



University of Dundee

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Hopkins, Nick; Reicher, Stephen David

Published in:
European Journal of Social Psychology

DOI:
[10.1002/ejsp.2288](https://doi.org/10.1002/ejsp.2288)

Publication date:
2017

Document Version
Peer reviewed version

[Link to publication in Discovery Research Portal](#)

Citation for published version (APA):
Hopkins, N., & Reicher, S. D. (2017). Social identity and health at mass gatherings. *European Journal of Social Psychology*, 47(7), 867-877. <https://doi.org/10.1002/ejsp.2288>

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Social identity and health at mass gatherings

Nick Hopkins

University of Dundee

&

Stephen Reicher

University of St Andrews

Nick Hopkins, Psychology, Social Sciences, University of Dundee, Dundee, DD1 4HN, Scotland. Email: n.p.hopkins@dundee.ac.uk

Stephen Reicher, Psychology and Neuroscience, University of St Andrews, St Andrews, KY16 9JP, Scotland. Email: sdr@st-andrews.ac.uk

Acknowledgements

The Prayag Magh Mela research was funded by the ESRC (UK) research grant 'Collective participation and social identification: A study of the individual, interpersonal and collective dimensions of attendance at the Magh Mela' (RES-062-23-1449). We gratefully acknowledge the input of Dr. Kavita Pandey, Dr. Shail Shankar, and Dr. Shruti Tewari, who conducted the interviews.

Abstract

Identifying with a group can bring benefits to physical and psychological health. These benefits can be found with both small-scale and large-scale social groups. However, groups can also be associated with health risks: a distinct branch of medicine ('Mass Gathering Medicine') has evolved to address the health risks posed by participating in events characterized by large crowds. We argue that emphasizing either the positive or the negative health consequences of group life is one-sided: both positive and negative effects on health can occur (simultaneously). Moreover, both such effects can have their roots in the same social psychological transformations associated with a group-based social identification. Reviewing evidence from across a range of mass gatherings, we offer a conceptual analysis of such mixed effects. Our account shows i., how social identity analyses can enrich mass gatherings medicine, and ii., how social identity analyses of health can be enriched by examining mass gatherings.

Keywords: mass gathering medicine, pilgrimage, social identity, health, social cure,

How do groups impact health and well-being? Emergent work in psychology and in medicine appears to answer this question in very different ways.

On the one hand, social psychologists have begun to explore the impact of identifying with others as part of a common collectivity upon both physical and mental health (Jetten, Haslam & Haslam, 2012). Such effects of shared social identification have been studied in small face-to-face groups (Haslam, O'Brien, Jetten, Vormedal & Penna, 2005, Gleibs, et al., 2011), online communities (McNamara & Parsons, 2016), and larger-scale groups (Bakouri & Staerklé, 2015; Khan et al., 2014). While there is acknowledgement that these effects can be negative (e.g., group norms sustaining unhealthy practices such as smoking and drinking: Tarrant & Butler, 2011) the overwhelming emphasis has been on the positive impact of group processes. In particular, it has been shown how shared identity increases people's expectations of social support (Haslam, Reicher, & Levine, 2012), enhances people's sense of control (Greenaway et al., 2015) and lowers stress (Haslam & Reicher, 2006). The dominant message is that groups are good for you.

Medical researchers take a much more negative view. The main way in which they have addressed the relationship between collectivity and health is through the new field of mass gatherings medicine (MGM). This addresses such phenomena as large sporting events (e.g., the Olympics), music festivals (e.g. Glastonbury), and pilgrimages (e.g., the *hajj*). The emphasis is specifically on the risks associated with the convergence and dispersal of large numbers of people (Memish, Stephens, Steffen & Ahmed, 2012; Tam, Barbeschi, Shapovalova, Briand & Memish, 2012). Indeed MGM can be seen as a response to a nightmare scenario in which people assemble together from around the world, share their diseases and then go back home to create a global pandemic. Moreover, there is good evidence that mingling together in close proximity

impacts infection transmission (Abubakar, et al. 2012; Yezl, Wilder-Smith & Bin Saeed, 2016), that music festivals and pilgrimages can spread disease (Blyth et al., 2010; Botelho-Nevers & Gautret, 2013; Gautret & Steffen, 2016; Lee, 1991) and that the risks to health are compounded by the rudimentary living and sanitary facilities common at such events (Steffen, et al. 2012) as well as by the stress and physical dangers (e.g., crushing) of living in crowded, noisy conditions (Illiyas, Mani, Pradeepkumar & Mohan, 2013). The dominant message is that mass gatherings are bad for you.

So how can we reconcile these apparently irreconcilable messages? The first point to be made is that the focus of these two approaches is somewhat different. MGM is mainly concerned with specific physical conditions, especially communicable diseases, whereas the psychological work is more concerned with general health and well-being - both physical and general. It is perfectly consistent to argue that people are more likely to contract particular diseases in collective settings, but that for the majority who do not, health and well-being are enhanced – and hence, overall, health improves. This latter finding is what emerges from our own studies (Khan et al., 2015; Tewari, Khan, Hopkins, Srinivasan, & Reicher, 2012).

