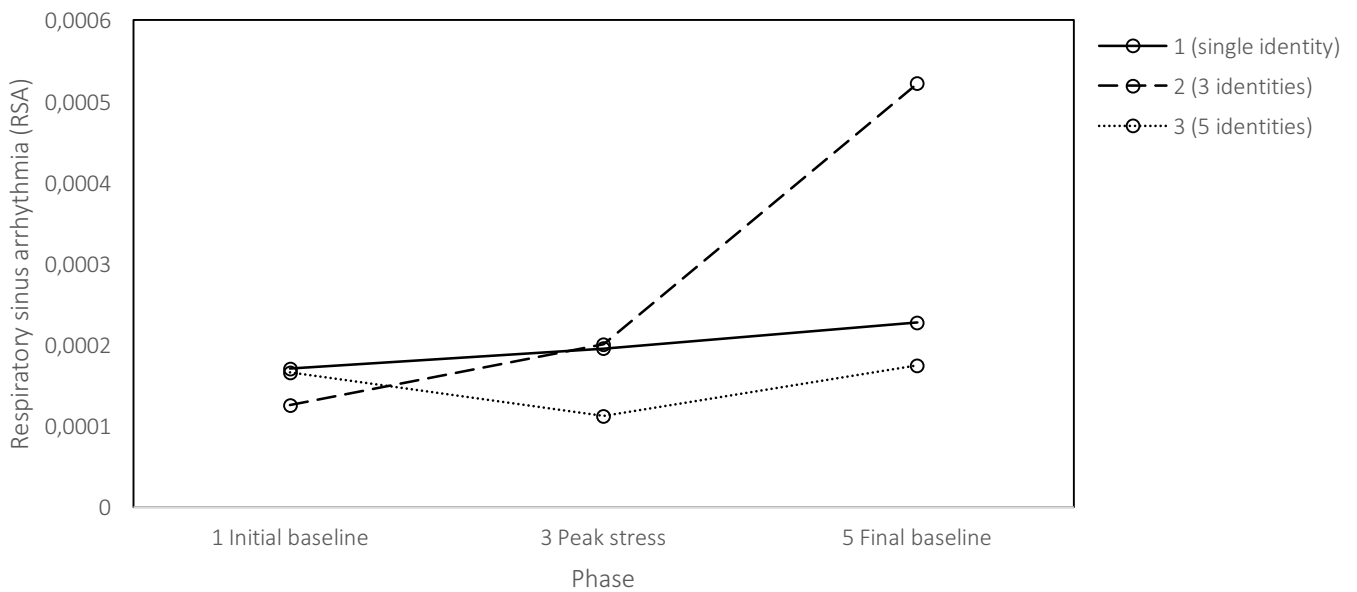


Figure 5.4 Respiratory sinus arrhythmia (RSA) reactivity and recovery by condition.

In summary, the reactivity analysis of our main outcome variables yielded some relatively weak results. No between or within condition effects were evident on RSA or our threat/challenge index (TCI). Further, contrary to our hypotheses, people focusing on a single identity (condition 1) displayed marginally greater CO during the stressor than people reflecting on three identities (condition 2), thus perceiving the stressor as more of a challenge than a threat, relative to condition 2. The former group was also the only one to significantly increase in CO in response to the stressor, also an indication of challenge orientation.

On the other hand, people with five identities activated (condition 3) displayed significant decreases in PEP in response to the stressor while neither of the other two conditions showed any such variability. This is consistent with challenge orientation, and thus provides some support for our hypotheses that multiple identities facilitate resilience in the face of adversity. The (non-significant) pattern evident in the TPR results complements the observed PEP reactivity. While staying level in people reflecting on one or three identities, TPR decreases (non-significantly) in

response to the stressor in participants focusing on five identities – a pattern suggestive of challenge orientation.

Overall then, our reactivity results are somewhat inconclusive. While PEP and TPR results hint at challenge orientation in people with five identities activated (as predicted), CO patterns suggest the perception of challenge in people with only a single identity activated. In other words, while these results do not refute our hypotheses, they also do not provide particularly strong support.

Exploratory analysis of variance

While psychophysiological research into reactivity and threat and challenge typically focus more or less exclusively on comparisons between baseline and stressor and recovery, it is nonetheless possible to analyse the data in its entirety, including, in our case, the extra phases, *identity activation* (phase 2) and *post-stress* (phase 4). Including these phases of the experiment in the analyses allows for a more complete analysis of the data. Thus, to ascertain any differences between and within conditions along all five phases of the experiment, 3 (condition) x 5 (time) mixed analyses of variance with repeated measures on the second factor were performed. Similar to the reactivity analyses above, the following results relate to the four primary outcome variables, *cardiac output* (CO), *total peripheral resistance* (TPR), *pre-ejection period* (PEP), and *respiratory sinus arrhythmia* (RSA).

Cardiac Output (CO): There was a significant between-participants main effect for condition ($F(2, 73) = 6.53, p < .001, \eta_p^2 = .17$). Participants in Condition 1 (single identity) had greater CO than participants in Condition 2 (three identities) ($m^{\text{dif}} = 1.51, p < .001, 95\% \text{ CI } [.58, 2.44]$), but not than

participants in Condition 3 (five identities). Thus, people with a single identity activated experienced higher CO during the study than people with three and five identities activated.

There was also a marginally significant within-participants main effect for CO across time ($F(1, 73) = 3.42, p = .06, \eta_p^2 = .00$). Participant CO increased significantly from phase 1 to phase 2 ($m^{\text{dif}} = .20, p = .04, 95\% \text{ CI } [.01, .40]$) and remained stable throughout the rest of the experiment with a slight, but non-significant decrease during phase 5 ($m^{\text{dif}} = -.16, p = .27, 95\% \text{ CI } [-.44, .13]$). As such, in comparison to their initial baseline, participant CO increased in response to the identity activation phase and remained at this level of output throughout the experiment.

There was no significant interaction between time and condition for CO, $F(2, 73) = 1.32, p = .27, \eta_p^2 = .01$. However, probing further to test the hypotheses directly, we found several significant patterns in the data that differed across conditions. For people in Condition 1 (single identity) there was a marginally significant increase in CO from Phase 2 to Phase 3 ($m^{\text{dif}} = .37, p = .07, 95\% \text{ CI } [-.04, .77]$). Similarly, people in Condition 3 (five identities) significantly increased in CO between Phase 1 and 4 ($m^{\text{dif}} = .55, p = .05, 95\% \text{ CI } [-.00, 1.11]$). There was no significant fluctuation in CO for participants in Condition 2 (three identities). Thus, participants in Condition 1 perceived challenge in response to *peak stress* (Phase 3) while participants in Condition 3 similarly increased in CO from *identity activation* (Phase 2) through *post stress* (Phase 4) (see Figure 5.1).

In addition, between-condition estimated marginal means indicated a general pattern where participants in Condition 1 (single identity) had greater CO than participants in Condition 2 (three identities) throughout the entire experiment (Phase 1: $m^{\text{dif}} = 1.16, p < .001, 95\% \text{ CI } [.34, 1.97]$; Phase 2: $m^{\text{dif}} = .98, p = .02, 95\% \text{ CI } [.15, 1.82]$; Phase 3: $m^{\text{dif}} = 1.59, p < .001, 95\% \text{ CI } [.74, 2.43]$; Phase 4: $m^{\text{dif}} = 1.48, p < .001, 95\% \text{ CI } [.49, 2.46]$; Phase 5: $m^{\text{dif}} = 1.72, p < .001, 95\% \text{ CI } [.62, 2.82]$). Further, participants in Condition 3 (five identities) had greater CO than participants in Condition 2

(three identities) during Phase 3 ($m^{dif} = .95, p = .03, 95\% \text{ CI } [.12, 1.79]$), Phase 4 ($m^{dif} = 1.13, p = .02, 95\% \text{ CI } [.19, 2.11]$) and Phase 5 ($m^{dif} = 1.12, p = .04, 95\% \text{ CI } [.03, 2.20]$).

The total pattern across analyses of participant CO therefore revealed a general tendency where people with three identities activated had significantly lower CO during the whole experiment than people with only a single identity activated, and lower CO during the last three phases of the experiment than people with five identities activated (see Figure 5.5). Further, only people with a single identity (marginal) appeared to react to the task at all, and did so with physiological markers consistent with challenge orientation (i.e., increased CO). While people with five identities activated similarly increased in CO, they did so after the task during the post-stress phase.

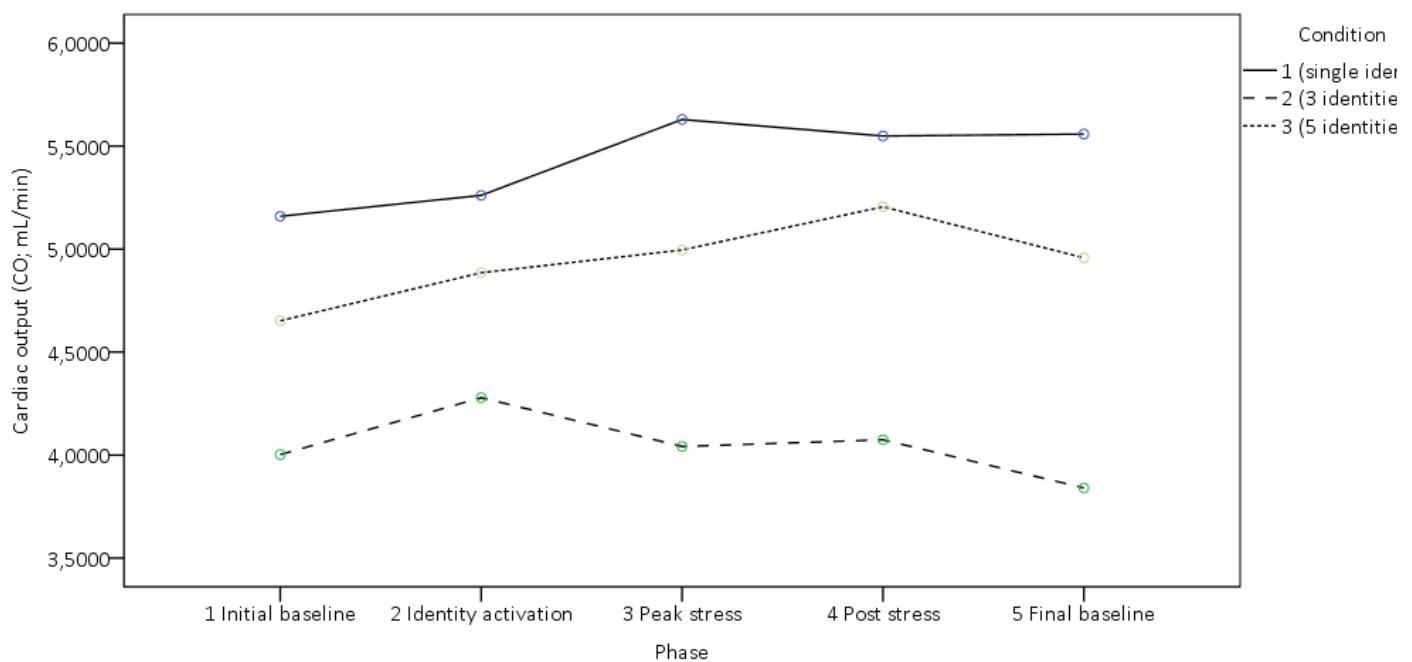


Figure 5.5 Mean cardiac output (CO) by condition across study phases.

Total Peripheral Resistance (TPR): There were no significant between-participants differences for TPR, $F(2, 73) = .26, p = .77, \eta_p^2 = .01$. There was, however, a significant within-participants main effect for time, $F(1, 73) = 4.19, p = .04, \eta_p^2 = .00$. The data indicated a general (but non-significant)

pattern where participant TPR decreased between Phases 1 and 3 ($m^{\text{dif}} = -94.80, p = .21, 95\% \text{ CI } [-242.98, 53.37]$) and then returned to baseline between Phases 3 and 5 ($m^{\text{dif}} = 131.93, p = .14, 95\% \text{ CI } [-47.63, 311.50]$). This general pattern was consistent with perceiving the task as a challenge rather than a threat.

There was also a significant condition by time interaction effect, $F(2, 73) = 3.01, p = .05, \eta_p^2 = .01$. Unpacking the interaction revealed that participants in Condition 1 (single identity) increased significantly in TPR between Phases 3 and 4 ($m^{\text{dif}} = 351.40, p = .03, 95\% \text{ CI } [22.88, 679.93]$) and then decreased marginally significantly between Phases 4 and 5 ($m^{\text{dif}} = -227.38, p = .08, 95\% \text{ CI } [-485.07, 30.32]$) recovering to their baseline. For participants in Condition 2 (three identities), TPR decreased non-significantly between Phases 1 and 4, before increasing significantly between phases 4 and 5 ($m^{\text{dif}} = 293.73, p = .02, 95\% \text{ CI } [36.04, 551.43]$) recovering to their baseline. For participants in Condition 3 (five identities) there was a marginally significant decrease in TPR between Phases 1 and 3 ($m^{\text{dif}} = 226.66, p = .08, 95\% \text{ CI } [-26.63, 479.12]$) before an eventual increase between Phases 4 and 5, recovering to baseline (Figure 5.6).

Thus, the main differences in TPR across time occurred for people with a single identity activated and people with five identities activated. The former group experienced a slight (non-significant) increase in response to the stressor, followed by a significant spike in TPR during *post stress* (phase 4) – a pattern consistent with threat orientation. By contrast, however, people with five identities activated experienced a decrease in TPR throughout the first four phases, with a significant drop from *initial baseline* (Phase 1) to *peak stress* (Phase 3) (see Figure 5.3). This physiological reaction is indicative of the participant perception of the the task as a challenge rather than a threat.

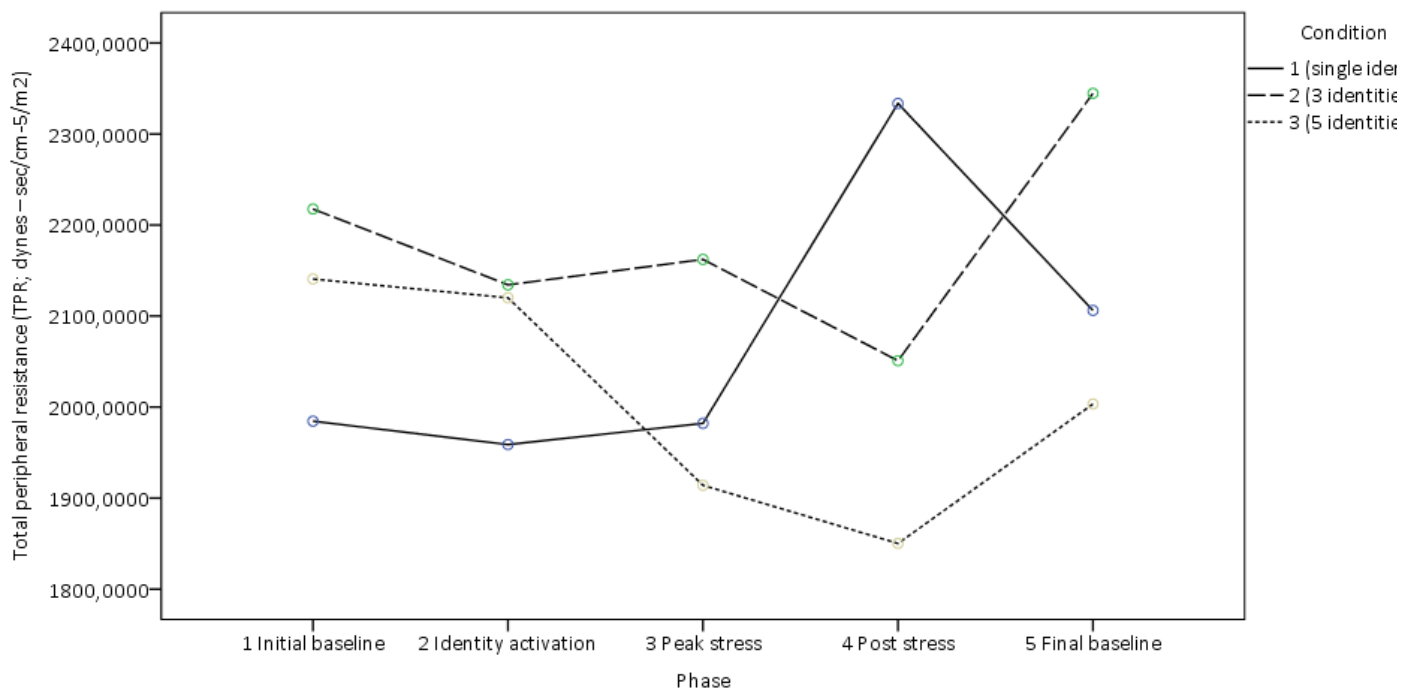


Figure 5.6 Mean total peripheral resistance (TPR) by condition across study phases.

Pre-ejection Period (PEP): There was no significant between-participants main effect for PEP, $F(2, 74) = 1.87, p = .16, \eta_p^2 = .05$. There was, however, a significant within-participants main effect for time, $F(1, 74) = 4.19, p = .03, \eta_p^2 = .02$. Between Phases 1 and 2, participant PEP became longer ($m^{\text{dif}} = .01, p < .001, 95\% \text{ CI } [.00, .02]$), only to shorten between Phases 2 and 3 ($m^{\text{dif}} = -.01, p < .001, 95\% \text{ CI } [-.02, -.00]$). PEP finally increased in length again between Phases 3 and 5 ($m^{\text{dif}} = .01, p = .03, 95\% \text{ CI } [.00, .01]$). There thus appeared to be an increase in PEP in response to *identity activation* (Phase 2), followed by a decrease during *peak stress* (Phase 3), and finally a return to baseline during the final resting period (Phase 5). This pattern is consistent with perceptions of challenge.

