

# Crowd Behavior at Mass Gatherings: A Literature Review

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None.

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#### Abstract

Gaining an understanding of crowd behavior is important in supporting timely and appropriate crowd management principles in the planning and provision of emergency services at mass gatherings. This paper provides a review of the current understanding of the psychological factors of a crowd within the psychosocial domain as they apply to mass-gathering settings.

It can be concluded from this review that there is a large theory-practice gap in relation to crowd psychology and the mass-gathering setting. The literature has highlighted two important elements of crowd behavior—there must be a “seed” and people must engage. Understanding these behaviors may provide opportunities to change crowd behavior outcomes.

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#### Introduction

Identifying factors that impact public safety at events attended by large numbers of people has been the focus of recent research on mass gatherings. Emerging mass-gathering research identified a number of factors that impact the emergency service workload related to the biomedical and environmental domains.<sup>1–3</sup> Examples include the type of event, physical factors (such as a crowd containment), weather, and the size of the crowd. However, there is a need to further understand crowd behavior to support appropriate and timely crowd management principles in the planning and provision of emergency services at mass gatherings. This paper provides a review of the current understanding of the psychological factors in the behavior of crowds within the psychosocial domain.

The term “crowd” has been used in many contexts. In the literature, the terms “crowd” and “mass gathering” often are used interchangeably. *Mass gathering* has been defined as an organized event occurring within a defined space, which is attended by a large number of people.<sup>1,2</sup> However, there is no consistent definition of crowd. In the mass-gathering literature, the use of terms “crowd behavior”, “crowd type”, “crowd management”, and “crowd mood” are used in variable contexts. More practically, the term “crowd mood” has become an accepted measure of probable crowd behavior outcomes.<sup>3</sup> This is particularly true in the context of crowds during protests/riots, where attempts have been made to identify factors that lead to a change of mood that may underpin more violent behavior.

The notions of crowd, crowd mood, crowd type, and crowd behavior have a number of applications. A majority of research focuses on crowd behavior in context of violence or conflict. Crowd mood has been discussed in the mass-gathering literature in the context of assessing or monitoring crowds; however, there is no agreed or common definition of these terms. Further research on the concept of crowd would be enhanced by more concrete definitions of the colloquia. It is believed that *crowd* refers to the gathering of a large number of people not dependent on the reason for the gathering. *Crowd type* is an environmental descriptor of the demographics of a crowd. *Crowd mood* hails from the crowd type and is more of a psychosocial descriptor of crowd. Crowd

type, crowd dynamics, and crowd mood impact crowd behavior. *Crowd behavior* is the demonstrable factor that requires assessment and monitoring to underpin management actions. No literature has progressed this notion of monitoring, assessing, or describing crowds to underpin interventions or control. Given that the key implication of crowds in this paper relates to mass gatherings, the term “crowd behavior at mass gatherings” is the preferred terminology rather than crowd or crowd mood. This is based on the understanding that the psychological literature often will describe crowd or group behavior in the context of crowds within conflict versus crowds at a mass gathering.

Research has identified the importance of crowds in the management of public safety at mass gatherings. The purpose of this literature review was to gain greater insight on the psychosocial domain of mass gatherings by exploring the psychological factors that influence crowds and specifically, to identify the psychological factors of a crowd to further understand the crowd mood as a workload factor for emergency service providers. The ability to measure the crowd mood, predict the probable behavioral outcomes of changes in the crowd mood, and intervene to divert probable negative outcomes of these changes, would greatly assist the provision of appropriate emergency services at mass gatherings.

### Search Guidelines

In this systematic literature review, the keyword search terms were determined using a search matrix. Initially, the terms “crowd”, “mood”, “behavior”, and “psychological aspects” were entered into the Pubmed MeSH browser to find relevant terms to assist in developing the search strategy. The search query was entered as follows: (mass gathering\* OR crowd\* OR public meeting\* OR sporting event\* OR collective action) AND (mood OR behavior OR psychological aspect\* OR mass hysteria). As indicated, five truncated search terms were used: mass gathering\*, crowd\*, public meeting\*, sporting event\* and psychological aspect\*. The following five databases were searched in October 2006 for material published between 1980 and 2006: (1) Pubmed; (2) PsycINFO; (3) Nursing and Allied Health (CINAHL)-CD; (4) ERIC—Social Sciences; and (5) Academic Search Elite.