The second point, which flows from this, is that a more balanced account depends upon psychologists becoming more sensitive to the specific domain of disease and disease transmission, and upon medics becoming more sensitive to the psychological changes which occur in mass settings and the ways that these impact the broad range of health issues. We need, in other words, to integrate the insights of the different disciplines and to examine how the psychology of groups impacts general health practices and health outcomes for both good *and* ill.

That is what we seek to do in this paper. We proceed by considering the various psychological transformations which, according to previous research (e.g. Reicher, 2001, 2011),

occur when people become part of a mass gathering. Then we explore the various ways in which each of these transformations might lead to either improvements or deteriorations in health.

We carry out these explorations using our own primary research on one of the world's largest mass gatherings, the *Prayag Magh Mela* which occurs annually in Northern India. However we complement this with secondary analysis of the little research that exists in other settings. What we offer, then, is neither a conventional empirical account nor a standard research review. Rather, it is an attempt to elaborate a conceptual taxonomy of health effects in mass gatherings, and to populate that taxonomy using illustrations from what little empirical evidence there is to hand.

Two points need emphasis. First, our analysis is genuinely qualitative in that we are seeking to explore *what sorts* of effects mass gatherings have on health. In the same way that discovering one black swan alerts us to a new type of swan – without telling us anything about how many black swans there are compared to white swans – so we simply offer evidence of the diversity of the links between mass gatherings and health. Second, we make no claims about the relative seriousness of these different effects. That they exist is enough for now.

Our aim then is simply to show that by integrating the social psychology of groups and mass gatherings medicine we benefit both. More importantly, we achieve a richer and more nuanced understanding of the group-health relationship

Social identity at mass gatherings

From a social psychological perspective, mass gathering medicine's emphasis on the sheer number of participants at such events is problematic. Crowds are not simply agglomerations of large numbers of different people. Rather, when gathered together, people may come to think of themselves in terms of a common group membership which leads them to

act in ways that are different from when they are thinking of themselves in terms of their idiosyncratic personal identities (Reicher, 2001). The psychological transformations associated with categorising oneself alongside others in terms of a shared identity do not entail a loss of identity. Rather they entail a shift from a sense of personal identity (what makes me, as an individual, distinctive compared to other individuals) to a sense of social identity (what makes us, as a group, distinctive compared to other groups). Thus, at mass gatherings (e.g., the hajj, the football world cup, a music festival) people may think of themselves as members of a collective with a shared identity (e.g., as hajjis, as football fans, as festival-goers). A shared identity is not guaranteed: Mass gatherings differ in the degree to which this is likely. Moreover, individuals at the same event may experience different degrees of shared identity with other participants.

However, to the degree that an individual does indeed identify with others the basis for their behaviour changes. This is well-illustrated in analyses of crowd behaviour (Reicher, 2001, 2011). First, rather than acting on the basis of their personal (and thus idiosyncratic) beliefs and values, they act on the basis of their understandings of the group's norms and values. That is, there is a 'cognitive shift': The priorities people set, the goals they pursue, and the behaviours they enact, are based upon what group members believe it means to be a hajji, a fan, a festival-goer or whatever. Second, there is a 'relational shift': a shared identification results in greater cooperation, trust, respect and social support amongst group members (Haslam, et al., 2012; Levine, Prosser, Evans & Reicher, 2005; Wakefield, et al., 2011). Third, there is an 'affective shift': Group members' affective states are transformed. Historically, the often intense emotions in crowds have been misunderstood as signalling a loss of identity and rationality, and it is easy to see how this contributes to the image of crowd processes as likely to undermine healthy decision-making (e.g., the literature on crowd 'panic': Drury, Novelli, & Stott, 2013). In

contrast, the social identity approach argues that group members' affective experiences are no longer based upon their personal and idiosyncratic responses to what is going on but are bound up with appraisals that are shaped by their social identification (Smith, Seger, & Mackie, 2007). For example, group members' positive affective reactions to events are shaped by the degree to which the events are identity-affirming (Drury & Reicher, 2005), and participants are able to enact valued social identities in the crowd (Hopkins et al., 2016). So too, positive affect results from being recognised as group member (Hopkins & Greenwood, 2013), experiencing a shared identity and relational intimacy with others, etc (Neville & Reicher, 2011).

The Prayag Magh Mela

The Prayag Magh Mela exemplifies many of the features associated with mass gatherings. Every year, (mid-January to mid-February) pilgrims gather at the confluence of the Ganges and Yamuna rivers to perform a series of sacred rituals - notably to bathe in the Ganges (or *Ganga*). The event is on a 12-year cycle and in the twelfth year (the *Maha Kumbh Mela*) it is claimed that upwards of 70 million attend. However, even the annual gathering attracts millions, with hundreds of thousands (known as *Kalpwasis*) undertaking to remain for the full month. Kalpwasis live in rudimentary tents, experiencing night-time temperatures approaching zero centigrade. Elementary health facilities are organised by the authorities (Dwivedi & Cariappa, 2015) but the conditions remain basic and MGM researchers highlight how the risks posed by these conditions are compounded by having so many people in one place at one time (Siddarth & Roy 2016; Sridhar, Gautret & Brouqui, 2015). Most obviously, they highlight the potential for crushing and for diseases to spread amongst and beyond the pilgrim community. Such concerns have a basis in reality: In 1954 approximately 350 were killed in a crush and there is good

evidence that infection transmission at the 1817 Kumbh Mela allowed pilgrims and British naval officers to spread cholera far and wide, resulting in the first Asiatic cholera pandemic of 1817-1824.