There was no significant interaction effect for time and condition, $F(2, 74) = 1.00, p = .43, \eta_p^2 = .01$. However, exploring the data in further detail to test the specific hypotheses, we found that participants in Condition 1 (single identity) increased significantly in PEP from phase 1 to phase 2 ($m^{\text{dif}} = .02, p = .01, 95\% \text{ CI } [.01, .03]$), and then decreased significantly from Phase 2 to Phase 3

($m^{\text{dif}} = -.01, p = .02, 95\% \text{ CI } [-.03, -.00]$). They then increased slightly and non-significantly during the last two phases of the experiment, ultimately recording significantly longer PEP during Phase 5 than phase 1 ($m^{\text{dif}} = .01, p = .04, 95\% \text{ CI } [.00, .03]$). In Condition 2 (three identities), PEP was marginally longer during Phase 5 than Phase 1 ($m^{\text{dif}} = .01, p = .06, 95\% \text{ CI } [-.00, .03]$). For participants in Condition 3 (five identities), PEP decreased significantly from Phase 2 to 3 ($m^{\text{dif}} = -.02, p < .001, 95\% \text{ CI } [-.03, -.00]$) and remained marginally significantly shorter during Phase 4 compared to Phase 2 ($m^{\text{dif}} = -.01, p = .08, 95\% \text{ CI } [-.03, .00]$), before returning fully to their initial baseline in Phase 5. Participants in all condition 1 and 3, in particular, thus generally followed the same pattern across experiment phases with significant decreases in PEP in response to the stressor (Phase 3) and then a slight and gradual recovery during *post stress* (Phase 4) and *final baseline* (Phase 5) (see Figure 5.7). This tendency indicates that participants felt that the resources they had at their disposal were greater than, or at least matched the demands of the task presented to them during the stressor. As such, they appeared to view the task as a challenge.

Examining between-participants results revealed marginally significant differences during Phases 3 through 5 (see Figure 5.4). In particular, participants in Condition 3 had marginally significantly shorter PEP during Phase 3 than participants in Condition 2 ($m^{\text{dif}} = .01, p = .06, 95\% \text{ CI } [-.00, .03]$) and condition 1 ($m^{\text{dif}} = .01, p = .07, 95\% \text{ CI } [-.00, .03]$). Similarly, there was a near significant difference between people in Conditions 3 and 2 during Phase 4 with people in Condition 3 recording shorter PEP ($m^{\text{dif}} = .02, p = .08, 95\% \text{ CI } [-.00, .04]$). Finally, people in Condition 3 recorded shorter PEP during Phase 5 than people in both Condition 2 ($m^{\text{dif}} = .02, p = .09, 95\% \text{ CI } [-.00, .03]$) and Condition 1 ($m^{\text{dif}} = .02, p = .07, 95\% \text{ CI } [-.00, .04]$).

Thus, participants in all three conditions displayed a comparable pattern of PEP fluctuation across the duration of the experiment, reacting to the stressor (Phase 3) in a fashion consistent

with challenge orientation (i.e., decreased PEP; only significant for conditions 1 and 3). However, participants with five identities activated reacted to the stressor with shorter PEP than participants with three identities or a single identity activated. Further, by Phase 5, people focusing on five identities had recovered completely to their initial baseline. People focusing on three identities, made a near full recovery, while people focusing on a single identity did not recover, recording significantly longer PEP during the final phase than during their initial baseline. In other words, the condition with most identities activated (Condition 3) responded to the task in a more adaptive fashion and these participants also returned to their initial baseline after the stressor quicker than participants with fewer identities activated (Conditions 1 and 2).

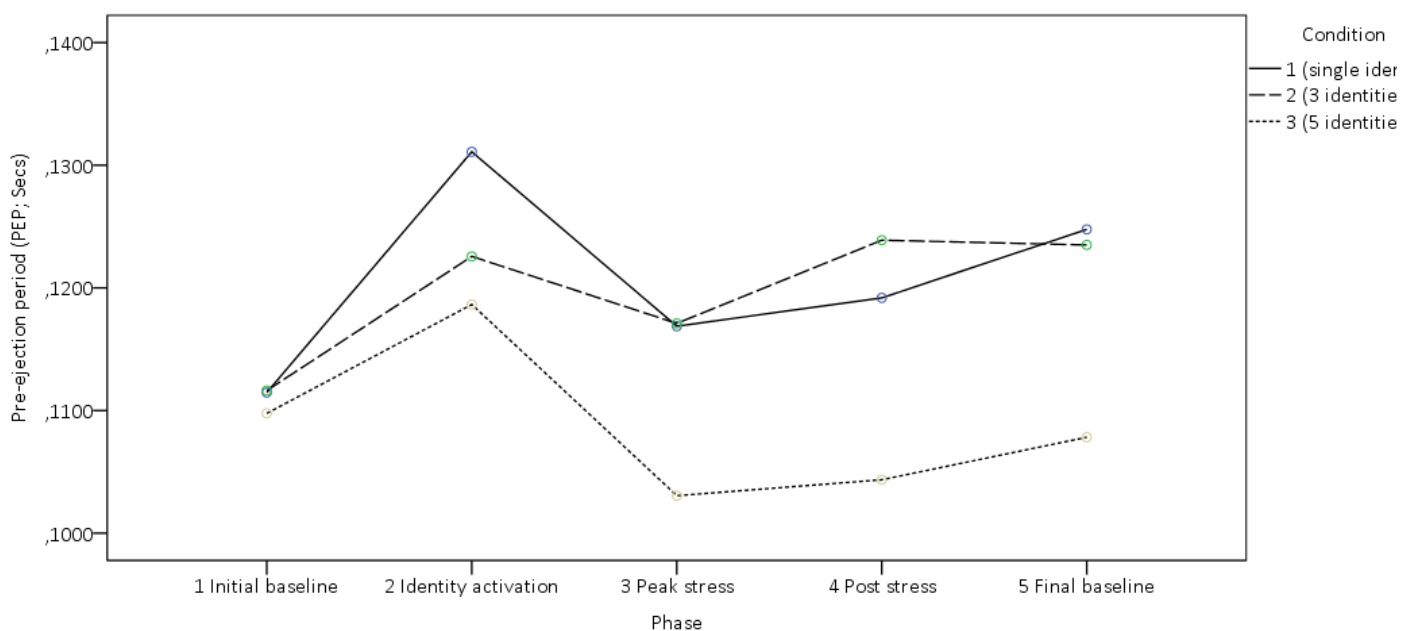


Figure 5.7 Pre-ejection period (PEP) by condition across study phases.

Respiratory sinus arrhythmia (RSA): For RSA there was no between-participants main effect, $F(2, 67) = .52, p = .59, \eta_p^2 = .02$. There was, however, a significant within-participants main effect for time, $F(1, 67) = 7.20, p < .001, \eta_p^2 = .04$. Specifically, participants experienced a significant increase in RSA between Phases 3 and 4 ($m^{\text{dif}} = .0001, p < .001, 95\% \text{ CI } [.00004, .0002]$). RSA during

Phase 4 was also significantly higher than that registered in Phase 2 ($m^{\text{dif}} = .0001, p < .001, 95\% \text{ CI } [.00007, .0002]$). RSA stabilized during Phase 5. Thus, participants increased in RSA as they were presented with the stressor in Phase 3 and this effect carried over into the *post stress* period (phase 4), before levelling off during the final baseline (Phase 5).

There was no significant interaction effect for time and condition, $F(2, 67) = 1.11, p = .36, \eta_p^2 = .02$. However, looking at the estimated marginal means to test the hypotheses directly, we discovered several significant patterns that differed across conditions. Specifically, for participants in Condition 1 (single identity), RSA during phase 5 was marginally greater than during Phase 1 ($m^{\text{dif}} = .000111, p = .08, 95\% \text{ CI } [-.000013, .000236]$) and significantly greater than in Phase 2 ($m^{\text{dif}} = .0001, p = .04, 95\% \text{ CI } [.000001, .000205]$) and Phase 3 ($m^{\text{dif}} = .0001, p = .02, 95\% \text{ CI } [.00001, .000234]$). For participants in Condition 2 (three identities) there was a significant increase in RSA from Phase 2 to Phase 3 ($m^{\text{dif}} = .00007, p = .05, 95\% \text{ CI } [-.000001, .000145]$) and again from Phase 3 to Phase 4 ($m^{\text{dif}} = .000141, p < .001, 95\% \text{ CI } [.000037, .000244]$). While this dropped off towards the end of the experiment, their RSA in Phase 5 was still marginally significantly higher than their initial RSA in Phase 1 ($m^{\text{dif}} = .000111, p = .08, 95\% \text{ CI } [.000014, .000235]$). Finally, participants in Condition 3 (five identities) experienced a significant increase in RSA between Phases 2 and 4 ($m^{\text{dif}} = .000109, p = .04, 95\% \text{ CI } [.000005, .000212]$) and a marginally significant increase between Phases 3 and 4 ($m^{\text{dif}} = .000089, p = .08, 95\% \text{ CI } [-.000012, .000190]$), before returning to baseline in Phase 5 (Figure 5.8).

Thus, people with multiple identities activated (Conditions 2 and 3) responded to the stressor with RSA markers consistent with relative calmness and mental focus (only significantly so for people with three identities activated), and participants with the most identities activated (Condition 3) recovered fully to their initial baseline during the final resting period (Phase 5).

Further, although the difference was non-significant, people focusing on a single identity responded to the stressor in a way consistent with the experience of stress (decreased RSA), before increasing through the final two stages with no recovery to their initial baseline.

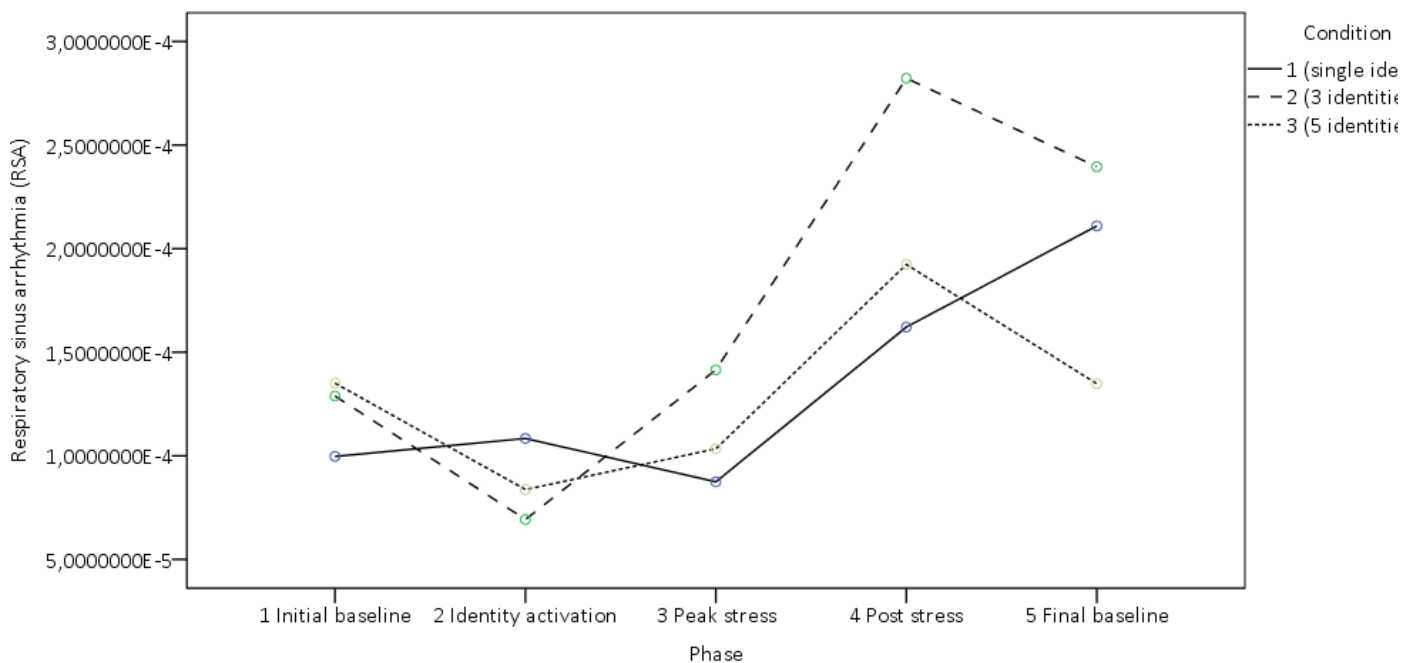


Figure 5.8 Respiratory sinus arrhythmia (RSA) by condition across study phases.

In sum, our two methods of analysis – that is, reactivity scores analysis and repeated measures analysis of variance – generated somewhat different results. As mentioned above, the results based on reactivity scores were relatively sparse and inconclusive. These analyses showed increased CO in response to the stressor in people focusing on a single identity (condition 1), as well as patterns in PEP and TPR reactivity that hinted at challenge perception in people focusing on five identities (condition 3). The relatively unclear nature of these results is likely due to the fact that only three (of five) phases of the experiment – namely, *initial baseline*, *stress peak*, and *final baseline* – were compared. That is, because analysis of reactivity scores focuses purely on differences between baseline, stressor, and recovery, this method allows us only to take into account a single time-point (initial baseline) to compare with stressor reactivity and recovery

between and within conditions. In our repeated measures analyses, however, we included the remaining two phases, *identity activation* and *post-stress*, which allowed us to test differences between all five time-points within and between conditions simultaneously, ultimately giving us more comprehensive insight into the relationships in the data. In other words, these results are based on testing the trajectories between all five time points within and between conditions (repeated measures analysis) – for instance by using identity activation (time-point 2) as a second baseline and post-stress (time-point 4) as an initial measure of recovery. This, in turn, gives us a more complete picture of the data.

Discussion

We hypothesized that people with more identities activated would react to, and recover from, the stressor in a more adaptive manner than people with a single identity activated. Our results generally supported this expectation. Specifically, people focusing on multiple identities (Conditions 2 and 3) approached the stressor and post stress phase with physiological markers consistent with challenge orientation, reacting with increases in CO (significant for Condition 1) and RSA (significant for Condition 2) and decreases in TPR (significant for Condition 3) and PEP (significant for Conditions 1 and 3). People reflecting on a single identity responded to the stress and post-stress phases with increased TPR (consistent with threat orientation), and a decrease in PEP (consistent with challenge orientation). Further, only people in Condition 3 (five identities) recovered fully to their baseline by the end of the experiment on all physiological measurements with people in Conditions 1 and 2 only returning to baseline on CO and TPR. Thus, although it is revealed slightly differently across measures, there is a relatively clear pattern in the data, indicating an advantage in dealing with and recovering from stress for people focusing on multiple

identities. Whether reflecting on few identities is actually detrimental (i.e., perceiving threat rather than challenge as indicated by TPR results for people in Condition 1) or merely lessens the benefits of more identities (as suggested by the lack of recovery on RSA and PEP) is unclear. Overall, however, these results provide evidence generally consistent with past research that more identities in some way cushion or buffer the effects of adversity and stress (Jetten et al., 2010; J. M. Jones & Jetten, 2011; Mussweiler et al., 2000).

Given the generally high compatibility attributed by participants to their own identities, this study says little about the potentially moderating impact of specific identity features and their combination in the self-concept on the effects of multiple group membership. As outlined in the introduction, however, we set out to elaborate on our own results, presented in the previous chapter, as well as those of past research (Jones & Jetten, 2011), by not only improving on the research methodology (i.e., by using cardiovascular outcome measures to gauge resilience), but also by expanding the focus to account for identity compatibility as well as number. Thus, the question of whether the effects of identity compatibility, observed in Chapter 3, are also discernible in the present context remains. In order to answer this question conclusively, we ran a second experimental study that directly manipulated identity compatibility.

Study 5

Study 4 provides baseline evidence that the greater the number of group memberships active in the individual's self-concept the better off he or she is in terms of dealing with a stressful task. However, while the observed patterns were consistent with the hypothesis, they were generally weak, suggesting that multiple group memberships may not be straightforwardly powerful sources of resilience. Given the results of Study 3 as well as the past research outlined in Chapter 2, which suggests the importance of identity compatibility in the relationship between multiple group membership and well-being, it would seem that it is multiple *compatible* identities that unlock the benefits of multiple group memberships (Brook et al., 2008; Iyer et al., 2009). In light of this, and considering the suggestive but weak findings from Study 4, we designed a study nearly identical to Study 4, but with an extra component to test the impact of multiple compatible (versus multiple incompatible) identities on resilience. Specifically, we hypothesized that people focusing on multiple compatible identities would react to the experimental task as a challenge rather than a threat (shorter PEP, lower TPR, greater CO and higher RSA). Similarly, we expected people focusing on multiple incompatible identities or a single identity to react to the task as a threat rather than a challenge (longer PEP, higher TPR, lower CO and RSA). We also predicted that people with multiple compatible identities activated would recover from the stressor more efficiently than participants focusing on incompatible identities or a single identity.

Method

Participants

Study advertisement was identical to that of Study 4. An initial sample of 106 participants was recruited for the study. Of these, 11 were excluded for one or more of the following reasons: (i) the participant did not show up, (ii) the participant felt uncomfortable with the physiological equipment

and withdrew from the experiment, (iii) the physiological equipment malfunctioned, or (iv) disruptions occurred during testing, compromising the veracity of the physiological data (e.g., external noise, people entering the testing cubicle, etc.). Thus, the final sample comprised 95 first-year female psychology students. All of the participants were between 19 and 25 years of age, with the majority identifying as British (British = 79.2%, Other European = 19.2%, South-East Asian = 1.6%). Participants received course credit in return for their participation.

Cardiovascular data collection, quantification and outcome measures

Cardiovascular data collection and quantification were carried out in a fashion identical to that of Study 1. Similarly, the outcome measures were the same, and thus comprised: (i) *cardiac output* (CO), (ii) *pre-ejection period* (PEP), (iii) *total peripheral resistance* (TPR) and (iv) *respiratory sinus arrhythmia* (RSA).

Study design and procedure

Study 5 was designed in the same way as Study 4. The computer questionnaire constructed to activate a particular number of identities in participants, as well as the mind puzzles and speech preparation task were all the same as in the first study. Similarly, the procedure was identical to that used in Study 4 with the exception of the manipulation of identity compatibility.