All literature in the databases was considered. Of the articles identified, 85% had been published since 1985. The articles yielded by the search were scanned and the most suitable references were selected using the following three criteria:

1. Peer-reviewed journal;
2. Title and/or abstract indicated data relating to the psychological factors impacting on crowd behavior; and
3. Published in English.

Article reference lists were also scanned for similar studies and key authors.

The search returned a total of 753 articles from the five data bases: (1) Pubmed (99); (2) PsycINFO (131); (3) CINAHL (60); (4) ERIC (280); and (5) Academic Search Elite (183). A total of 80 articles met the criteria for inclusion. Through the review of the article reference lists, an additional nine articles were selected for further investigation. A review of the selected 89 articles indicated that 23 were relevant to the topic of this study.

### Evolution of Crowd Theories

A summary of the different crowd theories is provided in Table 1. The acknowledged founder of large group behavior theory, LeBon, along with Park and Blumer developed and perpetuated the group mind tradition.<sup>4,5</sup> They claimed that in being part of a large gathering, individuals lose all sense of self-responsibility, gain the sentiment of invincible power, become subject to contagion, and primitive behavior results. This concept of crowd behavior first was questioned by proponents of the predisposition theory.<sup>6</sup> In this tradition, collective action is explained in terms of pre-existing individual tendencies, indicating that violence arises from anti-social personalities.<sup>5</sup>

#### *Emergent Norm Theory (Turner and Killian)*

The pre-disposition theory was challenged by the Emergent Norm Theory.<sup>6</sup> The basis of the Emergent Norm Theory is that collective behavior occurs under the governance of emerging norms.<sup>5</sup> Rumor and milling movement of crowds are said to aid the emergence of new norms (emergent norms), which usually are a modification of existing norms. While the Emergent Norm Theory restores the link between the understanding of the individual and the actions of the large gathering, it fails to explain how large group unity can be achieved in a short period of time.<sup>5</sup>

#### *Inter-Group Perspective (Reicher and Potter)*

The above noted flaws in the theories of large gathering behavior have been affirmed by Reicher and Potter.<sup>7</sup> In particular, they emphasized the failure of these theories to deal with the underlying dynamic processes (such as inter-group interaction), the failure to understand the motives of crowd members, and the overwhelming emphasis on negativity. They noted the need to recognize and understand the different social-cognitive perspectives of in-group and out-group. *In-group* represents a cluster of people with a shared social norm and common purpose (i.e., supporters of a sporting team). *Out-groups* are people excluded or who do not hold the in-group's sense of social identity. Out-groups result when one group in a crowd resists another group. The obvious out-group is comprised of supporters of an opposing sporting team, but a larger in-group may form in a crowd if resistance occurs with police and hence, the police become the out-group to the crowd.

#### *Model of Disorder (Waddington, Jones, Critcher)*

Waddington *et al* further developed the understanding of crowd behavior with a six-level model of disorder.<sup>8</sup> The six levels they described were as follows:

1. *Structural*—Relative distribution of power and resources;
2. *Political/Ideological*—Activities of political institutions and pressure groups;
3. *Cultural*—Ways in which groups of people understand the social world and their place in it;
4. *Contextual*—Dynamic temporal setting including such things as rumor and media sensitization;
5. *Situational*—The special context of the gathering; and
6. *Interactional*—Actions that break the unwritten rules that govern behavior between groups.