The fact that Kalpwasi pilgrims camp on the banks of the Ganges for a month and differentiate themselves from others (who may only attend for a few days around a particularly auspicious bathing day) means that there is potential for a strong distinctive shared identity to develop. Moreover there is evidence that this sense of shared identity is significant in terms of normative behaviour, participants' relationships with each other, and their affective state (Buzinde, Kalavar, Kohli, & Manuel-Navarrete, 2014; Hopkins et al., 2015). Questionnaire data reveal relationships between shared identity and increased intimacy (Khan et al., 2015) and positive emotion (Hopkins, et al., 2016). Moreover, there is evidence that pilgrims' health and well-being improved from before the event to after the event (Tewari, et al., 2012) and that a greater sense of shared identity was indirectly associated with better post-event health *via* the belief one had closer relations with one's fellow pilgrims (Khan et al, 2015). However, while participation had such an effect at the aggregate level, it would be misleading to ignore the enhanced risks of specific conditions that so concern mass gathering medicine. Our task, then, is to explain how group process can simultaneously have both positive and negative health implications.

A conceptual analysis of identity and health at mass gatherings

Our conceptual analysis takes the three identity-related transformations (cognitive, relational, affective) identified in crowd research (Reicher, 2011) and considers how each may be associated with both positive and negative health and well-being outcomes at mass gatherings

(resulting in 3 x 2 conceptual grid of identity-related effects). As we previously indicated, the evidence we draw upon to illustrate these effects comes in part from research cited in the field of mass gathering medicine, but principally from our own research with Kalpwasis at the Magh Mela. This latter involved a longitudinal survey (Khan et al., 2015; Tewari et al, 2012), experiments (Shankar et al., 2013; Srinivasan et al., 2013), and ethnographic observation and interviews with 37 Kalpwasis (Hopkins, et al., 2015; Pandey, Stevenson, Shankar, Hopkins, & Reicher, 2014; Shankar et al., 2013). All the data are available at <http://data-archive.ac.uk>. Our procedure was to conduct a systematic reading of this corpus in order to find examples that would fit into each of the six cells of our conceptual grid (Table 1 provides illustrative examples). Where we cite data from these interviews in the ensuing text, we note the participant's unique identification number, sex and age.

A.1.Cognitive transformations: Health benefits

As we have argued, in the mass people shift from acting on the basis of idiosyncratic standards to acting on the basis of shared norms and values. However, the norms and values associated with any specific mass gathering depend on the identity enacted at the events. Some mass gatherings may be characterised by norms that encourage practices that carry health-related risk, e.g., music festivals may be associated with values that endorse alcohol or drug consumption, sex, etc. Other events (e.g., religious gatherings) may be characterised by norms that prohibit such activities and thus exert a protective function. Moreover, even if there are not explicit prohibitions on one risky behaviour, the likelihood of its occurrence may be impacted by prohibitions on other behaviours. For example, norms against alcohol or drug use may impact

other health-related practices e.g., decreasing the likelihood of infection transmission via unprotected sex.

At the Magh Mela the values and norms governing those who elect to stay for the full month are intended to allow pilgrims to free themselves from everyday concerns and engage with the spiritual (Buzinde, et al., 2014; Hopkins, et al., 2015). This goal is manifested in dietary prescriptions: Pilgrims adopt a simple vegetarian diet of one meal per day cooked without salt, onions or garlic (because these latter – ‘Tamasic’ foodstuffs - are thought to stimulate the senses). The degree to which a change in salt intake for a month impacts health (e.g., reducing blood pressure) is unclear. However, when interviewed, participants often reported that they felt their new dietary regime brought benefits. Inevitably, such evaluations were bound up with identity-related belief. For example, one participant (P#21 Female, 60) reported that this normatively-prescribed fasting and simple diet brought a sense of calm: “Hardly one or two full meals in eighteen days, and the rest are fasts. That is why the motion for toilet or urine does not build up much. There is control over the senses, so the senses are not out of control, as most of the Kalpawasis are in control. Like we don’t eat radish, don’t take garlic, onion, we don’t take *Tamasic* food, it increases hyperactivity. Hyperactivity increases, by these foods. We live by swastika rules, so the memory power of our people becomes sharp. And we feel more relaxed. We feel healthy, we feel well.”