Identity compatibility manipulation

In order to operationalize identity compatibility, we made slight changes to the manipulation design, similar to those used in Study 3 (Chapter 4). Participants in Condition 1 ($n = 31$) were asked to categorize themselves in terms of a single identity based on social category membership with one of three randomized social categories (gender, study major [psychology], nationality). In both Conditions 2 ($n = 32$) and 3 ($n = 32$), participants categorized themselves in terms of three identities

(gender [female], study major [psychology] and nationality). Following the manipulation established in Study 3, the *identity activation* phase of the experiment (Phase 2) – where participants were asked to write down what it meant to them to belong to the given social categories – was framed slightly differently between Conditions 2 (compatible) and 3 (incompatible). Specifically, in these conditions, identity compatibility of female gender and psychology study major was manipulated by first highlighting the idea of gender differences in thought processes and then enhancing stereotypically female and male qualities of what it means to be a psychologist (i.e., caring, understanding and helping tendencies vs. statistics driven, scientific discovery, respectively). This was done by adding a few extra sentences to the *identity activation* instructions for gender and study major, which originally read: ‘In a few sentences, please write down why being [category X] is important or unimportant to you. What does it mean to you to be [category X]?’ In Conditions 2 and 3 the text for gender was revised to include: ‘...there are also differences between genders. For example, there is scientific evidence that men and women often have different strengths, weaknesses and preferences when thinking about various things. In a few sentences, please write down why being female is important or unimportant to you.’ Following this, the instructions for *study major* in Condition 2 (compatible) were revised to enhance compatibility between *gender* and *study major*: ‘Finally different areas of study cultivate different skills. For example, your field of study (psychology) focuses on understanding human behavior and helping those with psychological problems. In a few sentences, please write down why being in the field of psychology is important or unimportant to you.’ Similarly, the instructions for *study major* in Condition 3 (incompatible) were revised to enhance incompatibility between *gender* and *study major*: ‘Finally different areas of study cultivate different skills. For example, your field of study (psychology) is a statistics driven

science that focuses on the biological and evolutionary bases of behavior. In a few sentences, please write down why being in the field of psychology is important or unimportant to you.'

Once testing was over, the participant was then asked to fill out the same task evaluation questionnaire as in Study 4, assessing the participant's mood and affect, perception of task difficulty, stress levels as well as measures of perceived identity compatibility of the social categories with which the participant had identified.

Results

Analytic strategy

Identical to Study 4, data analysis for this study was conducted in four stages. First, descriptive statistics for participant responses to the evaluation questionnaire were calculated (see Table 5.3 for means and SDs). The averages for the main outcome variables (CO, TPR, PEP, RSA) were then calculated for each of the five baselines (Table 5.4). We then assessed task engagement to ensure that we could interpret the results within the threat versus challenge paradigm. Next, we analysed reactivity to and recovery from the stressor between and with conditions on each of the four main outcome variables. We also combined CO and TPR into a threat/challenge index (TCI) and added this in our analyses as a fifth outcome variable. Finally, and similar to Study 4, we conducted repeated measures analyses of variance to ascertain any effects on the outcome variables between and within conditions, taking into account all five phases of the experiment. Of primary interest were the hypothesized relationship between number of identities activated, perceived identity compatibility and cardiovascular response to stress.

Descriptive findings

Participants rated the puzzles and the speech preparation task significantly below the scale midpoint (3) for the degree to which it was *easy* ($t(83) = -1.98, p = .05$) and above the scale midpoint for *enjoyable* ($t(83) = 3.19, p < .001$) and *challenging* ($t(83) = 5.13, p < .001$) (see Table 5.3). *Frustration* and *exhaustion* experienced during and after the task was below the scale midpoint ($t(83) = -10.04, p < .001$ and $t(83) = -11.87, p < .001$, respectively). Participants were also quite happy post testing (*Happy*: $t(83) = 7.40, p < .001$; *Sad*: $t(67) = -16.23, p < .001$) (see Table 5.3). Thus, participants felt that the tasks were relatively difficult and challenging to manage and solve, although this did not appear to affect their mood negatively.

Overall, participants perceived the identities in which they were categorized as relatively high in both identity compatibility ($t(51) = 8.43, p < .001$) and identity importance ($t(83) = 27.38, p < .001$) (see Table 5.3). Thus, participants perceived the listed identities as fitting well together and centrally positioned in their overall self-concept.

All but one of the between condition differences on the evaluation measures were non-significant ($F_s(2, 82) < 1.61, p_s > .21$). As expected, participants in Condition 2 (compatible) rated identity compatibility significantly higher ($M = 4.50, SD = 0.54$) than did participants in Condition 3 (incompatible) ($M = 4.13, SD = 0.75$) $t(51) = 4.25, p = .04$.

Table 5.3 Identity centrality and evaluation questionnaire response means and SDs.

Variable	Mean (SD)
Easy	2.73 (1.22)*
Enjoyable	3.36 (1.03)*
Challenging	3.60 (1.10)*
Stressful	2.84 (1.11)
Frustrated	1.93 (0.97)*
Motivated	3.33 (0.78)*
Exhausted	1.93 (0.82)*
Happy	3.54 (0.67)*
Sad	1.58 (0.80)*
Identity compatibility	4.32 (0.97)*
Identity importance	5.41 (0.63)*

* $p < .05$, ** $p < .01$. All scale midpoints = 3, except for *Identity centrality* = 4.

Table 5.4 Mean physiological output for each experimental phase.

	Cond.	Baseline phase mean (SD)				
		1 Rest	2 Id activation	3 Stress peak	4 Stress relief	5 Rest
(beat/min)	1	81.00 (12.47)	86.64 (13.36)	87.39 (11.56)	80.95 (12.47)	81.11 (11.4)
	2	79.61 (9.26)	83.37 (8.99)	83.70 (9.56)	79.63 (8.04)	79.25 (8.79)
	3	82.07 (12.08)	88.37 (14.14)	87.62 (15.10)	82.11 (12.63)	79.71 (13.0)
	M	80.90 (11.30)	85.06 (11.85)	86.24 (12.28)	80.60 (10.80)	80.60 (14.4)
(L/min)	1	3.46 (1.10)	3.77 (1.21)	3.82 (1.19)	3.93 (1.27)	3.85 (1.31)
	2	4.09 (1.49)	4.20 (1.67)	4.35 (1.62)	4.18 (1.62)	3.80 (1.28)
	3	3.70 (1.20)	3.92 (1.22)	4.05 (1.29)	3.93 (1.27)	3.81 (1.30)
	M	3.75 (1.29)	3.96 (1.38)	4.07 (1.40)	3.98 (1.39)	3.75 (1.27)
3P (mmHg)	1	106.55 (10.92)	103.95 (11.67)	105.77 (11.42)	103.68 (11.37)	81.98 (39.2)
	2	103.15 (10.72)	102.33 (9.62)	102.33 (9.62)	98.78 (9.45)	94.10 (25.5)
	3	102.37 (10.00)	103.57 (11.69)	100.25 (13.09)	98.14 (12.69)	97.77 (13.5)
	M	104.13 (10.59)	105.33 (11.78)	102.93 (11.56)	100.27 (11.34)	100.49 (12.1)
R (dynes, sec/cm ⁻⁵ /m ²)	1	2564.08 (907.33)	2503.18 (857.52)	2546.64 (980.94)	2506.73 (1013.73)	2538.20 (893.)
	2	2274.96 (825.61)	2290.37 (815.58)	2219.39 (786.48)	2233.91 (822.87)	2239.03 (822.)
	3	2423.22 (763.72)	2386.72 (788.98)	2533.39 (1013.44)	2336.84 (849.72)	2397.56 (811.)
	M	2422.23 (834.88)	2394.56 (817.69)	2434.31 (935.49)	2359.39 (897.53)	2391.54 (843.)
P (seconds)	1	0.11 (0.02)	0.11 (0.02)	0.11 (0.03)	0.11 (0.02)	0.11 (0.02)
	2	0.11 (0.02)	0.11 (0.02)	0.11 (0.02)	0.11 (0.02)	0.11 (0.02)
	3	0.11 (0.02)	0.11 (0.02)	0.11 (0.02)	0.11 (0.02)	0.12 (0.04)
	M	0.11 (0.02)	0.11 (0.03)	0.11 (0.03)	0.11 (0.02)	0.11 (0.02)
A	1	0.0002 (0.0003)	0.0002 (0.0005)	0.0001 (0.0002)	0.0004 (0.0003)	0.0002 (0.00)
	2	0.0002 (0.0002)	0.0001 (0.0001)	0.0003 (0.0009)	0.0002 (0.0002)	0.0002 (0.00)
	3	0.0001 (0.0001)	0.0039 (0.0213)	0.0001 (0.0001)	0.0002 (0.0001)	0.0001 (0.00)
	M	0.0002 (0.0001)	0.0014 (0.0122)	0.0002 (0.0005)	0.0002 (0.0003)	0.0002 (0.00)

Task engagement

In an identical fashion to that of Study 4, we measured task engagement by calculating a difference score for heart rate and PEP. We then tested whether this score was different to zero. A significant difference in either heart rate or PEP (preferably both) would indicate engagement with the task (Blascovich et al., 2011). This analysis revealed no change in PEP between baseline and the stressor (Phase 3), $m^{dif} = .00$, $t(97) = 1.46$, $p = .15$. By contrast, however, participant heart rate increased significantly in response to the stressor, $m^{dif} > 5.35$, $t(96) = 7.77$. Thus, there is overall support for task engagement, justifying interpretation of the CO, PEP, and TPR results in terms of threat and challenge.

Reactivity analysis

We conducted our reactivity analysis in a fashion identical to that of Study 4. Specifically, we focused on phase 1 (Rest), phase 3 (Stress peak), and phase 5 (Rest). We conducted multivariate analyses of variance, testing for differences between conditions in terms of reactivity in response to the stressor (phase 3) and recovery (phase 5) on the primary outcome variables, *cardiac output* (CO), *total peripheral resistance* (TPR), *pre-ejection period* (PEP), and *respiratory sinus arrhythmia* (RSA). We also inserted a threat/challenge index (TCI) of CO and TPR as a single indicator of threat and challenge. Testing for within-condition differences, we then conducted one-sample t-tests, comparing the change in arousal between the initial baseline (test value = 0) and both the stressor and the final baseline.

Reactivity analysis results

Threat/Challenge Index (TCI): Similar to Study 4, we computed a threat and challenge index (TCI) for CO and TPR scores (which are the main indicators of threat and challenge). Specifically, we

generated standardized scores for both variables, then reversed the TPR values so that increases in both CO and TPR indicated challenge orientation and decreases indicate threat perception, and then finally combined the two into a single variable, TCI $(-1 * z\Delta TPR) + (1 * z\Delta CO)$. We ran a one-way analysis of variance on this variable to ascertain any between condition differences. However, we found no statistically significant results ($F(2, 96) = .16, p = .85, \eta_p^2 = .00$).

Cardiac Output (CO): There were no significant effects of condition on CO reactivity ($F(2, 93) = .44, p = .65, \eta_p^2 = .01$). Thus, there were no statistically significant differences between conditions in terms of participant CO in response to the stressor.

Probing further, we tested the hypotheses directly by looking at reactivity scores in response to the stressor and during recovery within each condition. Thus, we compared reactivity and recovery scores to the initial baseline (zero). In terms of reactivity, people in all three conditions recorded significantly higher CO scores during the stressor compared to baseline (single identity: $m^{\text{dif}} = .36, t(32) = 4.69, p < .001, 95\% \text{ CI } [.20, .51]$; compatible identities: $m^{\text{dif}} = .26, t(31) = 2.64, p = .01, 95\% \text{ CI } [.06, .47]$, incompatible identities: $m^{\text{dif}} = .35, t(31) = 4.48, p < .001, 95\% \text{ CI } [.19, .51]$). The compatible and incompatible conditions also recovered to their initial baseline (compatible identities: $m^{\text{dif}} = .17, t(31) = 1.63, p = .11, 95\% \text{ CI } [-.04, .38]$, incompatible identities: $m^{\text{dif}} = .08, t(30) = 1.20, p = .24, 95\% \text{ CI } [-.05, .20]$). People focusing on a single identity (condition 1), however, did not ($m^{\text{dif}} = -.21, t(31) = -3.43, p < .001, 95\% \text{ CI } [-.34, .09]$) (see Figure 5.9). Thus, across conditions, CO reactivity was consistent with challenge orientation. However, only people with multiple identities activated made a full recovery to their baseline. People reflecting on a single identity, did not.

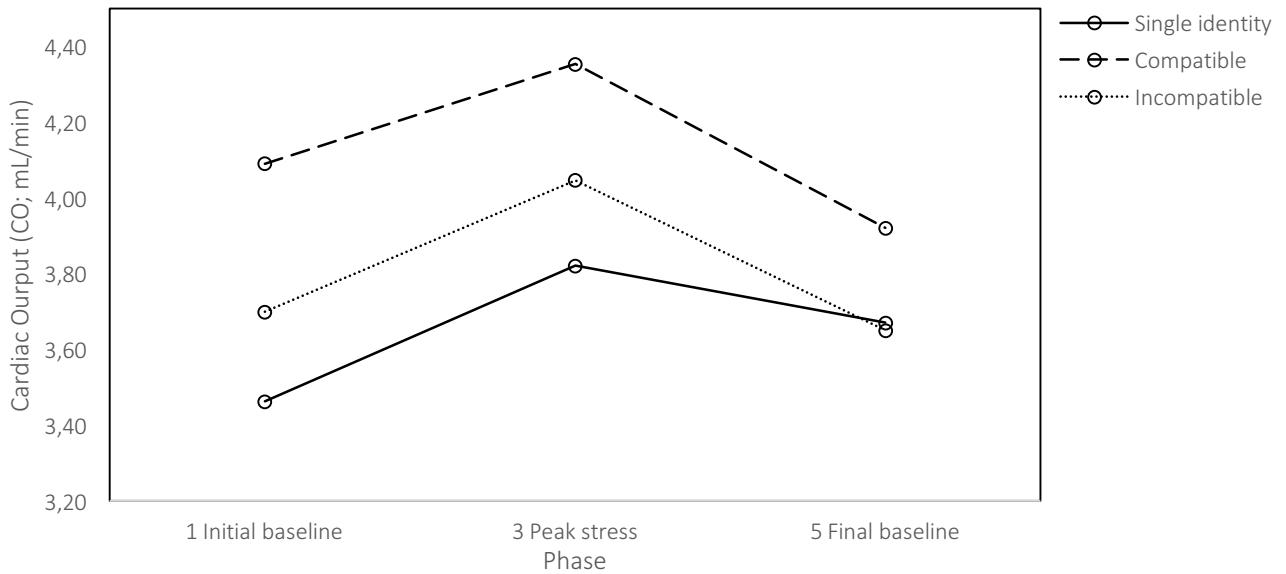


Figure 5.9 Cardiac output (CO) reactivity and recovery by condition.

Total peripheral resistance (TPR): There was no significant effect of condition on TPR reactivity ($F(2, 93) = .43, p = .65, \eta_p^2 = .01$). Thus, there were no between-condition differences in stressor TPR reactivity.

Similarly, there were no statistically significant differences in within-condition TPR reactivity compared against baseline (single identity: $m^{dif} = -17.44, t(32) = -.17, p = .86, 95\% \text{ CI } [-221.04, 186.17]$; compatible identities: $m^{dif} = -55.56, t(31) = -.45, p = .66, 95\% \text{ CI } [-308.31, 197.18]$; incompatible identities: $m^{dif} = 110.17, t(31) = .71, p = .47, 95\% \text{ CI } [-208.32, 428.67]$). Nonetheless, the general pattern of reactivity here is notable. People reflecting on multiple compatible identities decrease in TPR (consistent with challenge orientation) during the stressor while people with multiple incompatible identities activated increase (consistent with threat orientation). Those focusing on a single identity record almost zero reactivity in response to the stressor (see Figure 5.10). Thus, while there are no statistically significant results in relation to TPR, the within-condition reactivity score patterns are consistent with the hypotheses, indicating threat perception in people

with incompatible identities activated, and challenge orientation in people with compatible identities activated.

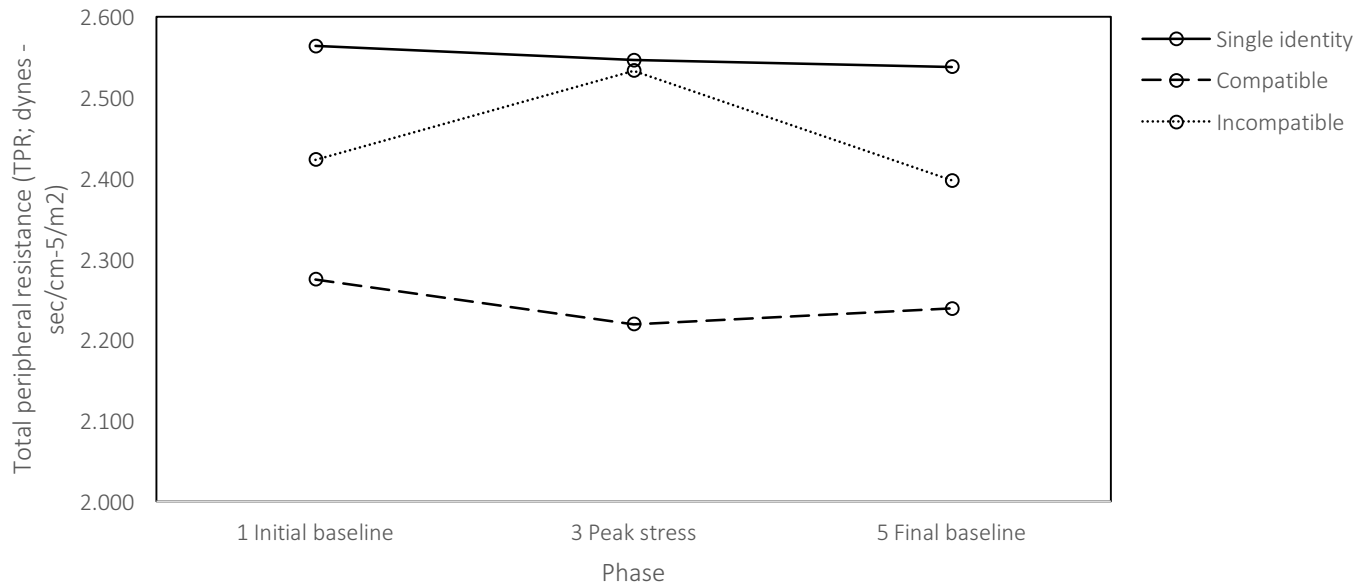


Figure 5.10 Total peripheral resistance (TPR) reactivity and recovery.