Proponent(s)	Theory Descriptor	Theory Description
Le Bon (1885) and Park and Blumer	Group Mind Tradition <sup>4,5</sup>	Being part of a large gathering, individuals lose all sense of self-responsibility, gain the sentiment of invincible power, become subject to contagion, and primitive behavior results.
Allport, Millar, and Dollard <sup>6</sup>	Pre-Disposition Theory	Collective action is explained in terms of pre-existing individual tendencies, indicating that violence arises from anti-social personalities. <sup>5</sup>
Turner and Killian <sup>6</sup>	Emergent Norm Theory <sup>6</sup>	Collective behavior occurs under the governance of emerging norms. <sup>5</sup> Rumor and milling movement of crowds are said to aid the emergence of new norms (emergent norms), which usually are a modification of existing norms. While Emergent Norm Theory restores the link between the understanding of the individual and the actions of the large gathering, it fails to explain how large group unity can be achieved in a short period of time. <sup>5</sup>
Reicher and Potter (1985) <sup>7</sup>	Inter-Group Perspective	There is a need to recognize and understand the different social-cognitive perspectives of the in-group (resembling other members of the same group in some ways) and the out-group (another group with opposing or different attributes).
Waddington, Jones, Critcher (1987) <sup>8</sup>	Model of Disorder	The six levels of disorder are described as follows: 1. <i>Structural</i> —Relative distribution of power and resources. 2. <i>Political/Ideological</i> —Activities of political institutions and pressure groups. 3. <i>Cultural</i> —Ways in which groups of people understand the social world and their place in it. 4. <i>Contextual</i> —Dynamic temporal setting including such things as rumor and media sensitization. 5. <i>Situational</i> —The special context of the gathering 6. <i>Interactional</i> —Actions which break the unwritten rules that govern behavior between groups. Disorder is rarely pre-meditated, but is explicable and at least partially predictable.
Turner, Oakes, Haslam, McGarty (1994) <sup>9</sup>	Social Identity Theory	Based on self-categorization theory expounded by Turner <i>et al.</i> <sup>9</sup> the premise of which is that collective behavior and social influence only are possible on the basis of shared self-categorization or shared sense of identity.
Reicher (1996) <sup>10</sup> and Drury & Reicher (1999) <sup>11</sup>	Elaborated Social Identity Theory	This model starts by putting greater emphasis on the fact that large gatherings usually are inter-group encounters. It also examines how identity within a group may develop as a function of inter-group dynamics. Conflict arises in contexts where two groups hold incompatible and irreconcilable notions of proper social practice, <sup>10</sup> and where the action of one group is seen as violating conceptions of what is right in terms of the social identity of the other. The spread of conflict coincides with changes in the self-categorization of crowd members and that inter-group dynamics are crucial to the onset and development of crowd conflict.

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**Table 1**—Summary of different crowd theories

They concluded that disorder is rarely pre-meditated, but is explicable and at least partially predictable.

*Social Identity Model (Turner, Oakes, Haslam, McGarty)*

The next major development in the understanding of crowd mood and behavior was the development of the Social Identity Model of crowd behavior. This was based on self-categorization theory expounded by Turner *et al.*, the

premise of which is that collective behavior and social influence only are possible on the basis of shared self-categorization or shared sense of identity.<sup>9</sup>

*Elaborated Social Identity Model (Reicher, Drury and Reicher)*

The Elaborated Social Identity Model of crowd behavior was created by Reicher,<sup>10</sup> and subsequently discussed by Drury and Reicher.<sup>11</sup> This model starts by putting greater

emphasis on the fact that large gatherings usually are inter-group encounters. It also examines how identity within a group may develop as a function of inter-group dynamics. It has been observed that conflict arises in contexts where two groups hold incompatible and irreconcilable notions of proper social practice, and where the action of one group is seen as violating conceptions of what is right in terms of the social identity of the other.<sup>10</sup> Reicher also observed that the spread of conflict coincided with changes in the self-categorization of crowd members. Reicher's major conclusion was that inter-group dynamics are crucial to the onset and development of crowd conflict.