Other Kalpwasi norms with the potential to improve health included the injunction to bathe in the Ganges (*Mother Ganga* or *Ganga ji*) twice a day. This bathing was construed as bringing benefits to health. Thus, when the interviewee cited above (P#21) was asked if they felt healthier, they explained “Yes, feel active and healthy. And in body and by bathing in the Ganga water regularly we feel a bit change in our colour. When we go back from here to village, people

say that your colour is bright now.” In some respects the benefits attributed to bathing are likely to be bound up with identity-related beliefs (concerning the washing away of one’s sins).

However, there may also be indirect effects of behavioural change. For example, the benefits associated with bathing may reflect the fact that the size of the event meant Kalpwasis had to walk several kilometres each day. For some (especially women) this represented a significant increase in physical activity. Thus, when asked about her walk to the bathing *ghats*, one woman (P#16 Female, 57) explained that at home there was “No walking, it’s like, nobody opens the door at home. There are steps to come down. Nobody takes me with them. As you come out (of home) there is the road. So, can get hit by some vehicle or so. And here it’s like “get set, go”. There’s been lots of difference.”

Another health-benefitting norm concerned the injunction to escape everyday concerns of village life to focus on the spiritual. This was made concrete in norms concerning the avoidance of gossip and the formation of the *satsang* (which translates as an assembly of persons who listen to and speak spiritual truths). For example, one interviewee (P#37 Female 62) explained that ‘the most important thing here is the *satsang*. No one gossips about others. No one wants or looks for failings in others. [] All become like one family. This is what is called *satsang*. Kalpwasis means this only - that you do not criticize or gossip about each other. Each one follows the rules’. Such norms could have a direct impact on stress levels. They could also have an indirect effect on stress through encouraging more positive interactions and a stronger sense of relational intimacy and social support (see *B.I. Relational transformations: Health benefits*). Whatever the mechanisms involved, the sense of calm associated with observing these norms was clear: This same interviewee explained that ‘for one month we see heaven, after that daughter, [we are] again in to that same *mayajaal*’ (a term referring to the trap of worldly affairs).

A.2. Cognitive transformations: Health risks

Norm-following can also have negative health implications, and these may relate to both psychological and physical health. The wish to fulfil demanding prescribed rituals can result in stress and exposure to physical demands. Moreover, identity-related norms may encourage behaviour that brings direct risk to physical health. At the Hindu mass gathering at the Lord Murugan Temple of Nallur in Jafna (Sri Lanka) the norms for pilgrims require bathing in the temple's water tank before performing rituals whilst rolling on sand. These normative practices expose the pilgrims to infections of the skin caused by parasitic larvae buried in the sand (*cutaneous larva migrans* - see Kannathasan, Muruganathan, Rajeshkannan, & de Silva, 2012). This illustrates the hidden health risks of some identity-related norms. More strikingly, Kannathasan et al. report that the identity-related beliefs of the pilgrims resulted in some interpreting the changes to their skin as signs of divine 'grace' rather than as symptoms of ill-health. Such interpretations illustrate the point that health-related symptoms are evaluated through reference to identity-related beliefs and values (Levine & Reicher, 1996) and that these may lead to interpretations of symptoms that have the unfortunate implication of discouraging people from seeking medical intervention. Moreover, identity-related norms concerning medical treatment may discourage interventions that are required (Thomas, 1992).

Similar processes may be relevant to understanding the health risks associated with pilgrims drinking water from the Ganges at the Magh Mela. Although the river is highly polluted, pilgrims believe Ganges water to be pure (the river being a goddess) and actively choose to drink it. Indeed, in one interview, the participant (P#25 Female 60) asked for a drink of Ganges water ("give me some *Ganga jal*") and when the interviewer offered a bottle of ordinary

water was told “No, I won’t have that water” with another interjecting “these people do not drink anything except from the Ganges”. Others reported that such were the benefits of drinking this (contaminated) water and of being at the Mela that they no longer felt the need to continue with taking prescribed medicines. In turn, the view that divine power protects participants at religious mass gatherings may discourage acceptance of advice warning of unhealthy practices. For example, at the hajj it is normative for male pilgrims to shave their heads and razors may be shared with obvious risks for blood-borne viruses (Rafiq, Rashid, Haworth & Booy, 2009). If participants believe they are protected by the divine then attempts to change such practices concerning the sharing of razors may well fall on deaf ears. Indeed, one hajji, described as wiping dripping blood from his head, is quoted as responding “We are on hajj, so God will cause no harm to us” (Voice of America).

More generally, identity-related norms may reduce the value placed upon health and well-being. Pilgrims at the Magh Mela strive to transcend the material in order to devote themselves to a spiritual existence and a degree of ill-health is expected and accepted. Indeed, Maclean (2008, p. 32) cites evidence from analyses of Hindu pilgrimage that when returning home, comments on how ill and weak the pilgrim looks are normal and standard greetings. Moreover, there is evidence that the prospect of death is evaluated differently at pilgrimage sites. In Hindu traditions pilgrims are able to attain a state of purity that makes death at the site (and in such a state) auspicious, and Maclean notes that such beliefs underlie the popularity of a Hindi proverb amongst pilgrims which states that ‘if we die, we will attain salvation’. In similar vein, Maclean refers to the 1892 Hindu Haridwar Mela (north India) where there was a cholera outbreak and notes that the pilgrims responded to the order to disperse with the protest “It is better to die here. We won’t go home” (Maclean, 2008, p. 138). Evidence from the hajj also

suggests that having achieved a state of purity through their pilgrimage, some pilgrims valorise death over earthly existence (Onislam, n.d.). Needless to say, to the extent that identity-related beliefs devalue health they may encourage risky behaviour.