Pre-ejection Period (PEP): There was no significant effect of condition on PEP reactivity ($F(2, 93) = .44, p = .65, \eta_p^2 = .01$). Thus, there were no between-condition differences in stressor PEP reactivity (see Figure 5.11).

Similarly, we found no statistically significant within condition effects of PEP reactivity comparing against baseline (single identity: $m^{\text{dif}} = .01, t(32) = 1.23, p = .23, 95\% \text{ CI} [-.00, .02]$; compatible identities: $m^{\text{dif}} = .00, t(31) = .56, p = .58, 95\% \text{ CI} [-.00, .01]$; incompatible identities: $m^{\text{dif}} = .00, t(31) = .55, p = .58, 95\% \text{ CI} [-.01, .01]$).

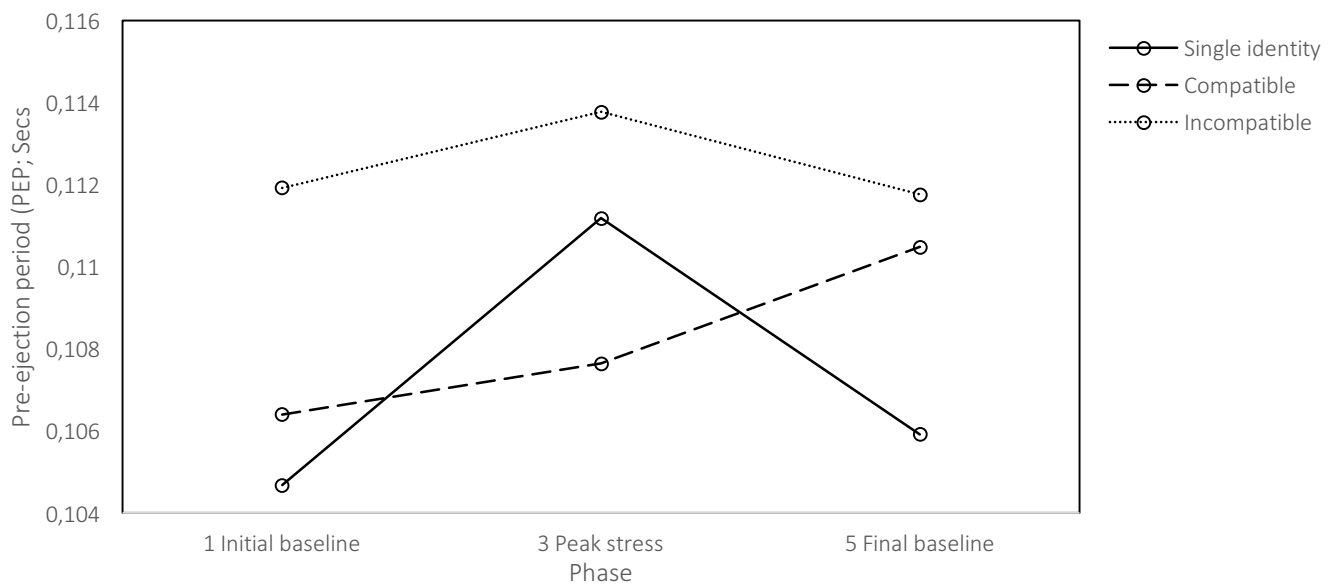


Figure 5.11 Pre-ejection period (PEP) reactivity and recovery by condition.

Respiratory sinus arrhythmia (RSA): There was no significant effect of condition on RSA reactivity ($F(2, 93) = 2.419, p = .12, \eta_p^2 = .05$). Thus, there were no between-condition differences in stressor RSA reactivity.

Looking at within-condition RSA reactivity scores compared against baseline, we found a significant difference for people focusing on a single identity. These people decreased in RSA in response to the stressor ($m^{\text{dif}} = -.00, t(30) = -2.01, p = .05, 95\% \text{ CI } [-.00, .00]$) before recovering to their baseline ($m^{\text{dif}} = .00, t(29) = 1.57, p = .13, 95\% \text{ CI } [.00, .00]$). While the compatible increased in RSA during the stressor, this change was non-significant ($m^{\text{dif}} = .00, t(31) = 1.22, p = .23, 95\% \text{ CI } [-.00, .00]$). People with incompatible identities activated hardly changed in RSA reactivity during the stressor: $m^{\text{dif}} = .00, t(30) = .20, p = .85, 95\% \text{ CI } [-.00, .00]$ (see Figure 5.12). Thus, people reflecting on a single identity reacted to the stressor with RSA markers consistent with the experience of stress and anxiety. While RSA reactivity in the other two conditions was non-significant, the general pattern for people focusing on compatible identities is worth noting. Here, participants increased in

RSA in response to the stressor, thus displaying RSA reactivity indicative of the experience of calm and focus – a response consistent with the experience of calm and focus.

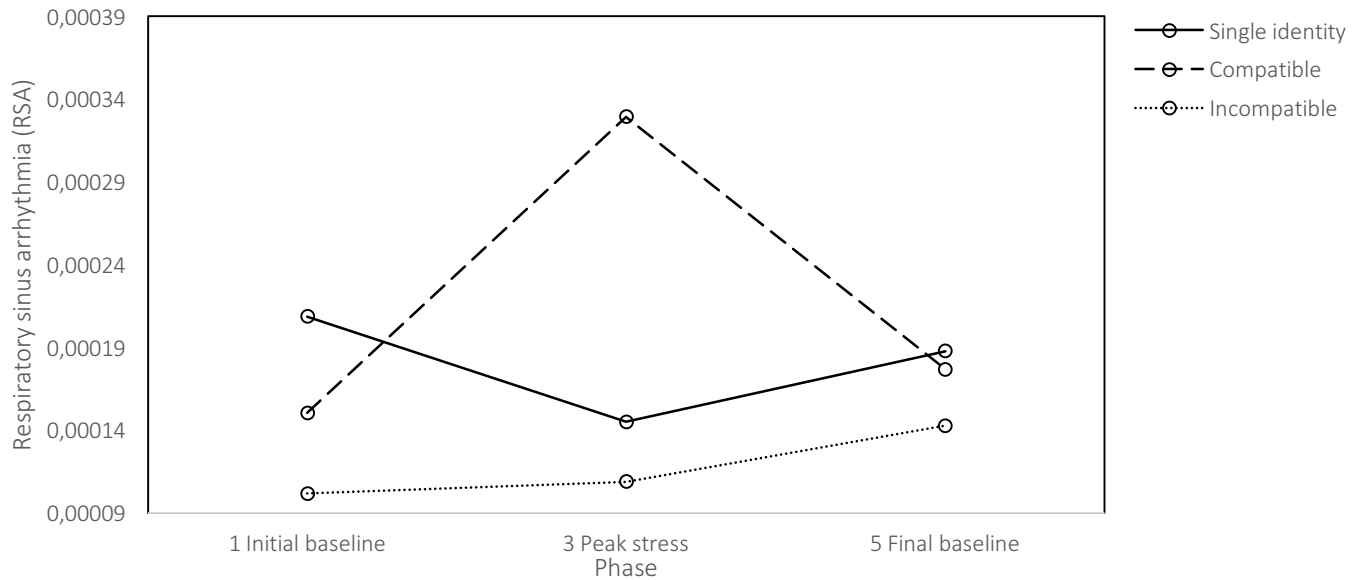


Figure 5.12 Respiratory sinus arrhythmia (RSA) reactivity and recovery by condition.

In sum, and similar to the reactivity scores analysis from Study 4, these results are somewhat inconclusive. We found no effects of condition on any of the outcome variables, including the TCI. Further, there were no statistically significant within-condition effects on PEP or TPR. However, we did find several significant within-condition changes in reactivity in CO and RSA. Specifically, people reflecting on a single identity decreased in RSA in response to the stressor, indicating stress and anxiety. People focusing on multiple compatible identities, on the other hand, increased (non-significantly) in RSA as they approached the stressor, indicative of calm and focus. The incompatible identities condition (condition 3) stayed relatively level throughout the experiment. Thus, while there is only a single significant effect in the RSA data, the overall pattern suggests tentative support for our hypotheses.

In terms of CO, all conditions responded to the stressor with significant increases. However, all but the single identity condition (condition 1) recovered to their initial baseline. These results thus indicate challenge orientation in all three conditions, with better recovery in people focusing on multiple compatible or incompatible identities (conditions 2 and 3).

Finally, although there were no significant findings in terms of TPR, the general pattern is noteworthy. Here, people reflecting on a single identity or three compatible identities, responded to the stressor with slight decreases in TPR, consistent with perceptions of challenge. People with multiple incompatible identities activated, however, decreased in TPR – a response indicative of threat orientation.

Exploratory analysis of variance

The mean scores on each physiological outcome variable for participants in each phase of the experiment are reported in Table 5.4. Similar to Study 4, we chose to explore the data further, and test the between and within condition effects at each of the five phases of the experiment. To ascertain any differences between and within Conditions, 3 (condition) x 5 (time) mixed analyses of variance with repeated measures on the second factor were performed. The following results relate to cardiac output (CO), respiratory sinus arrhythmia (RSA), total peripheral resistance (TPR), and pre-ejection period (PEP).

Cardiac output (CO): There was no significant between-participants main effect for CO, $F(2, 92) = .89, p = .41, \eta_p^2 = .02$. There was, however, a significant within-participants main effect for time, $F(1, 92) = 22.40, p < .001, \eta_p^2 = .01$. Specifically, participants increased significantly in CO from Phase 1 to Phase 2 ($m^{\text{dif}} = .28, p < .001, 95\% \text{ CI } [.16, .29]$) and from Phase 2 to 3 ($m^{\text{dif}} = .11, p = .02$,

95% CI [.02, .20]). CO then decreased significantly during Phase 4 ($m^{\text{dif}} = -.11, p < .001, 95\% \text{ CI } [-.18, -.04]$) and Phase 5 ($m^{\text{dif}} = -.23, p < .001, 95\% \text{ CI } [-.31, -.16]$). Participants thus reacted to *identity activation* (Phase 2) with increased CO, and again to *stress peak* (Phase 3), before returning to their initial baseline level during the *post stress* and *final baseline* (Phases 4 and 5).

There was also a significant interaction between time and condition for CO, $F(2, 92) = 2.16, p = .03, \eta_p^2 = .00$ (see Figure 5.13). Decomposing the interaction, we found that participants in Condition 1 (single identity) increased significantly in CO during Phase 2 ($m^{\text{dif}} = .33, p < .001, 95\% \text{ CI } [.20, .45]$), and then levelled off in Phases 3 and 4. Participant CO then dropped significantly during Phase 5 ($m^{\text{dif}} = -.16, p = .02, 95\% \text{ CI } [-.29, -.03]$). This final decrease was still significantly higher than their initial baseline in Phase 1, indicating an incomplete recovery ($m^{\text{dif}} = .21, p < .001, 95\% \text{ CI } [.06, .37]$). By contrast, people in Condition 2 (compatible) increased marginally significantly in CO during phase 2 ($m^{\text{dif}} = .11, p = .08, 95\% \text{ CI } [-.01, .24]$) and significantly during Phase 3 ($m^{\text{dif}} = .15, p = .05, 95\% \text{ CI } [-.00, .30]$), before decreasing significantly during Phase 4 ($m^{\text{dif}} = -.17, p < .001, 95\% \text{ CI } [-.29, -.06]$) and 5 ($m^{\text{dif}} = -.26, p < .001, 95\% \text{ CI } [-.39, -.13]$). Further, for these people, CO during Phase 5 was significantly lower than the initial Phase 1 baseline ($m^{\text{dif}} = -.17, p = .03, 95\% \text{ CI } [-.33, -.01]$). In Condition 3 (incompatible), participant CO increased significantly during Phase 2 ($m^{\text{dif}} = .21, p < .001, 95\% \text{ CI } [.09, .34]$) and again marginally in phase 3 ($m^{\text{dif}} = .15, p = .07, 95\% \text{ CI } [-.01, .30]$), before decreasing significantly during Phase 4 ($m^{\text{dif}} = -.16, p = .01, 95\% \text{ CI } [-.27, -.04]$), and finally recovering to their initial baseline in Phase 5 ($m^{\text{dif}} = -.28, p < .001, 95\% \text{ CI } [-.41, -.15]$).

Thus, all participants approached *identity activation* (phase 2) with increased CO (marginal for compatible condition). Participants with compatible identities activated increased significantly in response to *stress peak* (phase 3) while the CO of people focusing on incompatible identities

attenuated with only a slight increase (marginally significant). People with a single identity levelled off completely during *stress peak*. In terms of recovery, during the final two phases there was further variation. By the end of the experiment, people with incompatible identities activated had made a complete recovery to their initial baseline. People focusing on multiple compatible identities, however, not only recovered completely, but finished the final phase with lower CO levels than during their initial Phase 1 baseline. People reflecting on a single identity never recovered to their initial baseline.

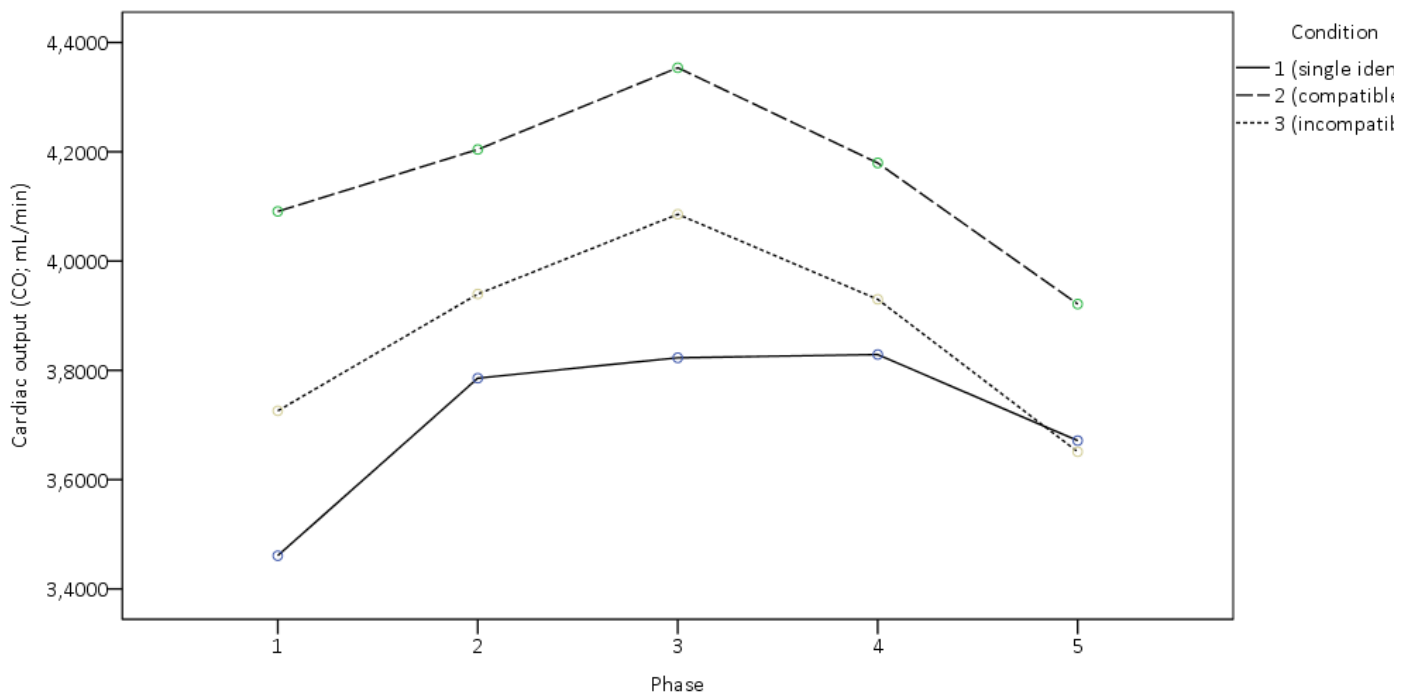


Figure 5.13 Mean cardiac output (CO) by condition across study phases.

Total peripheral resistance (TPR): There were no between condition, $F(2, 92) = 1.09, p = .34, \eta_p^2 = .02$, or within condition, $F(2, 92) = .44, p = .77, \eta_p^2 = .00$, main effects for TPR, and no significant interaction between time and condition, $F(2, 92) = .33, p = .95, \eta_p^2 = .00$. Examining the within condition estimated marginal means, however, revealed some interesting tendencies. In

particular, people in Condition 3 (incompatible) experienced higher TPR during Phase 3 than Phase 4 ($m^{dif} = 188.70, p = .15, 95\% \text{ CI } [-448.41, 71.00]$).

Although there was no statistically significant fluctuation in TPR across time, the general pattern throughout the experiment is noteworthy. People focusing on compatible identities experienced a drop in TPR during the stressor, consistent with challenge perception (i.e., decreased TPR; see Figure 5.14). People reflecting on a single identity and multiple incompatible identities, however, responded to the stressor in a fashion consistent with threat perception (i.e. increased TPR; see Figure 5.14). Indeed, the incompatible condition exhibited the most dramatic within-condition fluctuation with a particular increase during the stressor phase (Phase 3) ($m^{dif} = 188.70, p = .15, 95\% \text{ CI } [-448.41, 71.00]$). Overall, the emerging pattern is consistent with a threat response to the stressor (Phase 3) for people reflecting on a single identity and multiple incompatible identities. By contrast, people thinking of multiple compatible identities appear to perceive the stressor as a challenge.