Drury and Reicher acknowledged that in addition to inter-group context, intra-group discussion and argument were important in the process of crowd members making sense of their social identity.<sup>13</sup> Several other researchers have made observations supporting aspects of the Elaborated Social Identity Model of crowd action and interaction.<sup>15,16</sup> More recent literature also suggests that empowerment plays an important role in determining crowd action.<sup>13,17-19</sup>

### Psychological Factors Impacting on Crowd Mood and Behavior

An examination of more recent studies on crowd behavior at a variety of events that utilized or confirmed recent psychological theories of crowd behavior, revealed a number of re-occurring themes. Crowd mood and behavior were acknowledged as complex phenomena influenced by social conditions, spectator personalities, and the dynamism and situational changes of the environment.<sup>23</sup>

Several other researchers have observed that supported aspects of the Elaborated Social Identity Model of crowd action and interaction.<sup>1,4,7,10,12,24</sup> It was concluded by Young that the spectators' need to establish forms of group identification (based on a wide range of factors such as racial, religious, ethnic, and team loyalties) probably was a contributing factor to crowd disorder at sporting events.<sup>15</sup> In their exploration of the development of group identification in response to anticipated and actual changes in the inter-group hierarchy, Doosje *et al* used a laboratory situation to conclude that the degree and nature of expressions of solidarity were dependent on the degree of identification with the group.<sup>16</sup> An investigation into the bias of in-group and out-group evaluations among sport spectators indicated that situations involving threat to one's social identity enhances bias and that the greatest bias was exhibited by the most highly identified fans.<sup>25</sup>

It is clear that crowd behavior must be understood as inter-group interaction and the different perspectives of in- and out-group must be recognized. There are major differences among the approach of out-group, such as police, compared to crowd members' accounts of events, reveals the latter group focusing on meaningfulness of crowd action. Crowds were more likely to become involved in conflict when conflicting behavior is deemed legitimate because out-group behavior is seen to violate proper social practice or when conflict is considered to be an effective way to meet desired ends. The spread of conflict was related to the degree of change in self-categorization of social identity

and when the out-group fails to differentiate between groups within the crowd. Inter-group dynamics are crucial to the onset and development of crowd conflict.<sup>26</sup>

The phenomena of empowerment experienced by individuals and sub-groups within the crowd also was identified as having a significant influence on crowd mood and behavior.<sup>14,17</sup> In a thematic analysis of a range of data, including 29 interviews of protesters at the town hall, anti-poll tax demonstrations, it was suggested that feelings of power increased among crowd members due to more inclusive categorization among them, that resulted from their perceived illegitimate exclusion from the town hall.<sup>17</sup> The empowered action of crowd members was limited by their shared definitions of "proper practice" (the social norm). Drury and Reicher observed that as crowd members perceived that they were being treated in what they viewed as an "illegitimate" manner, group boundaries extended to include those who formerly may have been regarded as outsiders in the in-group.<sup>13</sup> This extension of group boundaries led to a sense of empowerment. A study of the discourses used to discredit crowd action, such as in the accounts of anti-pedophile crowd actions in Britain in 2000, reported that individuals endorsing reactionary ideology have little power to act, but collective support enables people to put their beliefs into action.<sup>17</sup> In other words, the crowd empowers.

In recent publications, the phenomenon of empowerment in collective action was investigated.<sup>18,19</sup> Collective self-objectification (the process by which people assign meaning to themselves) is a key contributor to the empowerment arising from group action.<sup>18</sup> An ethnographic study of two crowds concluded that the experience of empowerment is a function of the extent to which collective self-objectification takes place.<sup>19</sup>

In a study using simulation models of standing spectator waves (Mexican Wave), Farkas *et al* suggested that a wave is evoked by the simultaneous excitation of a small group, a critical mass being required to trigger the wave.<sup>27</sup> This has potential for assisting our further understanding of mass gathering mood and behavior and has implications for a greater understanding of the conditions under which small groups may control violent masses.

### Measuring Crowds

There has been limited application of models to gauge crowd behavior.<sup>2</sup> Crowd mood has been described as an impacting factor on the medical workload at mass gatherings,<sup>2,3,30</sup> but the significance of this and practical applications to monitor and measure crowd mood have received limited attention.