Another way in which identity-related beliefs and values impact exposure to ill-health is through encouraging behaviours that create the conditions for ill-health to flourish. At sporting fixtures in Asia and Africa it is commonplace for members of the crowd to blow vuvuzelas (plastic blowing horns) which can facilitate the generation and dissemination of respiratory aerosols (Lai, Bottomley & Mc Nerney, 2011) thereby facilitating infection transmission. In similar vein, at the Magh Mela, norms concerning bathing in the Ganges can contribute to the river's pollution and bacteria spread. During the Mela, the numbers bathing in the Ganges peaks on particularly auspicious bathing days (e.g., *Paush Purnima*, *Mauni Amavasya*) and this impacts on the levels of *E. coli* and fecal coliform counts (Vortmann, Balsari, Holman, & Greenough, 2015). Thus it seems that identity-related norms can increase the potential for infection transmission through contributing to the contamination of the shared environment.

B.1. Relational transformations: Health benefits

Crowds are routinely viewed as constituting a stressor. However, the transformation in one's social relations associated with a shared social identity can impact the experience of physical proximity. Laboratory studies show that when others are regarded as fellow ingroup members we chose to be closer to them than when they are regarded as outgroup members (Novelli & Drury, 2010). Applying these ideas in a field study of an outdoor music event, Novelli, Drury, Reicher, and Stott (2013) found that stronger identification with others resulted in participants feeling less crowded (even when, objectively, the crowd was very dense) and to a

more positive experience. Thus, what may easily be assumed a stressor (crowding) is not necessarily experienced as such: proximity may be welcomed and any potential negative psychological effects of crowding, overcome. Moreover, applying this to the hajj, Alnabusi and Drury (2014) found that hajjis who had a strong identification with others in the crowd had a better experience of crowding and that this experience was bound up with the perception that crowd members would provide support if it was needed.

Our own interview data also suggest that a shared identity impacts perceptions of the availability of social support: Many Kalpwasis spoke of how they helped each other and knew that others would help them. Sometimes this support was described as forthcoming when one was ill. For example, one (P#1 Male 82) explained that the relations between Kalpwasis were positive and continued: “All give help [] ohh, if I will fall ill then they would do [] when one would be unhealthy then they would help!”. In similar vein, another (P#3 Male 74) spoke of the relations as being like those amongst ‘relatives’: “now, some are relatives! All help each other, help like a family, with money, take them to hospital.” When asked if this had happened, they continued: “yes, it has happened! Many people were ill, we took them to hospital, no money was there [i.e., they had no money]. We collected the contributions and took them, after that there was no blanket, then we took the blanket to cover”. Still others referred to the sharing of their medical resources with those who were in medical need. Thus, one (P#5 Male 55) explained: “Like medicines, someone helps other, like someone is ill, so then there is help. Men, like I have medicines, they come for it, I will give, like this. Or, I have medicines, all come. That brother [says] ‘there is pain in stomach, there is fever, cold, I caught cold’, so I give medicines, just that. There is a relation amongst people!”

Sometimes this sharing and helping was explained in terms of a strong sense of relational connection. Sometimes it was spoken of in terms that also implied a prescriptive norm associated with the Kalpwasi identity (see above: *A.I. Norms and values: Health benefits*). Thus, one interviewee (P#7 Male 38) responded to the question “What kind of relations do people have with each other here?” as follows: “As per my understanding, they are much better. Not better, but *much* better relations. My own foremost duty is that if someone is not feeling well, then my first duty, when I come here my first duty is to find out where is hospital. I look for this thing, where is it, this is my first responsibility. If someone is not feeling well, I bring medicine for them. If it doesn’t help, then I will take them to hospital. If there is a need for saline in night, then I would do that also. I bring them back on my own.” Another formulated this identity-related injunction to provide help to others through reference to the divine. Referring to a duty to help those from other encampments in the Mela, she (P#26 Female 75) explained “Yes, you surely have to go [] This is why god has sent us isn’t it? [] This is why he has sent. You do not get reward by bathing. Reward is by serving all.” Such examples hint at the complex relationship between the various identity-related transformations (here, the relational and the cognitive). Moreover, they make the point that these are analytic categories and that any behaviour is likely to be multiply determined.