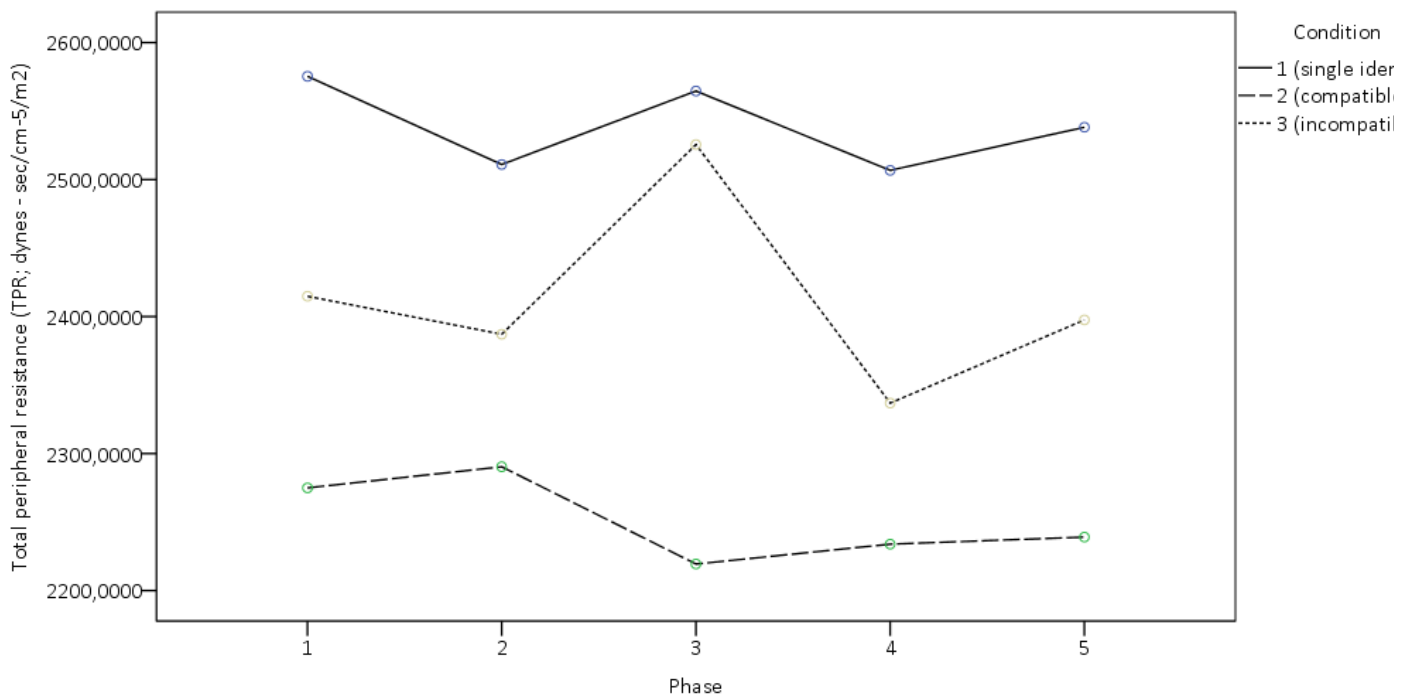


Figure 5.14 Total peripheral resistance (TPR) by condition across study phases.

Pre-ejection period (PEP): For PEP there was no between-participants main effect, $F(2, 92) = .48, p = .62, \eta_p^2 = .01$. There was, however, a within-participants main effect for time, $F(1, 92) = 4.62, p < .001, \eta_p^2 = .02$. There was no variation in PEP across the first three phases, however PEP decreased significantly during Phase 4 ($m^{\text{dif}} = -.007, p < .001, 95\% \text{ CI } [-.01, -.00]$) only to increase again significantly during Phase 5 ($m^{\text{dif}} = .006, p < .001, 95\% \text{ CI } [.00, .01]$).

While there was no statistically significant interaction effect for time and condition, $F(1, 92) = 1.06, p = .38, \eta_p^2 = .01$ we found several significant patterns that varied across conditions. People in Condition 1 (single identity) increased slightly in PEP between Phases 1 and 2, and 2 and 3. While both of these individual increases were non-significant, the increase from Phase 1 to 3 was marginally significant ($m^{\text{dif}} = .01, p = .07, 95\% \text{ CI } [-.00, .01]$). Participants then decreased significantly during Phase 4 ($m^{\text{dif}} = -.01, p = .01, 95\% \text{ CI } [-.02, -.00]$). Finally, they increased significantly during Phase 5 ($m^{\text{dif}} = .01, p = .01, 95\% \text{ CI } [.00, .01]$), returning to their initial baseline. In contrast, people in condition 2 (compatible) increased marginally significantly in PEP in response to Phase 2 ($m^{\text{dif}} = .00, p = .06, 95\% \text{ CI } [-.00, .01]$) before decreasing slightly and non-significantly during Phase 3 and then further in Phase 4. This decrease during Phase 4 was non-significant when compared against the preceding phase (3) ($m^{\text{dif}} = -.01, p = .32, 95\% \text{ CI } [-.01, .00]$). However, the decline was significant when compared against Phase 2 ($m^{\text{dif}} = -.01, p = .01, 95\% \text{ CI } [-.01, -.00]$). Finally, participants increased significantly in PEP during Phase 5 ($m^{\text{dif}} = .01, p < .001, 95\% \text{ CI } [.00, .01]$). This final increase significantly overshoot their initial baseline during Phase 1 ($m^{\text{dif}} = .00, p = .01, 95\% \text{ CI } [.00, .01]$). Participant PEP in Condition 3 (incompatible) experienced a non-significant decrease during Phase 2, followed by a slight and non-significant increase in response to Phase 3. They then decreased further, but non-significantly during Phase 4, before experiencing a significant increase in

PEP during Phase 5 ($m^{\text{dif}} = .01, p = .02, 95\% \text{ CI } [.00, .01]$) (see Figure 5.8), returning to their initial baseline (see Figure 5.15).

Thus, people focusing on a single identity reacted to the experiment in a comparable manner to those focusing on multiple incompatible identities. Both conditions recorded increases in PEP during the stressor (Phase 3). While this reaction was non-significant for people reflecting on incompatible identities and only marginally significant for those thinking of a single identity, the pattern across these two groups is nonetheless consistent. On the other hand, people with multiple compatible identities activated experienced the opposite with a significant decrease in PEP between *identity activation, stress peak (non-significant), and post stress* – a pattern indicative of perceiving the task as a challenge rather than a threat.

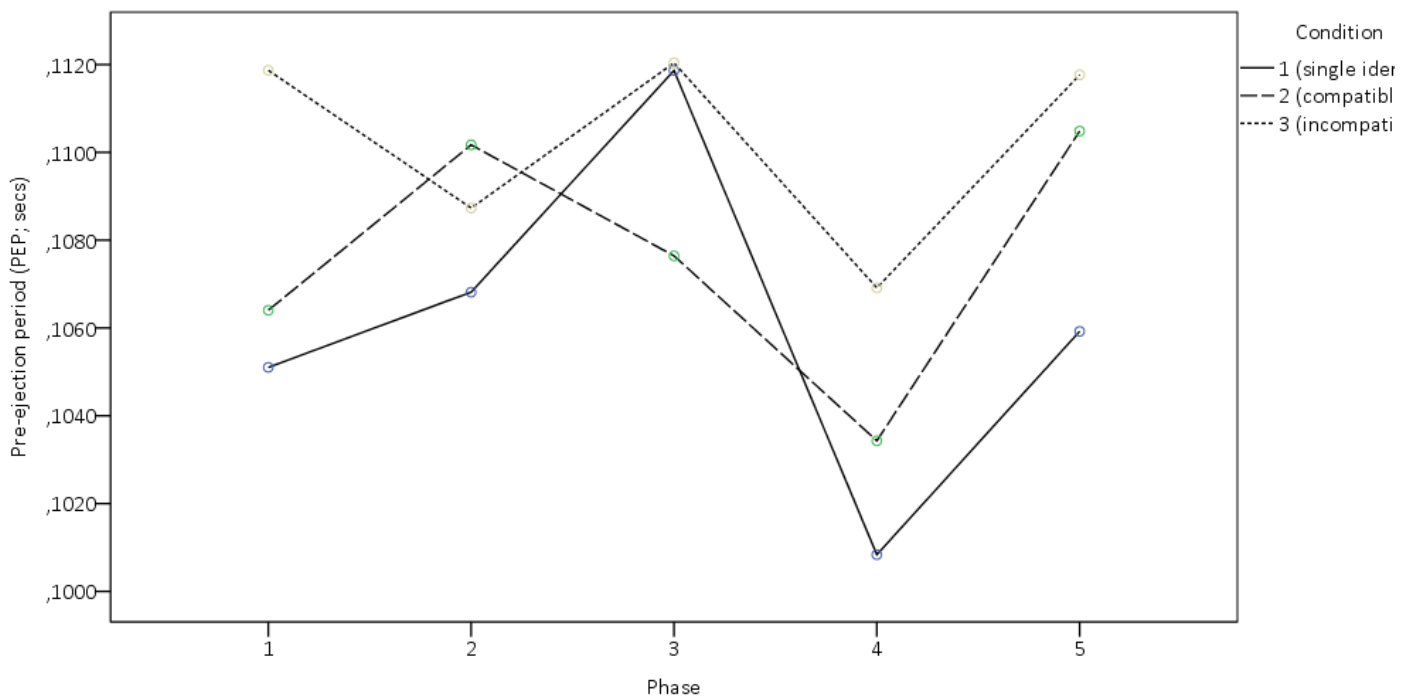


Figure 5.15 Pre-ejection period (PEP) by condition across study phases.

Respiratory sinus arrhythmia (RSA): For RSA there was no between-participants main effect, $F(2, 87) = .92, p = .40, \eta_p^2 = .02$. There was, however, a significant main effect for time, $F(1, 87) = 9.25, p < .001, \eta_p^2 = .01$. Participant RSA decreased non-significantly in response to Phase 2 and

then increased slightly and non-significantly during Phases 3 and 4, before decreasing again significantly during Phase 5 ($m^{\text{dif}} = .000050$, $p = .04$, 95% CI [-.000098, -.000003]), ultimately returning to their baseline. Although largely non-significant, the RSA pattern indicated that participants responded to the stressor with RSA markers consistent with the experience of focus and calm, only to level out over the next two phases, ultimately returning to their baseline.

There was a marginally significant interaction effect for time and condition, $F(2, 87) = 2.55$, $p = .08$, $\eta_p^2 = .04$ (see Figure 5.6). To test the hypotheses directly, we looked at specific patterns within conditions and found several significant effects. For people in Condition 1 (single identity), RSA decreased non-significantly from Phase 1 to Phase 2 and from Phase 2 to 3. There was a slight and non-significant increase in Phase 4 before a significant drop in RSA during phase 5 ($m^{\text{dif}} = .000095$, $p = .02$, 95% CI [-.000178, -.000013]), recovering to the initial baseline (see figure 5.14). Similarly, people in Condition 2 (compatible) experienced an initial non-significant decrease in RSA in response to Phase 2, which was then followed by a significant increase during Phase 3 ($m^{\text{dif}} = .000266$, $p = .02$, 95% CI [.000054, .000478]). Participants then decreased slightly and non-significantly during Phase 4 and Phase 5, recovering to baseline (see figure 5.16). Finally, people in Condition 3 (incompatible) experienced only a single marginally significant increase in RSA between Phases 2 and 4 ($m^{\text{dif}} = .000081$, $p = .09$, 95% CI [-.000014, .000176]), remaining relatively level throughout the experiment.

Thus, people focusing on multiple compatible identities responded to the stressor with focus and calmness as indicated by increased RSA. People focusing on a single identity reacted (though non-significantly) to the stressor in a way consistent with the experience of stress and then gradually recovered during *post-stress*. Finally, people focusing on multiple incompatible identities

did not react at all to the stressor, and experienced only a slight, marginally significant increase in RSA during the stressor and post-stress periods (Phase 4).

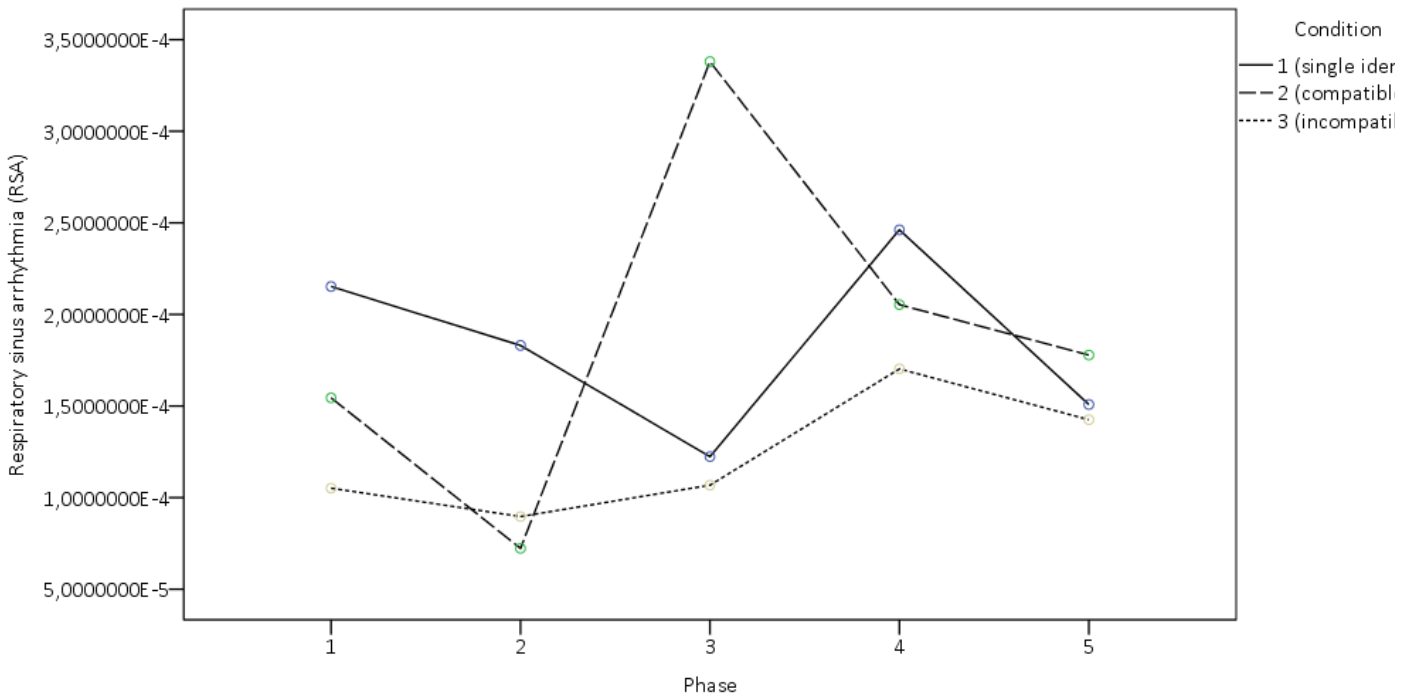


Figure 5.16 Respiratory sinus arrhythmia (RSA) by condition across study phases.

Similar to Study 4, our two methods of analysis generated similar results. However, due to the exclusion of phase 2 and 4 in the reactivity scores analysis these results were again somewhat hazy. Looking at the data in its entirety through use of repeated measures analysis of all five time-points, however, enabled a more complete picture of the data. Thus, adding *Identity activation* (phase 2) as an extra baseline, and *Post-stress* (phase 4) as a supplementary measure of recovery, helped tease out the trajectories between all five phases, providing a slightly clearer view of the relationships between and within condition.

Discussion

We predicted that people with multiple compatible identities activated would cope with stress in an adaptive manner and perceive the experimental task as a challenge rather than a threat. We also anticipated that people with multiple incompatible identities activated or a single identity activated would not cope with stress as well and tend to perceive the task as a threat rather than a challenge. Finally, we expected people focusing on multiple compatible identities would recover from the stress more efficiently than people in the other two conditions. The overall pattern from this experiment is generally consistent with these hypotheses. The results on our main outcome variables indicate a tendency for people with a single identity or multiple incompatible identities activated to approach the stressor with physiological responses consistent with threat orientation (increased TPR and PEP; non-significant) and stress (decreased RSA in the single-identity condition). While there was only a single marginally significant such effect (on PEP for the single-identity condition), the contrast in physiological responses to the stressor between people in these two conditions and people in the compatible condition is nonetheless noteworthy. Participants focusing on compatible identities rose to the occasion as they dealt with the stressor with calm and focus, and seemed to perceive the task more as a challenge than a threat. This tendency was statistically significant on CO, PEP and RSA and while statistically non-significant on TPR, people in the compatible condition still decreased (challenge) in response to the stressor as people in the other two conditions increased (threat). While these results are somewhat hazy and consistent statistically significant results are generally lacking, the patterns in concert do suggest greater resourcefulness and resilience in the face of adversity among people for whom multiple compatible identities were activated compared to those with multiple incompatible identities or a single

identity. In the context of this suggestive evidence, further, higher powered, and more refined tests of this idea would seem fruitful.

Thus, we provide further evidence for the notion that access to more identities in the self-concept, as opposed to fewer identities, is largely a good thing. Identities, and the groups to which they are attached, seem to comprise a resource from which the individual can draw strength and resilience when under pressure and facilitate recovery from the associated stress. However, we also provide nuance to this picture by showing that incompatibility between the identities that are active within the self-concept can disrupt the resources that otherwise flow from multiple group membership. As such, it seems that the sheer quantity of the individual's multiple identities *as well as* the way that these identities are understood and defined by the self and others (in terms of compatibility) contribute to resilience in the face of adversity. In other words, and consistent with past research, identity compatibility seems to moderate the relationship between multiple group membership and resilience.

General discussion

Our ability to cope with life's stressors may at least in part depend on the features of the groups to which we belong. In the two experimental studies outlined above, we have provided novel empirical support for the idea that multiple group membership affects the way that we approach a difficult situation and recover from the associated stress. Specifically, the results of Study 4 generally supported the notion that multiple group memberships enhanced people's ability to constructively deal with and recover from the stress of solving a challenging mental puzzle on the clock. Further, in Study 5 we elaborated on these findings and provided support for the idea that

the benefits of multiple group membership are not entirely due to the *number* of identities, but also depend on their perceived compatibility between component identities.