In the UK, a matrix to calculate the resources required to support a public event uses the audience profile as an indicator of crowd.<sup>31</sup> The descriptors include the mix of family groups, the presence of young adults, children, and teenagers; the elderly; and rival factions. Crowd types at mass gatherings have been described by Emergency Management Australia, with the key descriptors including movement, participation, and behavior (Table 2).<sup>20</sup> A different tool also was designed by Pines and Maslach to assess crowd behavior.<sup>21</sup> Their tool proposed a grading of the amount of verbal noise, physical movement, and audience participation.<sup>31</sup>

Crowd Type	Comment
Ambulatory	Walking, usually calm
Disability/Limited Movement	Crowd has limited or restricted movement; requires additional planning
Cohesive/Spectator	Watching specific activity
Expressive/Revelous	Emotional release, for example, community fun runs
Participatory	Involved in actual event, for example, pickets, marches
Aggressive/Hostile	Initially verbal, open to lawlessness
Demonstrator	Organized to some degree, for example, pickets, marches
Escape/Trampling	Danger may be real or imaginary
Dense/Suffocating	Reduction of individual physical movement
Rushing/Looting	Attempt to acquire/obtain/steal something, for example, tickets
Violent	Attacking/terrorizing

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**Table 2**—Crowd types *Source: Emergency Management Australia 1999, p 79*

Based on the work of Pines and Maslach,<sup>21</sup> a study measuring emergency services workload at mass gatherings involved the development of a simple matrix to measure crowd mood.<sup>22</sup> The mood of the crowd was classified as passive, active, or energetic (Table 3). Through this process, crowd mood was found to be an important factor impacting medical workload, but was not significant for other emergency services such as police, fire, and rescue.

### Discussion

The psychological literature on crowds has highlighted that there are two common factors leading to undesirable crowd behavior. First, there must be a “seed”, an individual or small group who attempts to engage the crowd or take action that the crowd wishes to join in with. Second, the crowd engages with a seed and abnormal crowd behavior results. Engagement of the crowd requires people to modify the existing norms and have a shared sense of identity. Aberrant behavior of a crowd emerges because of the existence of two groups who hold different notions of norms or what is right: these may be different sporting team supporters or an in- and out-group such as the crowd and police.

Crowd psychology theory relating to seed behavior is based on two premises: (1) on the notion changing norms of people within the crowd; and (2) on the establishment of in- and out-groups. Much of the research has been conducted using simulated exercises or observational analysis and focuses on the interaction between groups within the crowd. There is an emerging body of applied work describing seed behavior in mass-gathering settings as unauthorized actions from a small number of individuals.<sup>32</sup> Further

research is required to understand intra-group dynamics both with crowds, but also in in-groups and out-groups such as with security or police.

While seed behavior probably is present at most mass gatherings, there is a need for broader engagement in the behavior. Human waves (Mexican Waves) at sporting events are an example of this crowd engagement. Kemp uses the term “collective behavior”, which results from a large part of the crowd following the lead of the small group of individuals undertaking unauthorized actions.<sup>32</sup> Research focusing on crowd engagement as a mitigating element of aberrant crowd behavior is a key opportunity to identify changes in crowd behavior in order to intervene.

Preparation and planning of mass gatherings provides an opportunity to identify at-risk crowds. The implications for emergency service provision is that there is a need to develop models to monitor the presence of seed behavior and limit broader crowd engagement. These models must include emergency service personnel education, the development of tools and techniques, and the mechanisms to limit crowd engagement.

There are opportunities to predict seed behavior. These have been identified under the traditional factors that influence emergency services workload.<sup>3</sup> Key elements include the excessive consumption of alcohol, the emergence of pack or hooliganism behavior, and signs of individual aggression. The potential and actual presence of these elements should be an integral part of the pre-event risk assessment, be included in the crowd assessment and monitoring procedures, and be supported by clear guidelines to manage aberrant behavior.