B.2. Relational transformations: Health risks

The same relational transformations described above can also bring risks. Although there may be pleasures in being densely packed in with those with whom one shares a common social identity, crushing incidents do occur (Illiyas, Mani, Pradeepkumar & Mohan, 2013): In 2013, 36 pilgrims were crushed to death returning home from the Kumbh Mela, and several hundred were

crushed at the 2015 hajj. When considering these risks it is important to note that such incidents do not conform to the popular image of mass irrationality implied in the language of ‘panic’ and ‘stampede’: Restraint and order remain (Drury & Reicher, 2010). However, to the degree that social identity processes underlie the pleasure of being surrounded by one’s fellows (and create a sense of safety) there is a risk that the same identity processes that help one cope with a potential stressor (high density crowding) may blind one to the danger of crushing.

The relational transformations in crowds may also impact health and well-being through facilitating infection transmission. Infection transmission research addresses the inter-individual network connections and social practices (e.g., touching) that facilitate disease spread (Read, Edmunds, Riley, Lessler, & Cummings, 2012). Such research highlights the risks brought by the proximity of large numbers of others (Abubakar, et al., 2012; Yezl, et al., 2016) but does not consider how changes in the social relations between participants associated with a shared identity may impact the person-to-person interactions that facilitate infection transmission. Infections can be transmitted in all manner of practices (e.g., kissing, drinking from the same bottle, using the same eating utensils, etc.) and such practices may be increased where there is a shared identity. That is, the identity-related transformations that contribute to the provision of support may also increase the risk of infection transmission (e.g., through the sharing of resources).

This potential is hinted at in research concerning disgust. It has long been argued that a sense of disgust evolved as a mechanism to minimise inter-individual pathogen transmission (Curtis, de Barra & Aunger, 2011). Recent research shows disgust reactions may vary according to how the other person is categorised: Smelling a sweaty t-shirt belonging to a stranger is less disgusting when the stranger is defined as ingroup rather than outgroup (Reicher, Templeton,

Neville, Ferrari & Drury, 2016). Whilst such an attenuation of disgust may contribute to the positivity of collective encounters, it could also facilitate the occurrence of practices associated with infection transmission (e.g., kissing strangers, drinking from a strangers' bottle, sampling another's food using their eating utensils, etc.). Moreover, reduced disgust at others' proximity may mean one would be less likely to distance oneself from fellow participants who are coughing or showing other signs of illness (e.g., open wounds).

Inevitably, the types of interactions potentially affected by any attenuation of disgust amongst fellow group members depends on the norms of the event. At music festivals, it might be the sharing of bottles of beer. At pilgrimages where there is ritual head-shaving, it might be the sharing of razor blades that is affected (with obvious risks for blood-borne viruses: Rafiq, et al, 2009). Although some research has considered how drinking from a common vessel (e.g., the Communion Cup in Christian ritual) may pose health risks (Pellerin & Edmond, 2013), research has not yet explored the degree to which the sharing of resources is a significant mode of infection transmission or how the frequency of sharing is contingent upon the degree to which people categorise themselves in terms of a shared identity. However, there is medical speculation on such issues (e.g., the infection transmission associated with sharing cannabis joints: Zwenger, 2009) and it is easy to imagine how an increased sense of connection and trust in relation to unknown others in a crowd may result in a lowering of one's guard with regard to requesting resources from others. A shared identity may also make it that much harder to refuse others' requests to share.

C.1. Affective transformations: Health benefits

Crowd events are often characterised by strong emotions and this can easily be understood as revealing irrationality and as contributing to risky decision-making. However, people's affective experiences depend on identity-related appraisals and do not signal irrationality. These appraisals can transform what could be stressors into welcomed experiences. For example, the Magh Mela is saturated with sound-systems constantly broadcasting songs, speeches and announcements (at a level approximating a busy city street: 85-90dB). This could be seen as a stressor. However, the affective response to this auditory environment depends on how it is appraised in relation to pilgrims' identity-related beliefs and values. Interviews with Kalpwasis showed that to the degree that noises were judged to be consonant with the values of the pilgrims' identity there was little sense of it being intrusive or painful (Shankar et al, 2013). Whereas the secular messages of the public announcement system were found annoying, the (very loud) sounds of religious chanting and prayer were interpreted differently, e.g., as the 'sound of the Saraswati' (the mythical river of knowledge which contributes to making the Allahabad Mela such a sacred site: Prayag Magh Mela Research Group, 2007). That is, experience of an auditory stimulus is not simply a reflection of its intrinsic properties but depends on the meanings attributed to it (see too Shayegh, Drury, & Stevenson, 2016).

The significance of this social meaning is confirmed in experimental research conducted in the Magh Mela. Kalpwasis listened to an ambiguous sound clip that was labelled as coming either from the religious festival itself or a secular urban setting. In the former case, pilgrims found the clip more meaningful and interesting, less uncomfortable, and they also chose to listen to it longer (Shankar, et al., 2013). Moreover, the results of time perception studies conducted using this same clip showed that it was processed differently (attracting more attention) when it was designated Mela-related (Srinivasan, et al., 2013; Srinivasan, Tewari, Makwana, & Hopkins,

2015). Again, the point is that what may appear to be intrusive ‘noise’ (and a stressor) can, when viewed from the vantage point of a particular identity, be meaningful ‘sound’ and contribute to positive affect which in turn means that well-being is maintained.