These findings align well with our previous studies (Chapter 4) as well as with past research that has linked multiple group membership with a variety of well-being outcomes (Binning et al., 2009; C. Haslam et al., 2008; Iyer et al., 2009). However, the reason why multiple and compatible group memberships facilitate more adaptive stress reactions and recovery are the subject of some debate. As mentioned in the introduction to this chapter as well as in Chapter 2, past research has suggested that multiple group membership provides a psychological *buffer*, protecting the individual from the adverse well-being effects of a range of stressors and challenges (Mussweiler et al., 2000; Roccas & Brewer, 2002; Thoits, 1983). That is, in contrast to a self-concept held together by only a single group membership (such as participants in Condition 1 in our studies), one that comprises a broad range of identities may be better equipped to absorb any devalue or threat and thus protect the self (Linville, 1987; Mussweiler et al., 2000; Roccas & Brewer, 2002).

Echoing our findings from Study 3, however, the results of Study 5 indicate that identity incompatibility complicates matters. That is, when identities conflict in terms of meaning and content, the resulting sense of inconsistency in the self-concept disrupts the resources otherwise afforded by multiple group memberships. Indeed, it appears that incompatible group memberships may be sufficiently difficult for the individual to balance and negotiate to have downstream consequences for their physiological responses to stress. Incompatibility may make the benefits of multiple group memberships (including, e.g., buffer effects) more problematic to access, and ultimately may leave the self-concept fragmented, conflicted and vulnerable. Alternately, if one's

multiple group memberships are harmonious and well-integrated, they may represent an inclusive, cohesive and streamlined source of broad support, and in turn, strength and resilience.

In this way, the specific features of group memberships appear to regulate the extent to which they alone or in combination affect the individual's ability to cope. Thus, whereas much current literature has emphasized the straightforward importance of multiple group memberships for improved individual functioning, our research highlights the significance of the socially determined content and meaning of the associated identities as they combine in the self-concept.

While these results are interesting and do appear to support the hypotheses we formulated for this research, it should nonetheless be noted that they are somewhat weak. That is, as touched upon previously, several of the outcomes outlined in Studies 4 and 5 do not reach statistical significance, thus affording only a rather hazy picture of the studied relationships, and limiting any conclusions about these to terms of tendencies and patterns rather than cause and effect. On one hand, these outcomes may indicate that the effects of multiple group memberships do not facilitate individual resilience against psychological stress as much as they do other well-being effects (Jetten et al., 2012). On the other hand, however, the lack of clear and significant results in our studies could also signify problems with our research design. For example, our activation of group memberships in participants may have been too weak to make the associated identities properly salient, obscuring their presumed protective effects against stress. Similarly, our manipulation of identity compatibility in Study 5 comprised only a few sentences that may not have created a sense of internal conflict in individuals sufficient for consistent detection at a physiological level. Indeed, while participants in the incompatible condition perceived their identities as less compatible than participants in the compatible condition, they still viewed their identities as generally well-fitting,

with a mean compatibility rating of 4.13 on a 5-point scale. Future research should address these possibilities by devising stronger identity manipulations that more explicitly bring participants' identities, and the meaning of the combination of these, to the front of their minds.

Conclusion

Multiple group membership enhances our ability to deal with the everyday stress we encounter in life: The more ways in which we can define ourselves, the better off we are in terms of psychological resilience and coping. This effect may be the result of the protective buffer afforded by a self-concept comprising multiple identities as opposed to a singular self-definition. However, multiple group memberships need to be perceived as compatible by the individual to unlock such psychologically, and physically, valuable effects. If the groups to which we belong – or through which we are currently perceiving the self – are in conflict with each other, the benefits associated with membership in these groups can be obstructed. As such, the well-being benefits of group membership are not a question of *number* alone. For group memberships to combine in ways that are psychologically functional, questions of identity value and meaning, and the manner in which multiple identities become integrated in the self-concept as compatible or not, are equally important.

Chapter 6

General discussion

We live in an ever more multifaceted social environment. In response to increased social and cultural diversity, the identities that we inhabit and the group memberships that we integrate into our overall self-concepts continue to become more numerous and intricate. This identity complexity may manifest itself in terms of both the descriptive boundaries of group membership as well as by the specific content value and expectations placed on these groups by the individual and broader society. These group and identity characteristics inform individual behaviour, social connection and self-expression. While complexity of the self has been associated with many benefits (e.g. more positive intergroup orientations, improved individual well-being and resilience) past research has tended to explain these effects in terms of the sheer number of group memberships alone. This view, however, does not account for the way that groups are integrated in the self-concept or the perception and meaning of these groups to the individual and broader society.

In light of these shortcomings in the literature, we set out to investigate the particular features of multiple group memberships that determine their effects on individual well-being as well as the mechanisms that might enable these. Specifically, the theoretical basis for this thesis takes root in the questions of *when* and *how* multiple group memberships and their associated identities contribute to individual well-being. In other words, we questioned whether it is the sheer number of identities held in the self-concept that is the central contributing factor to well-being, or whether other elements of identity – for example their combination in the self-concept or the value

attributed to them by society – also play a role in this link. In our attempt to answer these questions, the research presented above was guided by three main predictions grounded in the relevant literature on group membership and well-being. First, we proposed that multiple group memberships contribute to well-being, but only to the extent that they represent clear and distinct sources of support and identity for the individual. To test this expectation, we drew primarily on the ideas of identity overlap suggested in social identity complexity (SIC) theory. Second, we argued that the content and socially defined meaning attributed to particular groups in society could complicate the individual's access to the benefits (e.g. social support and inclusion) of multiple other group memberships, and in this way inhibit well-being. Here, we referred to the literature on the repercussions of identity stigma and devaluation. Finally, we reasoned that the self-concept might fragment and detract from the well-being effects of multiple group memberships if these groups are perceived by the self and others as conflicting in nature. The literature on identity compatibility informed our main ideas and hypotheses in this area. The following sections of this final chapter will summarize the results of the research presented above before delving into the theoretical implications of these findings as well as a discussion of limitations and directions for future research.

Summary of results

Across the five studies contained in the previous chapters, we have attempted to gain a deeper understanding of the relationship between multiple group membership and individual well-being and resilience. At the most fundamental level, our results provide compelling evidence for the notion that the specific features of group memberships, as well as the combination of the

associated identities in the self-concept, are at least as important for these outcomes as the sheer number of groups to which an individual belongs. More specifically, we have shown that the complexity of an individual's group memberships and associated identities shapes their well-being consequences by virtue of their perceived distinctiveness and boundaries, value and compatibility. In Study 1, we found that perceiving overlap in membership between one's multiple groups inhibited their effects on well-being. Conversely, membership in multiple distinctive groups facilitated individual well-being. The results for Study 2 elaborated on these findings by reframing the research question from being one of (individual) perceived distinctiveness to one of social meaning and value of group memberships. The findings of this study demonstrated that belonging to visibly stigmatized groups detracted from the impact of multiple groups on well-being. Importantly, across both Studies 1 and 2, the effects of group membership on well-being were explained, at least in part, by perceived access to social support and perceived freedom of identity expression. Thus, although different features of groups – distinctiveness and stigma – are implicated in the link between multiple group membership and well-being, the processes through which these factors exert their influence seem to be common. Study 2 revealed additional mediating processes in the form of identity compatibility and social inclusion.

While Studies 1 and 2 were correlational in design, and therefore prevented any conclusions with respect to cause and effect, they nonetheless provided the grounds on which to argue that the contribution of multiple group memberships to well-being are contingent on not only their individual meaning, but also their combination in the self-concept. In Chapter 4, we took this idea a step further and experimentally tested the effect of identity compatibility on individual well-being (Study 3). We included psychological resilience as an additional outcome measure. The results of this study indicated that multiple identities contributed to well-being and resilience, but only when

they were manipulated to be compatible in content. When group memberships were framed as incompatible, they undermined well-being and resilience. In so doing, these findings further underscore the role of compatibility in determining the consequences of multiple group memberships. Again, dovetailing with Studies 1 and 2, the effects of multiple (in)compatible groups on well-being and resilience were carried through perceived social support and ease of self-expression.

Finally, in Chapter 5 we elaborated on these findings, by conducting another two experiments assessing the moderating role of identity compatibility on the benefits of multiple group memberships (Studies 4 and 5). In order to delve deeper into the apparent benefits of multiple groups for resilience and well-being, in these studies we examined physiological reactions to, and recovery from, experienced psychological stress. In this context, our findings provided indicative evidence that the benefits of multiple group memberships are contingent on the extent to which an individual perceives these groups and the associated identities as compatible or not. Specifically, it would seem that multiple compatible groups facilitate resilience whereas multiple incompatible groups do not.

In sum, these five studies highlight a number of features of group memberships, and their associated identities, that are relevant for understanding previous demonstrations of the psychological and physical benefits of multiple group membership. First, the descriptive characteristics of multiple identities, in terms of the degree of membership overlap, seem to moderate the individual's access to the benefits of the full range of group memberships. Similarly, the value attached to these identities in the broader social context (e.g., stigma), as well as the degree to which these are easily combined in the individual's overall self-concept (i.e., in terms of

compatibility), determines the well-being effects of multiple group memberships for the individual. Our results indicate that these effects occur due the advantages of a complex and coherent self-concept comprising many positive and compatible, disparate and clear avenues through which to express oneself clearly, and gain support and inclusion from similar others. Thus, by providing evidence underlining the importance of these specific characteristics of multiple group memberships, our findings contribute to an improved understanding of exactly how and when belonging to multiple groups is (positively) complex, rather than (negatively) complicated.

In the next section, we explore the theoretical implications of these findings. In order to do this, we examine the results in greater detail and discuss them in the context of the literature reviewed in the introductory chapters of this thesis. We concentrate on the particular ways that our results contribute to, and extend, the relatively limited knowledge on the general effects that multiple group memberships have on well-being, as well as the mechanisms and processes through which these effects occur.

Theoretical and practical implications

Theoretical implications for work on social identity complexity. To our knowledge, Study 1 is the first research to empirically examine the importance of social identity complexity (SIC) for individual well-being, rather than for broader social outcomes. In Chapter 2, we argued that in addition to blurring intergroup boundaries – the traditional focus of research in this framework – high SIC was relevant for understanding individual access to the material and psychological benefits of multiple group memberships. Referring in particular to the research suggesting that group membership facilitates connection with, and support from, similar others (Jetten et al., 2012), we

hypothesized that for such an effect to accrue proportionately to the individual's number of group memberships, these groups and their associated identities would have to be distinct rather than overlapping. That is, each group would have to represent a discrete point of identification, and through this, access to separate benefits. Our results generally support these ideas. Specifically, by examining the effects of multiple group memberships within a SIC framework, we found that while people may define themselves in terms of a broad range of social identities, these only contribute to individual overall well-being if they are crystallized and clear within the self-concept. If group memberships substantially overlap, however, multiple group boundaries may become muddled and fuzzy, making it harder for the individual to express the self and connect with similar others. Consistent with this, in the context of low SIC (i.e., high overlap), we found that fewer identities were actually beneficial – presumably because as identities overlap, few as opposed to many may be simpler to enact and negotiate, and easier to combine in the self-concept. In other words, in addition to qualifying the previously observed positive relationship between multiple identities and well-being, our results also suggest that multiple identities may occasionally be a burden for the individual, while relatively few may sometimes represent a greater resource (i.e., in the context of high overlap).

Overall, these findings are interesting and novel. By highlighting the importance of the particular facets of multiple group memberships that either unlock or place limits on their potential benefits, our results contribute to a more thorough understanding of the dynamics and processes through which multiple group memberships and the associated identities affect individual well-being. Principally, these findings stress the significance of the descriptive characteristics of group memberships (i.e., their membership boundaries) that define the configuration of the associated identities in the self-concept and structure the effects of well-being on the self – effectively

regulating the extent to which they represent a resource or a burden for the individual. In addition to adding nuance to the previously documented positive relationship between multiple group memberships and well-being, our results also speak to the mechanisms that facilitate this connection, by explaining these effects in terms of identity expression and perceived social support.

Theoretical implications for research on identity value and compatibility. In addition to questions about social identity complexity and overlap, we considered stigmatization as a factor that was likely to shape the effects of multiple group memberships on the self. A considerable body of work suggests that membership in groups that are devalued, stigmatized, or the targets of prejudice and discrimination, carries psychological costs (Schmitt et al., 2014). Moreover, there is a long tradition within the stigma literature of considering the unique burdens, and opportunities, afforded by stigmatized identities that are visible versus invisible or concealable (Goffman, 1963). While there is past research on the way in which belonging to obvious and concealable stigmatized groups impacts on well-being (Ellemers & Barreto, 2006; Feinstein, Davila, & Yoneda, 2012), to our knowledge, none of this research explicitly considers this in the context of multiple group memberships. Drawing on the relevant literature, we reasoned that the value attributed to one's identities by the individual and broader society, would determine the extent to which multiple group memberships contributed to well-being. In line with our expectations, we found that multiple group memberships represented a resource for the individual when the associated identities were either positive and visible, or stigmatized and invisible. If stigmatized identities were visible, multiple group memberships detracted from well-being, whereas belonging to relatively few groups under these conditions seemed to facilitate well-being.

As outlined in Chapter 2, the understanding of multiple group membership has developed with relatively little reference to ideas of identity value and stigma. Our results extend past research by showing that in certain circumstances the particular meaning with which identities are imbued by the broader social context affects individual well-being above and beyond the sheer number of identities in the self-concept. Consistent with the ideas of a multi-faceted self, buffering against, for example, stereotype threat (Cohen & Wills, 1985; Linville, 1987; Thoits, 1983), we found that multiple group memberships did appear to protect against the negative effects of stigma, at least when the stigma was concealable. A self-concept comprising many unmarked identities may afford the individual opportunities for self-expression as well as social support and inclusion in spite of any devaluation attached to a given identity. On the other hand, however, belonging to a visibly stigmatized group appeared to neutralize any such protective effect of multiple identities. Explaining this outcome, we argue that obviously stigmatized identities cast a shadow on the other components of the individual's self-concept by persistently featuring at the fore of any social interaction, thus defining the individual by the stigma alone (Goffman, 1963). This would, we presume, complicate the various avenues of self-expression, social support and inclusion (and in turn well-being), afforded by the individual's multiple other identities.

In addition to the implications of visibly stigmatized identities, we also considered the notion that when combined with other neutral or valued identities in the self-concept, stigmatized identities may give rise to feelings of conflict. Thus, the final argument made in Chapter 2 proposed the idea that the perceived compatibility of the individual's multiple groups would moderate their effects on well-being by complicating access to their benefits. The correlational findings from Study 2, combined with the experimental results from Studies 3 and 5 indicate that this may indeed be the case. Taken together, these studies suggest that the experience of incompatibility decreases

both general well-being as well as psychological resilience in the face of adversity, and does so by interfering with social support and identity expression. We argue that if the social meaning and expectations associated with membership in various groups conflict (e.g., due to stigma), then this may complicate self-expression and block access to support, weakening any buffer effects and ultimately decreasing well-being and resilience. By contrast, if one's multiple group memberships are compatible and unified, they may represent a cohesive and streamlined source of broad support, and in turn, strength and resilience.

Interestingly, however, we also found that *fewer* identities were beneficial in terms of compatibility for individuals who belong to visibly stigmatized groups. Consistent with past research indicating the protective effects of identifying strongly with a stigmatized group (Friblet et al., 1998), we propose that membership in few and discernibly devalued categories limits the individual's options for self-definition and encourages openness and self-acceptance around his or her stigma. This may, in turn, simplify the process of fusing the self-concept and reaching out and connecting with similar others for support and inclusion. This analysis, however, remains speculative and invites further research. Thus, complementing the findings from Study 1, we restate – albeit from different angles of stigma and compatibility – that multiple group memberships do not always contribute to well-being, and that sometimes belonging to few rather than many groups is relatively beneficial (e.g., in the context of visible stigma). Specifically, we have shown that while multiplicity of the self may sometimes protect the individual from the harmful effects of stigma and incompatibility (i.e., if the stigma is invisible), they may at other times be detrimental (if they are visibly stigmatized or incompatible).

Practical implications: While the reported studies may principally contribute at a theoretical level by fleshing out and refining the knowledge on the connection between multiple group membership and individual well-being outcomes, there are still considerable applied value in this research. In recent years, a focus on a social cure has featured heavily in social identity research (Jetten, et al., 2011). Here, the main idea is that by acknowledging the impact that social identity and group membership has on various forms of individual well-being, and by understanding the specific mechanisms that underpin this effect, researchers will be able to use this knowledge to inform and design social health interventions. Several past studies have shown how the development of new group memberships have provided the basis for effective intervention and care for people recovering from traumatic brain injuries (Douglas, Dyson, & Foreman, 2006), or who are at risk of loneliness and depression (Haslam et al., 2011). For example, Douglas et al. (2006) found that people who had sustained a traumatic brain injury (TBI) typically experienced a severe social burden associated with the injury and its psychological and physical aftermath. However, those TBI patients who participated in various leisure and community activities over the course of a six-month trial, showed promising improvements in their social integration, mental functioning, and overall health. These positive outcomes were attributed to the increased social support and inclusion that followed from encouraged group membership.

Similarly, Haslam, Cruwys, Haslam, Dingle, and Chang (2016) investigated the effects of an intervention – Groups 4 Health (G4H) – targeting young adults affected by social isolation and emotional disturbances. The G4H intervention specifically examined the effect of encouraging group membership, participation, and creation as a means to ameliorate the consequences of social isolation and improve mental health. Preliminary results suggest that G4H significantly improves

participants' social connectedness and well-being and that these improvements were mediated by their increased identification with G4H groups as well as multiple group membership.