Mood Descriptor	Crowd Descriptor
Passive	Little or no talking Little or no physical movements Little or no physical contact Little or no audience participation Cooperative
Active	Moderate degree of talking Moderate degree of physical movements Moderate degree of physical contact Moderate degree of audience participation Cooperative
Energetic	Considerable degree of talking Considerable degree of physical movements Considerable degree of physical contact Considerable degree of audience participation May be episodes of violence

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Table 3—Crowd mood classifications

Similarly, the pre-event risk assessment for potential seed behavior should influence the need for design elements to limit crowd engagement and development of appropriate crowd behavior management strategies where required. One obvious factor is the level of policing and security that must be implemented. There is a need to visibly enforce “house rules” to limit the opportunity for seed behavior to become collective behavior.<sup>32</sup> Another strategy to consider is the site layout, including the presence or absence of containment structures and the number and type of access and egress points.<sup>29</sup> Rigorous communication systems are required for public announcement and inter-agency communication. This includes clear signage to guide crowd movement,<sup>32</sup> including evacuation points, highly visible staff and stewards, audible public address systems,<sup>29</sup> and compatible interagency communication channels. These physical requirements must be supported by clear guidelines to direct crowd management practices should crowd engagement escalate.

The emergence of a clearer understanding of crowd behavior at mass gatherings has highlighted a number of opportunities for increasing public safety. Developing systems that can assess and monitor crowd behavior at mass gatherings is an important first step. This includes the identification of seed behavior and crowd engagement. These systems must be supported by the presence of a crowd as a factor in the pre-event risk assessment. In addition, the development of guidelines to empower appropriate interventions to manage changing crowd behavior at a variety of levels would assist in managing crowd behavior outcomes.

#### *Gaps in Knowledge*

The investigation of the psychological factors influencing crowd mood and behavior has raised a number of issues relating to how this topic can be studied further and what issues require further investigation before this complex field can be understood more fully. Several researchers point to the need to explore a greater variety of situations, including those not known for violence, and to extend studies to

include a broader representation of participants in order to establish greater application of the findings.<sup>18,33,34</sup>

The empowerment of participants in crowd actions also needs further investigation. In particular, the factors that lead to the endurance of empowerment,<sup>11</sup> including the ability to explain their own feelings of empowerment and hence, their readiness to take part in future collective actions. Do participants actually refer to experiences that can be conceptualized as collective self-objectivization? Another gap is the subjective importance of the experience of collective self-objectification in comparison to other possible sources of empowerment such as unity, support, self-sacrifice, and knowledge.<sup>19</sup>

It has been suggested that progress in the understanding of mood and behavior is dependent on an investigation of how emotions relate to the self-understanding of crowd members.<sup>5</sup> The role of emotion in the collective empowerment process has been further considered,<sup>19</sup> however, it is clear that further understanding of this is needed.

An investigation of the bias of in-group and out-group sport spectators raises several questions, including the greater bias observed in the fans of the winning team, an example of discriminatory bias being used to reinforce membership of a successful group.<sup>25</sup> There is a need to identify the specific areas of threat to social identity resulting in the greater bias displayed by highly identified fans, and are these elements applicable to other sports and other locations. It also is believed that further work still is required to confirm and specify the links between social context and psychological function, and hence, to confirm the Social Identity Theory as a truly integrative theory of inter-group conflict.<sup>35</sup>

There is a need to ensure translation of psychological theory of crowds to the practical management of crowd behavior at mass gatherings. This includes clarity of factors that impact crowd mood, the incorporation of these factors into measurement models, and the exploration of ways changes in crowd mood can be managed. Identifying how measures of crowd mood can be learned by emergency ser-

vice personnel and applied at events for predicting crowd type and identifying changes in crowd mood that may impact crowd behavior, remains a key goal.

### Conclusions

The literature on the psychological factors of crowds highlights a large theory practice gap in the setting of mass gatherings. This is further hampered by the language and context in which crowds have been studied. This literature review has revealed that there are two important elements of crowd behavior in mass gatherings: (1) for crowd behavior to change, there must be a seed, a divergence from normal behavior; and (2) that people must engage in the aberrant behavior. This provides three opportunities to manage crowds through: (1) assessment and monitoring in the both

the pre-event and during event phase; (2) identification and management of seed behavior; and (3) containment of crowd engagement. More research is required regarding the development of crowd behavior in mass gatherings and the development of practical tools and techniques to change crowd behavior outcomes.

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