The positive affect arising from identity-related appraisals of sensory experience may help participants overcome the difficulties posed by the harsh conditions of a north Indian winter. Kalpwasis are required to bathe twice daily in the Ganges (once before dawn in what are intensely cold waters). This presents all manner of demands, but the identity-related appraisals (and resultant positive affect) can help pilgrims overcome them (Pandey, et al., 2014). For example, one pilgrim (P#37 Female 62) explained that she had heart problems and high blood pressure, and when asked how she managed the month-long pilgrimage, responded ‘it’s all the divine grace of *Ganga ji*’. She continued that although she struggled with the cold and had a fever, when it came to the early morning bathing, ‘automatically the whole pain is gone’ until she returned to her tent when the pain returned. As she put it ‘till then Mother Ganga keeps all the pain aside. When I will come in the tent then it will come [] Always the face is stressed you see, but in morning if you meet me, then it’s totally fresh’. Again, we get a picture of identity-related appraisals facilitating positive affect in the face of what appears to be a physical stressor. Moreover, there is a sense in which this affect facilitated resilience. Needless to say, the social support associated with a sense of shared identity also contributes to participants’ sense of their efficacy in coping with such stressors (Pandey et al., 2014).

More generally, it is important to note the pleasures associated with being able to enact the norms and values associated with one’s identity (Drury & Reicher, 2005) and of the greater intimacy with one’s fellows (Neville & Reicher, 2011). Questionnaire-based research conducted with Kalpwasis at the Magh Mela shows that both these aspects of a shared ‘Kalpwasi’ identity

contributed to participants' positive affect (Hopkins et al., 2016). Again, such positive affect may contribute to participants' resilience in the face of diverse physical and social stressors. This is hinted at in the words of one Kalpwasi (P#34 Male 55) who, referring to the intensely positive emotions experienced at the Mela (*ananda*) and the painfulness of the cold weather, explained: 'no one is discouraged with all this, this year in the Mela you can see it's very cold here, by God that fog and cold is going on regularly but you will not find any lack in *ananda* the people have here. Like we are fed up of cold, no pilgrims would say "now I am going back to home." There is nothing like this. People will move out only after the month is over'.

C. 2. Affective transformations: Health risks

There are various ways in which the positive affect made possible by identity-related appraisals and increased relational intimacy may be problematic for health. We have already noted that the pleasures of relational intimacy may bring risk (*B. 2. Relational Transformations: Health Risks*). Individuals may overlook the risks of crushing or experience lessened disgust at the prospect of sharing of resources that have the potential to carry infection. Other affect-related risks are associated with the appraisal of the environment. Thus, whilst loud noise may not be experienced as a stressor if construed as identity-affirming it may still cause auditory damage. Positive affect may blind one to the significance of symptoms of ill-health (such that any thoughts about needing treatment are dismissed). Indeed, the positive affect associated with participation may blind one to all manner of risk – including the simple but serious risks posed by the weather (e.g., sunstroke and sunburn, hypothermia). It may also lead individuals to pay less attention to those for whom they have particular responsibilities. This is hinted at in the words of one Kalpwasi (P#2 Male, 53) who explained that one could see whole families bathing

apparently oblivious to the dangers of the cold water. Referring to the presence of children and the elderly, the interviewee explained that the family “do not have this [thought] that the children would get ill or something would happen, especially in this cold or... Come and see for yourself, 4.00 am, now there is crowd there. There are so many people who would bathe at 4.00 am only, they would bathe who are around 60, around 70. They would reach [the bathing site] before us!”

Conclusion

Our purpose in this paper has been explore the complex (and sometimes contradictory) ways in which collective psychology impacts health and well-being at different levels - both in terms of specific conditions and general functioning. In so doing, we have sought to illustrate both how social identity-based analyses of health can contribute to the emergent field of MGM and also how the social identity-based analyses of health can gain by attending to the concerns of MGM.

With regard to the former, MGM researchers invariably assume that participation only brings risks. As we hope to have illustrated, this is partial and one-sided. Participation can benefit health and well-being (Tewari, et al., 2012). Moreover, when we consider the cognitive, relational and affective transformations in social psychological functioning associated with group-based self-categorisations, we have found illustrative evidence to suggest that social identity processes are indeed relevant to understanding such positive effects. The norms associated with participation (which may govern anything from one’s diet to how one orients to others), the sense of support arising from one’s connections with others, and one’s positive affective experience of the event, may all contribute to resilience in the face of potential stressors and result in health and well-being.

Yet, at the same time, we have seen that whilst the psychological transformations associated with shared identity may bring benefits, these same transformations may facilitate negative health outcomes. Norms may encourage risky behaviour. Relational intimacy may shape group members' sharing of resources in ways that facilitate the transmission of infection. The positive emotional experience associated with identity-related appraisals of apparent stressors and the experience relational intimacy may encourage people to downplay signs of ill-health and carry on.