Thus, acknowledging the potential value of such budding and innovative approaches to healthcare, extensive, specific, and exhaustive knowledge of the benefits of group membership is key. In this context then, our findings may contribute to such knowledge and help inform these types of intervention by providing insight into the importance of social identity meaning and content. For example, in terms of designing, tailoring, and delivering the G4H intervention to different populations (Haslam et al., 2016), it might be useful to be aware of how particular groups may combine more or less successfully dependent on their special characteristics in terms of social identity overlap, value, and compatibility.

Summary: By focusing on the boundaries of the individual's multiple identities as well as the value and expectations placed on these by broader society, we have empirically tested the moderating properties of social identity complexity, stigma, and compatibility on the effects multiple identities have on well-being. In doing so, we have provided support for the idea that the quantity of identities available to a person does predict well-being and resilience. This is consistent with past research in this domain. However, we have also presented original evidence for the idea that this relationship is dependent on the specific features of identities being combined. When multiple group memberships signal distinctiveness of the overall self-concept, this seems to contribute positively to well-being. However, when multiple identities overlap and become enmeshed, this instead detracts from well-being. Moreover, identities that are shrouded with concerns around stigma and incompatibility, might weaken sources of well-being and resilience. In

short, multiple group membership may only benefit the individual under certain circumstances while being detrimental under others.

Importantly, our results speak to the specific processes by which the well-being effects of multiple group memberships occur. While there is considerable evidence suggesting the significance of social support in explaining why group memberships may lead to well-being (Beals et al., 2009; Cohen & Wills, 1985; S.A. Haslam et al., 2005), we identify other channels through which this effect may occur. Specifically, the effects on well-being and resilience were explained by the perceived ease of identity expression as well as social support and inclusion. These processes are interesting as they link the individual's own as well as society's perceptions of their group identifications (i.e., identity distinctiveness and value/devalue), with the way that they present themselves socially (expression), connect with others effectively (social support), and combine multiple identities into a cohesive, streamlined, and supportive self-concept (identity compatibility).

Finally, and at a more general theoretical level, the studies that we have outlined above, tap into the dynamics of the relationship between multiple group membership and well-being on two distinct dimensions. On one hand, SIC relates to the perceived boundaries of group memberships, interpreting the benefits of multiple identities in terms of their overlap and distinctiveness. This view is thus purely descriptive in nature, defining groups by no other marker than their membership limits. On the other hand, the ideas of stigma and compatibility focus on the qualitative meaning and perceived characteristics (e.g. stereotypes, status) of those memberships and their associated identities. From this vantage, groups and their associated identities are not so much determined by their membership boundaries as they are by their socially defined content. Acknowledging these considerations of group membership thus affords a clearer and more comprehensive

understanding of the dynamics that lead to their individual benefits than one focusing chiefly on their sheer number.

Strengths, limitations, and future directions

While the studies outlined in the previous chapters have highlighted different ways in which the relationship between multiple group membership and both resilience and well-being is moderated and mediated, these results are by no means exhaustive, nor are they without their limitations. In this section, we outline the central limits to our research design and execution, and note directions for future research.

Limitations. There are several weaknesses of our studies that need to be addressed. One limitation relates to the use of predominantly female participants across all five studies (84.1% were female), rendering the representative power of our research as primarily relevant to the female population. Further, the complete lack of male participants in the final two studies raises some ambiguity about the exact mechanisms responsible for our findings. That is, whether these effects were due specifically to incompatibility versus processes already associated with stereotype threat (which might be considered a specific form of incompatibility) is not entirely clear. Future research should include a gender-balanced study to ascertain the effects of multiple group membership on the male population as well. It should be noted, however, that to our knowledge, there is no theoretical basis for assuming that these identity processes should work differently for men and women. Indeed, past research looking at multiple group membership and well-being have included samples that are more diverse and reported no gender differences (e.g. Jones & Jetten, 2011; Brooks et al., 2008).

The fact that our participant samples were relatively young (74.8% were between 18-25 years of age) across all five experiments also represents a limitation in our research design as it has been shown that social identity and the self-concept may increase in clarity and definition with age (Lodi-Smith & Roberts, 2010). As people develop a clearer, more streamlined and complex idea of who and what they are, the effects of multiple group memberships for well-being and coping may vary, as might the ability to cleanly manipulate the degree to which self-defining groups are perceived as compatible versus incompatible. Again, diverse samples and varied operationalization of identity structures and meaning are important for establishing the reliability of these effects.

Next, our identity compatibility manipulation might be somewhat problematic. That is, we manipulated compatibility by framing the descriptions of the various identities that participants reflected on. Specifically, we juxtaposed *gender* and *psychology student* by describing the latter identity in either stereotypically male (psychology is statistics driven science) or female (psychology is about caring for and understanding others) terms. However, there is a possibility that instead of creating a sense of compatibility or incompatibility, this manipulation may have acted as identity threat (i.e. all psychology students might feel threatened by statistics and hard science) in which case our results should be interpreted as a product of identity threat rather than compatibility. Although noteworthy, this possibility may nonetheless be slight as we did perform a manipulation check confirming that participants in the compatible condition perceived their identities as significantly more compatible than participants in the incompatible condition. As such, there is at least some support for our contention that compatibility was manipulated.

Finally, our results do not consistently show a direct effect of multiple group membership on well-being. Given the fact that others have demonstrated such an effect previously, begs the

question as to why this was the case for them and not for us. One reason for this could again be to do with our relatively young sample. That is, past studies that have established a direct effect of multiple group membership on well-being outcomes have typically focused on more mature age people (e.g. Haslam et al., 2008; Jetten et al., 2010; Jones & Jetten, 2011). As touched upon above, past research has found that social identities solidify and become clearer with age (Lodi-Smith & Roberts, 2010). Thus, it could be that our results did not indicate a direct effect of multiple group membership on well-being because they were based on a relatively young sample of first-year students, whose identities may still be in development, and therefore not feeding into well-being as cleanly. This idea fits nicely with other published research that did not find a direct effect of multiple group membership on well-being and which was based on young student populations (e.g. Brook et al., 2008).

Other possible explanations for our lack of direct effects of multiple group memberships include publication bias. That is, research may have found no overall effect of multiple group membership on well-being, and due to this lack of statistically significant results, failed to be selected for publication. Overall, however, it should be noted that while our results may be somewhat inconsistent with past research in terms of a direct link between multiple group membership and well-being, we still found that the same factors (social support and identity expression) mediated the link between these two variables. This provides some consistency across our studies.

Future directions. For all of the questions answered in this thesis, several new ones have emerged. For example, on the basis of our results, we can speak to the effects of the boundaries, socially defined content and meaning of identities on the benefits of multiple group memberships.

While this is valuable in its own right, none of our research designs allow for any extensive insight into participants' internal treatment of their multiple identities. That is, while we were able to manipulate and measure identity structures, value, and meaning, and register outcomes in terms of feelings of well-being and physiological resilience, the thought processes underpinning these outcomes remain largely unknown. In the context of many versus few identities, it would thus be interesting to qualitatively examine how individuals reason and negotiate concealable versus obvious stigmatized identities, incompatible identities, or overlapping versus distinct identities. This could allow for a greater understanding of exactly how the individual conceptualizes their self-concept and reconciles the nature and structure of various identity combinations. Presumably, although certain groups might be defined as incompatible in the eyes of others, individuals within those groups are, through some process, able to arrive at a state of subjective compatibility and coherence. In terms of our specific results, investigating these kinds of processes in more detail could also help clarify some of our somewhat counter-intuitive findings, for example, where people with few and highly overlapping or visibly stigmatized identities somehow were better off than people with few and distinct or valued identities (Chuang, 1999; Gold, 2009; Janelle Marisa Jones, 2010; Ruiz, 2010).

Other questions arising from our research concern the connection between the three central identity features discussed above. For example, how do SIC and identity compatibility relate to one another? The somewhat paradoxical notion that multiple overlapping identities (generally a bad thing) are likely to also be compatible (generally a good thing) whereas many disparate identities are more likely to give rise to incompatibility, seems theoretically reasonable. The relationship is likely to be complex, however – especially when considering counter examples of highly overlapping, but nonetheless incompatible identities, including for example, women in the

workforce. That is, there are many women who have careers, and these two categories (women and workers) thus overlap considerably. However, they are also perceived as somewhat incompatible (Burgess & Borgida, 1999; Fiske, Cuddy, Glick, & Xu, 2002; ONS, 2015). In light of these apparent contradictions, it seems pertinent to look at exactly how these different, but potentially related, identity structures interact and affect individual well-being in combination rather than in isolation. For example, it seems totally plausible that the presence of incompatibility in a self-concept comprising many distinct identities moderates the benefits of SIC. And similarly, that the likely compatible nature of highly overlapping identities moderates the negative effects of low SIC. In short, more research is needed to answer these questions.

Further, measuring the effects of multiple group memberships in different contexts than general well-being and psychological resilience may be valuable in further specifying their benefits. For example, the well-being scale used in our studies was broad in scope and asked the participants questions relating to their general lives. While these outcome measures have been validated in providing a reliable measure of an individual's general state of well-being (Hopton et al., 1995), it may be interesting to look at more specific and concrete terms of health and welfare. In a more applied setting, for example, it might be valuable to longitudinally measure the benefits and downsides of various group memberships and their combination as they relate to recovery from or coping with specific affective disorders or physical injuries and ailments (C. Haslam et al., 2008; Jetten et al., 2012).

Finally, and as mentioned in the previous chapter, the results of Studies 3, 4 and 5 are somewhat hazy, lacking in statistically significant results, potentially reflecting a problem with the research methodology and in particular the identity manipulations. Future research should

endeavor to strengthen the identity activation components of these studies to maximize any true effects of multiple group membership in the context of psychological resilience against stress. Creating more potent identity manipulations might involve more extensive and repetitive activation measures. For example, in our studies, identity compatibility was manipulated using a single sentence describing the field of psychology in stereotypically masculine versus feminine terms. In other words, our manipulation was quite subtle. The manipulation text could thus have been expanded and made stronger – for example, by citing bogus references indicating that most people choose to study psychology because of the field’s hard science focus (masculine) or specifically to develop the tools to help and care for individuals directly (female).

General conclusion

As discussed in the Introduction, most of the relevant literature has explored the benefits of multiple group memberships as a result of the solidarity and support that the individual derives from being part of a greater collective. From this perspective, the idea of a straightforward and linear relationship between the number of group memberships and individual well-being has often been advocated. Contrary to past research, however, we provide novel evidence for the notion that the sheer number of group memberships and their associated identities may not be the central factor in determining well-being. Rather, the well-being effects of multiple group membership may be better understood by first accounting for the descriptive characteristics of the individual’s identities (relating principally to boundary overlap and distinction, or SIC), and second, by acknowledging the potential implications of their social value and meaning (i.e., stigma and

compatibility). Specifically, the extent to which the individual is able to effectively engage with the given groups by virtue of what and whom those groups represent, appears to be of utmost importance in understanding their effects on well-being. In addition, the values and attitudes generally endorsed in the broader social environment in which the person exists, determine whether particular groups are valued or stigmatized, compatible or incompatible, and ultimately whether they benefit the individual or not. Understanding these processes thus allows for a more profound understanding of the particular and very specific conditions under which multiple groups support or undercut individual well-being.

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Appendices

Appendix A: Scales used in Study 1

Social identity complexity scale

First, we have a few questions about your social group memberships. As mentioned previously, people belong to many social groups, and have many different ways of seeing themselves. We would like you to think of the social groups to which you belong. In the text box below, list as many groups that you can think of that are relevant to your daily life. Social groups may include, for example, your ethnicity, nationality, profession, sports team membership etc.

Now, please take a moment to think about the social group memberships you just wrote down, and try to determine which group memberships are most significant in your life and social interactions with others or that best describe who you are. In the space below list the four most significant group memberships.

We would like to know a little bit more about the groups you listed. Sometimes there is a great deal of overlap between the members of one group and the members of another group. For example, the group 'nurses' would overlap highly with the group 'women' as most nurses are also women. Conversely, the group 'senior citizen' would overlap very little with university student, as there are relatively few senior citizen university students. Now, for each of the following pairings of the groups you listed above, please indicate the degree to which these group memberships overlap:

1. Of people who belong to Group 1, how many also belong to Group 2?
Very few 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 nearly all

2. Of people who belong to Group 1, how many also belong to Group 3?
Very few 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 nearly all

3. Of people who belong to Group 1, how many also belong to Group 4?
Very few 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 nearly all

4. Of people who belong to Group 2, how many also belong to Group 3?
Very few 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 nearly all

5. Of people who belong to Group 2, how many also belong to Group 4?

Very few 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 nearly all

6. Of people who belong to Group 3, how many also belong to Group 4?

Very few 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 nearly all

Identity importance scale

For this section, we'd like to know how important the groups you listed are to you, and how representative each of the group memberships is of you as an individual. Please indicate the degree to which you agree with the following statements:

7. The group (Group) is an important reflection of who I am.

Strongly disagree 1.....2.....3.....4.....5 Strongly agree

8. In general, belonging to (Group) is an important part of my self-image.

Strongly disagree 1.....2.....3.....4.....5 Strongly agree

Identity value scale

Some group memberships are obvious to others. For example, if someone belongs to an ethnic or religious minority, this group membership might be visible to others by, for example, the colour of the person's skin, or the way they dress (e.g. Jewish kippah, or Islamic hijab). This type of identity visibility, however, sometimes also incurs the judgment of others. For example, being an avid FC Barcelona fan in Barcelona would probably be considered positively by other Barcelonans, and as such wearing the team jersey around this city would meet with approval rather than scorn. However, if one is an FC Real Madrid fan, the display of this team's jersey in Barcelona might not be met with such positive reactions. In the following section we would like to ask some questions about how visible and how positive you feel your group memberships are to others.

Please indicate whether you think these group memberships are generally viewed positively or negatively (1=generally negative, 4=neutral, 7=generally positive).

9. To what extent do you consider your membership with (Group) as generally positive or negative?

Generally negative 1.....2.....3.....4.....5 Generally positive

10. To what extent do you think your membership with (group) is considered positively or negatively by others in the community/society in which you live?

Generally negative 1.....2.....3.....4.....5 Generally positive

Social support scale

11. To what extent do you feel that you have people around you who you could count on if you had a serious problem and needed help?

Not at all 1.....2.....3.....4.....5 Completely

12. How much concern/interest do people show in what you are doing?

None at all 1.....2.....3.....4.....5 Very much

13. How difficult would it be for you to get practical help from people around you if you should need it?

Extremely difficult 1.....2.....3.....4.....5 Not difficult at all

Social inclusion scale

14. Generally, I feel included by my peers in the community.

Not at all 1.....2.....3.....4.....5 Completely

15. Generally, I feel accepted by my peers in the community.

Not at all 1.....2.....3.....4.....5 Completely

Identity expression scale

The following few items are about expressing your identities and how you feel other people may see you. That is, some people may feel fine about expressing their identities in most situations. Others, under certain circumstances, may not feel comfortable being totally up front about who they are.

16. In general, I feel free to fully express myself and who I am to the people around me.
Hardly ever 1.....2.....3.....4.....5 Most of the time
17. In general, other people don't see me the way I want to be seen.
Hardly ever 1.....2.....3.....4.....5 Most of the time
18. Sometimes I feel like other people are trying to put me in a box that doesn't fit.
Hardly ever 1.....2.....3.....4.....5 Most of the time

General well-being scale

Thinking about your life in general, please indicate on the scales provided the extent to which each of the following statements is true for you.

19. In general, how do you feel?
In very good spirits
In good spirits mostly
Am up and down a lot
In low spirits mostly
In very low spirits
20. Are you ever bothered by your nerves?
Very much so
Quite a bit
Sometimes
A little
Not at all

21. Do you ever feel sad, discouraged or hopeless, so much so that you wondered if life is worth living?

Very much so

Quite a bit

Sometimes

A little

Not at all

22. How much stress or pressure are you usually under?

Very much

Quite a bit

Some

A little

None at all

23. In general, how happy, pleased or satisfied are you with your personal life?

Very satisfied

Fairly satisfied

Satisfied on the whole

Rather dissatisfied

Very dissatisfied

24. In general, do you get anxious, worried or upset?

Very much so

Quite a lot

Sometimes, enough to bother me

A little bit

Not at all

25. In general, do you feel disheartened or sad?

All of the time

Most of the time

From time to time

Very occasionally

Not at all

26. In general, do you feel depressed?

Yes, very much so

Yes, quite a bit

Sometimes, enough to bother me

A little, now and then

No, not at all

27. In general, how tense are you?

Extremely tense always

Very tense mostly

A little tense sometimes

Rarely tense

Not tense at all

28. In general, how cheerful are you?

Not cheerful at all

A little cheerful now and then

Cheerful about half the time

Mostly quite cheerful

Very cheerful always

29. In general, how relaxed do you feel?

Very relaxed always

Mostly relaxed

Relaxed about half of the time

Rarely feel relaxed

Never relaxed at all

Demographics

30. What is your age?

__ __ years

31. What is your sex?

Male

Female

32. What is your current occupation?

Unemployed

Student

Tradesman

White collar

Business owner

Academic

Other (please specify)

33. What is your current marital status?

Never married

Married

Living with partner

Divorced
Separated
Widowed

34. In what country were you born?

35. How long have you lived in the UK?

__ __ years

36. People living in the UK come from many different cultural and ethnic backgrounds. Please indicate your ethnicity or ethnicities on the list below.

White

Black

South Asian (e.g. East Indian, Pakistani, Sri Lankan)

Southeast Asian (e.g. Cambodian, Indonesian, Laotian)

Japanese

Korean

Chinese

Middle Eastern/Arab

European

North American Indian, Métis, Inuit

Filipino

Pacific Islander

Latin American

Other (please specify) _____

37. People living in the UK are of many different religious convictions. Do you follow...

Christianity

Islam

Hinduism

Buddhism

Shinto

Sikhism

Judaism

No religion

Appendix B: Scales used in Study 2

This questionnaire focuses on people's group memberships and social identities. As such, the following sections will ask for your opinions and feelings about the groups to which you belong and the ways in which you consider yourself in these terms.

In general, people belong to a wide variety of groups and can have many different ways of viewing themselves and others. For example, people can think of themselves on terms of broad group memberships and social categories – such as gender, ethnicity, nationality and religion – to more exclusive groups, such as sports fan clubs, profession, or a member of a specific congregation. These different group memberships, and the identities they provide, together make up who we are.

Social identity compatibility scale

First, we have a few questions about your group memberships. As mentioned previously, people belong to many groups (including small groups and large social categories), and have many different ways of seeing themselves. We would like you to think of the groups to which you belong and that define who you are. In the text box below, list as many group memberships that you can think of that are relevant to your daily life. These may include, for example, your ethnicity, nationality, sexual orientation, sports team membership etc.

The groups to which we belong often complement one another and are socially compatible. For example, one may identify as 'male', 'father', 'math teacher' and 'sportsfan'. It is somewhat easy to think of and present oneself in these terms, because in many Western societies these categories fit relatively well together. Conversely, considering the current political climate in the Middle East, it

might be hard to be both Jewish and a Palestinian national. In this section, we are interested in how well you think the group memberships you have listed above “fit together” and complement one another.

1. Please take a moment to think about the social categories you just wrote down. In general, how difficult or easy it is to belong to all these groups and categories at the same time?

Very difficult 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 Very easy

Next, we’d like you to try to determine which of the group memberships that you listed are the *most* significant in your life and social interactions with others, and that *best* describe who you are and/ or how you are seen by others around you. In the space below please list the 4 most significant groups or social categories which define who you are.

Category 1
Category 2
Category 3
Category 4

Now, for each of the following pairings of the groups you listed above, please indicate the extent to which belonging to one group makes it difficult or easy to belong to the other:

2. Thinking about C1 and C2, how easy or difficult is it to belong to these two groups/social categories at the same time?

Very difficult 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 Very easy

3. Thinking about C1 and C3, how easy or difficult is it to belong to these two groups/social categories at the same time?

Very difficult 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 Very easy

4. Thinking about C1 and C4, how easy or difficult is it to belong to these two groups/social categories at the same time?

Very difficult 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 Very easy

5. Thinking about C2 and C3, how easy or difficult is it to belong to these two groups/social categories at the same time?

Very difficult 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 Very easy

6. Thinking about C2 and C4, how easy or difficult is it to belong to these two groups/social categories at the same time?

Very difficult 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 Very easy

7. Thinking about C3 and C4, how easy or difficult is it to belong to these two groups/social categories at the same time?

Very difficult 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 Very easy

Identity value & visibility scale

Some social categories are obvious to others. For example, if someone belongs to an ethnic or religious minority, this group membership might be visible to others by, for example, the color of the person's skin, or the way they dress (e.g. Jewish kippah, or Islamic hijab). This type of identity

visibility, however, sometimes also incurs the judgment of others. For example, being an avid FC Barcelona fan in Barcelona would probably be considered positively by other Barcelonans, and as such wearing the team jersey around this city would meet with approval rather than scorn. However, if one is an FC Real Madrid fan, the display of this team's jersey in Barcelona might not be met with such positive reactions. In the following section we would like to ask some questions about how visible and how positive you feel your group memberships are to others.

First, please indicate whether you feel that the identities that you listed above are visible to others.

8. To what extent do you feel that your membership with the category (category) is generally obvious to others?

Not at all 1.....2.....3.....4.....5 Very much

9. To what extent do you feel that you can choose when and to whom you make your membership with the category (group) visible?

Not at all 1.....2.....3.....4.....5 Very much

Next, please indicate whether you think these group memberships are generally viewed positively or negatively (1=generally negative, 4=neutral, 7=generally positive).

10. To what extent do you consider membership with (category) as generally positive or negative?

Generally negative 1.....2.....3.....4.....5 Generally positive

11. To what extent do you think membership with (category) is considered positively or negatively by others in the community/society in which you live?

Generally negative 1.....2.....3.....4.....5 Generally positive

Social Support Scale

The next section relates to the extent of social support you feel that you have in your life, as well as the degree to which you feel included in your immediate community.

12. To what extent do you feel that you have people around you who you could count on if you had a serious problem and needed help?

Not at all 1.....2.....3.....4.....5 Completely

13. How much concern/interest do people show in what you are doing?

None at all 1.....2.....3.....4.....5 Very much

14. How difficult would it be for you to get practical help from people around you if you should need it?

Extremely difficult 1.....2.....3.....4.....5 Not difficult at all

Social Inclusion Scale

15. Generally, I feel included by my peers in the community.

Not at all 1.....2.....3.....4.....5 Completely

16. Generally, I feel accepted by my peers in the community.

Not at all 1.....2.....3.....4.....5 Completely

Identity expression scale

The following few items are about expressing your identities and how you feel other people may see you. That is, some people may feel fine about expressing their identities in most situations. e, under certain circumstances, may not feel comfortable being totally up front about who they are.

17. In general, I feel free to fully express myself and who I am to the people around me.

Hardly ever 1.....2.....3.....4.....5 Most of the time

18. In general, other people don't see me the way I want to be seen.

Hardly ever 1.....2.....3.....4.....5 Most of the time

19. Sometimes I feel like other people are trying to put me in a box that doesn't fit.

Hardly ever 1.....2.....3.....4.....5 Most of the time

General well-being scale

Thinking about your life in general, please indicate on the scales provided the extent to which each of the following statements is true for you.

20. In general, how do you feel?

In very good spirits

In good spirits mostly

Am up and down a lot

In low spirits mostly

In very low spirits

21. Are you ever bothered by your nerves?

Very much so

Quite a bit

Sometimes

A little

Not at all

22. Do you ever feel sad, discouraged or hopeless, so much so that you wondered if life is worth living?

Very much so

Quite a bit

Sometimes

A little

Not at all

23. How much stress or pressure are you usually under?

Very much

Quite a bit

Some

A little

None at all

24. In general, how happy, pleased or satisfied are you with your personal life?

Very satisfied

Fairly satisfied

Satisfied on the whole

Rather dissatisfied

Very dissatisfied

25. In general, do you get anxious, worried or upset?

Very much so

Quite a lot

Sometimes, enough to bother me

A little bit

Not at all

26. In general, do you feel disheartened or sad?

All of the time

Most of the time

From time to time

Very occasionally

Not at all

27. In general, do you feel depressed?

Yes, very much so

Yes, quite a bit

Sometimes, enough to bother me

A little, now and then

No, not at all

28. In general, how tense are you?

Extremely tense always

Very tense mostly

A little tense sometimes

Rarely tense

Not tense at all

29. In general, how cheerful are you?

Not cheerful at all

A little cheerful now and then

Cheerful about half the time

Mostly quite cheerful

Very cheerful always

30. In general, how relaxed do you feel?

Very relaxed always

Mostly relaxed

Relaxed about half of the time

Rarely feel relaxed

Never relaxed at all

Demographics

31. What is your age?

__ __ years

32. What is your sex?

Male

Female

33. What is your current occupation?

Unemployed

Student

Tradesman

White collar

Business owner

Academic

Other (please specify)

34. What is your current marital status?

Never married

Married

Living with partner

Divorced

Separated

Widowed

35. In what country were you born?

36. In which country do you currently reside?

___ ___ *years*

37. What is the nature of your residency in your current country?

Resident by birth _____

Resident by immigration _____

Refugee _____

Asylum seeker _____

38. People living in your country come from many different cultural and ethnic backgrounds. Please indicate your ethnicity or ethnicities on the list below.

White

Black

South Asian (e.g. East Indian, Pakistani, Sri Lankan)

Southeast Asian (e.g. Cambodian, Indonesian, Laotian)

Japanese

Korean

Chinese

Middle Eastern/Arab

European

North American Indian, Métis, Inuit

Filipino

Pacific Islander

Latin American

*Other (please specify)*_____

39. People living in your country are of many different religious convictions. Do you follow...

Christianity

Islam

Hinduism

Buddhism

Shinto

Sikhism

Judaism

No religion

*Other (please specify)*_____

Appendix C: Scales and manipulations used in Study 3, 4 and 5

Identity activation

For the first part of this survey, we would like to learn a little bit about who you are and how you perceive yourself. People belong to many social groups and have many different ways of seeing themselves. These different views and group memberships together make up who they are. For example, social groups may include broad groups, such as those based on ethnicity, nationality, age and gender. Or, they could be based on more specific groups, such as the university you attend, the football team you support, or the church you belong to. Within this context, we would like to know a little bit about you and the social groups of which you are a member.

Using the answer options available, please indicate your group memberships.

1. What is your nationality?
2. What is your gender?
3. What is your main field of study?

(Participants in condition 1 were asked only about one of the three group memberships throughout the survey).

Identity importance

Now, thinking about the groups to which you belong, please take a minute or two to reflect on your membership with these groups. Please indicate on the scale provided, the extent to which you agree with the following statements:

4. My nationality is important to me.
Strongly disagree 1.....2.....3.....4.....5 Strongly agree
5. I am glad to be of the nationality that I am.
Strongly disagree 1.....2.....3.....4.....5 Strongly agree
6. I feel close ties to other people of my nationality.
Strongly disagree 1.....2.....3.....4.....5 Strongly agree
7. Being in the field of psychological science is important to me.
Strongly disagree 1.....2.....3.....4.....5 Strongly agree
8. I am glad to be in the field of psychology.
Strongly disagree 1.....2.....3.....4.....5 Strongly agree
9. I feel close ties with other people in the field of psychology.
Strongly disagree 1.....2.....3.....4.....5 Strongly agree

10. Being female is important to me.
Strongly disagree 1.....2.....3.....4.....5 Strongly agree
11. I am glad to be female.
Strongly disagree 1.....2.....3.....4.....5 Strongly agree
12. I feel close ties with other people of my gender.
Strongly disagree 1.....2.....3.....4.....5 Strongly agree

Manipulation

Now that we know a little bit about who you are, we would like to know more about what it means to belong to each of these groups. All groups in society have different qualities and characteristics. With this in mind, please read the following instructions carefully and then fill out the text boxes.

13. Different national groups have different traditions, for example in terms of culture and history. In a few sentences, please write down what it means to you to be of your nationality.

Text box

14. Similarly, there are also differences between the genders. For example, there is scientific evidence that men and women often have different strengths, weaknesses and preferences when thinking about various things. In a few sentences, please write down what it means to you to be female.

Text box

- 15a. INCOMPATIBILITY MANIPULATION (Condition 3): Finally, different areas of study cultivate different skills. For example, your field of study (i.e. psychology) is a systematic and statistics driven science that focuses on the biological and evolutionary bases of behaviour. In a few sentences, please write down what it means to you to be in the field of psychological science.
- 15b. COMPATIBILITY MANIPULATION (Condition 2): Finally, different areas of study cultivate different skills. For example, your field of study (i.e. psychology) focuses on understanding, caring for and helping people. In a few sentences, please write down what it means to you to be in the field of psychology.

Text box

Compatibility manipulation check

For the next set of questions, we would like to know a little bit more about the groups that you have rated above. The groups to which we belong often complement one another and are socially compatible to a certain extent. For example, one may identify as *male, father, math teacher* and

sports fan. It is somewhat easy to think of and present oneself in these terms, because in many Western societies these categories fit relatively well together. Conversely, considering the social expectations of *gender* and certain professions, it might be more difficult to identify as *male* and *nurse*, or *female* and *engineer*. We are interested in how well you think the group memberships you have listed above “fit together” and complement one another.

16. Please take a moment to think about the social categories you thought about in the previous part of this survey – that is, your gender, field of study and nationality. In general, how difficult or easy is it to belong to all of these social categories at the same time?

Very difficult 1.....2.....3.....4.....5 Very easy

17. Now, for each of the following pairings of these categories, please indicate the extent to which belonging to one group makes it difficult or easy to belong to the other. Thinking about your gender and your field of study, how difficult or easy is it to belong to these two social categories at the same time?

Very difficult 1.....2.....3.....4.....5 Very easy

18. Thinking about your gender and your nationality, how difficult or easy is it to belong to these two groups/social categories at the same time?

Very difficult 1.....2.....3.....4.....5 Very easy

19. Thinking about your field of study and your nationality, how difficult or easy is it to belong to these two social categories at the same time?

Very difficult 1.....2.....3.....4.....5 Very easy

Support and Inclusion

20. I have people around me who I can count on if I have a serious problem and need help.

Strongly disagree 1.....2.....3.....4.....5 Strongly agree

21. People show concern/interest in what I do.

Strongly disagree 1.....2.....3.....4.....5 Strongly agree

22. It is not difficult to get practical help from people around me should I need it.

Strongly disagree 1.....2.....3.....4.....5 Strongly agree

23. In general, I am included by my peers in the community.

Strongly disagree 1.....2.....3.....4.....5 Strongly agree

24. In general, I am accepted by my peers in the community.

Strongly disagree 1.....2.....3.....4.....5 Strongly agree

Identity expression

The following few items are about expressing your identities and how you feel other people may see you. That is, some people may feel fine about expressing their identities in most situations. Others, under certain circumstances, may not feel comfortable being totally up front about who they are.

25. In general, I feel free to fully express myself and who I am to the people around me.

Hardly ever 1.....2.....3.....4.....5 Most of the time

26. In general, other people don't see me the way I want to be seen.

Hardly ever 1.....2.....3.....4.....5 Most of the time

27. Sometimes I feel like other people are trying to put me in a box that doesn't fit.

Hardly ever 1.....2.....3.....4.....5 Most of the time

Resilience

The next few questions relate to how you react to and feel during times of stress and hardship.

28. I tend to bounce back quickly after hard times.

Not at all true 1.....2.....3.....4.....5 Very true

29. I have a hard time making it through stressful events.

Not at all true 1.....2.....3.....4.....5 Very true

30. It does not take me long to recover from a stressful event.

Not at all true 1.....2.....3.....4.....5 Very true

31. It is hard for me to snap back when something bad happens.

Not at all true 1.....2.....3.....4.....5 Very true

32. I usually come through difficult times with little trouble.

Not at all true 1.....2.....3.....4.....5 Very true

33. I tend to take a long time to get over set-backs in my life.

Not at all true 1.....2.....3.....4.....5 Very true

General well-being scale

Thinking about your life in general, please indicate on the scales provided the extent to which each of the following statements is true for you.

34. In general, how do you feel?

In very good spirits

In good spirits mostly

Am up and down a lot

In low spirits mostly

In very low spirits

35. Are you ever bothered by your nerves?

Very much so

Quite a bit

Sometimes

A little

Not at all

36. Do you ever feel sad, discouraged or hopeless, so much so that you wondered if life is worth living?

Very much so

Quite a bit

Sometimes

A little

Not at all

37. How much stress or pressure are you usually under?

Very much

Quite a bit

Some

A little

None at all

38. In general, how happy, pleased or satisfied are you with your personal life?

Very satisfied

Fairly satisfied

Satisfied on the whole

Rather dissatisfied

Very dissatisfied

39. In general, do you get anxious, worried or upset?

Very much so

Quite a lot

Sometimes, enough to bother me

A little bit

Not at all

40. In general, do you feel disheartened or sad?

All of the time

Most of the time

From time to time

Very occasionally

Not at all

41. In general, do you feel depressed?

Yes, very much so

Yes, quite a bit

Sometimes, enough to bother me

A little, now and then

No, not at all

42. In general, how tense are you?

Extremely tense always

Very tense mostly

A little tense sometimes

Rarely tense

Not tense at all

43. In general, how cheerful are you?

Not cheerful at all

A little cheerful now and then

Cheerful about half the time

Mostly quite cheerful

Very cheerful always

44. In general, how relaxed do you feel?

Very relaxed always

Mostly relaxed

Relaxed about half of the time

Rarely feel relaxed

Never relaxed at all

Appendix D: Stressors for studies 4 and 5

Next, you will be presented with a series of problems of logic which you will have six minutes to solve. Once you have solved these puzzles, or your time has run out, you will be prompted to explain the precise nature of the reasoning you employed in your attempt to figure out the solutions. The explanation of your logic will be recorded by the researcher, and should be clear enough for others to understand and use.

Puzzle 1

Cannibals ambush a safari in the jungle and capture three persons. The cannibals give them a single chance to escape uneaten.

The captives are lined up in order of height, and are tied to stakes. The person in the rear can see the backs of the other two, the person in the middle can see the back of the person in front, and the person in front cannot see anyone. The cannibals show the captives five hats. Three of the hats are black and two of the hats are white.

Blindfolds are then placed over each person's eyes and a hat is placed on each of their heads. The two hats left over are hidden. The blindfolds are then removed and it is said to the captives that if one of them can guess what color hat they are wearing they can all leave unharmed.

The person in the rear says, "I don't know". The person in the middle says, "I don't know". The person in front says "I know!"

How did this person know the color of their hat and what color was it?

Answer:

The man in front knew he was wearing a black hat because he knew the first man did not see two white hats and he knew that the second man did not see one white hat. He knew this because if the first man saw a white hat, the second man would have known that his hat was black from hearing the first man's statement.

Puzzle 2

A farmer wants to cross a river, bringing a wolf, a goat, and a cabbage. There is a boat that can fit the farmer plus either the wolf, the goat, or the cabbage. If the wolf and the goat are alone on one shore, the wolf will eat the goat. If the goat and the cabbage are alone on the shore, the goat will eat the cabbage.

How can the farmer bring the wolf, the goat, and the cabbage across the river?

Answer:

The farmer takes the goat across (leaving the wolf and cabbage behind). The farmer returns alone. The farmer then takes the wolf across, and returns with the goat.

* We now have the Farmer, the Cabbage and the Goat on one side and the Wolf on the other side
The farmer takes the cabbage across, and returns alone. He then takes the goat across.

Puzzle 3

A peasant is caught on the King's property, and is brought before the King to be punished. The King says, "You must give me a statement. If it is true, you will be killed by lions. If it is false, you will be killed by trampling of wild buffalo." But in the end, the King has to let the peasant go. What was the statement given to the King?

Answer: "I will be killed by trampling of wild buffalo."

Logic: The King can't say it is true, because if so the man should be killed by the lions. But, if he is killed by the lions, then his statement would be false, and so should have been trampled by buffalo.

So, the King can't tell if it is a lie or truth, so decides to just let him go.