All this suggests that the relationship between groups and health is multi-dimensional. The cognitive, relational, and affective transformations associated with group identity can all work for good or ill. Moreover, they can work for good or ill simultaneously. Sometimes several identity-related transformations may combine to work in one direction: e.g., infection transmission may be increased through both normative practices (e.g., the blowing of vuvuzelas which generate and disseminate respiratory aerosols) and through the relational intimacy associated with a shared identity (e.g., the sharing of bottles). Sometimes, the transformations may work in different directions: e.g., a dense crowd of fellow group members can give a strong sense of support (relational transformation) and thereby improve well-being, but the euphoria of being in such a group (affective transformation) may lead people to ignore the dangers of crushing, increasing risks to well-being. It is also appropriate to note that the distinction between the three transformations (cognitive, relational and affective) is analytic and that in practice they inter-relate in complex ways. For example, the affective transformation may arise as a consequence of the relational and cognitive transformations. Moreover, such an affective transformation may feed back into the cognitive and the relational transformations (as when the

attenuation of disgust associated with a shared identity facilitates relational intimacy and cooperation, which in turn facilitates the enactment of identity-related norms).

It should also be clear that each of the transformations associated with group membership can impact on *both* psychological and physical dimensions of health. For example, identity-related norms can promote psychological and physical health (e.g., Kalpwasi norms concerning spirituality may promote a sense of well-being and Kalpwasi dietary norms may reduce salt-intake). Yet identity-related norms can also work against *both* psychological and physical health (e.g., norms concerning the completion of rituals may put Kalpwasis under psychological pressure and norms concerning the value of health may result in a disregard of any symptoms of ill-health). Needless to say, when considering such effects the differentiation between psychological and physical health should not be drawn too sharply. For example, the psychological sense of control associated with a shared identification may have all manner of physiological implications (e.g., Haslam & Reicher, 2006; Häusser, Kattenstroth, van Dick, & Mojzisch, 2012) which in turn may impact physical health (Figueredo, 2009; Segerstrom & Miller, 2004).

In addition to considering such complexities in how a shared identity relates to health and well-being we should also remember that not all present at any event will experience a sense of shared identity: some may feel psychologically excluded. In turn, this may be another situational factor that impacts health and well-being negatively (Williams & Nida, 2011). Moreover, practices of exclusion may have a normative basis. For example, Kalpwasis from lower castes may feel marginalised at events such as the Magh Mela (which are dominated by higher caste pilgrims).

Inevitably, the present contribution is limited. Given the restricted data base concerning what actually goes on in various mass gatherings we have only been able to provide a few illustrative examples from a restricted range of mass gatherings. With a richer range of examples from a wider range of mass gatherings, more nuanced accounts of the mechanisms underlying both positive and negative outcomes will be possible. Moreover, we have no evidence concerning the frequency or medical significance of any particular mechanism or outcome. In this regard, our conceptual analysis should not be regarded as a review but rather as outlining an agenda for both social psychological and MGM research. With regards to the former, the detailed examination of health-related outcomes at mass gatherings could inform analysis of the complex and contradictory ways in which social identity processes impact health. With regards to the latter, the analysis of social identity processes and their health implications provides a framework for conceptualising the processes that make mass gatherings a distinctive field of medicine. Mass gatherings involve more than large numbers of people and public health initiatives must consider the ways in which people behave. Indeed, as one member of the Harvard School of Public Health team researching sanitation at the 2013 Kumbh Mela explained, it was not enough to simply document the provision, one also must look at the behaviour of those attending and using the facilities: “public health isn’t just about what the government provides; it’s also about how people behave” (Harvard Gazette n.d.). As we hope to have shown, if MGM researchers are to understand crowd members’ behaviour and how it impacts health and well-being for good or ill, they need a social psychology that addresses the distinctive social identity processes involved in group behaviour. Without this MGM research will misunderstand the bases for participants’ behaviour and thus be poorly equipped to design and implement effective (identity-consonant) behaviour-change interventions (Hopkins & Reicher, 2016ab).

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Table 1. A conceptual mapping of the ways in which the psychological transformations associated with a shared social identity impact health for good or ill at the Magh Mela

Psychological Transformation	Health Benefits	Health Risks
A. Cognitive	<p>Dietary norms result in improved diet</p> <p>Enacting bathing norms requires extra exercise, e.g. walking to the bathing <i>ghats</i></p> <p>Norms concerning spiritual practice result in relief from everyday concerns</p>	<p>Bathing norms result in exposure to the cold</p> <p>Bathing increases human pollution of the Ganges, and Ganges water is then consumed</p> <p>The belief that the Gods will look after one encourages pilgrims to stop taking medicine</p> <p>The value placed on health is decreased</p>
B. Relational	<p>Social support is provided and expected</p>	<p>Reduced disgust facilitates the sharing of resources thereby increasing opportunities of infection transmission</p>
C. Affective	<p>Noise and crowding are experienced as a function of their relationship with identity and are not necessarily experienced as stressors</p> <p>Positive emotional experiences can contribute to resilience</p>	<p>Positive emotional experiences can result in overlooking signs of ill-health, dismissing health warnings, and carrying on when one should stop</p>