Crowds at Outdoor Music Festivals:
An Examination of Crowd Psychology and its Implications for the Environmental Health Practitioner

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Outdoor music festivals (OMFs) attracting large crowds are commonplace in Australia. These crowds are different from others because they are emotionally charged, highly motivated and somewhat unpredictable. Problems in these crowds do occur. To prevent or limit the effect of these problems it is necessary to plan the event well and ensure that planned actions are implemented by undertaking comprehensive monitoring programs. Environmental Health Practitioners (EHPs) contribute to these programs through monitoring public health outcomes at OMFs and crowd safety is the responsibility of other professionals. EHPs working at OMFs are in an environment where the crowd impacts on every aspect of the event and would benefit from an understanding of the workings of crowds. This article provides an introduction to crowd psychology and discusses key factors such as demographic characteristics, crowd movement, artists, performances, and alcohol consumption that all potentially affect collective behaviour within crowds. This paper continues the discussion commenced in Earl, Parker and Capra (2005) in an earlier issue of this journal where the role of EHPs in event planning was presented.

Key words: *Outdoor Music Festivals; Crowds; Crowd Behaviour; Sociological Theories*

Outdoor music festivals (OMFs) attracting large crowds are commonplace in Australia. These crowds are different from those at many other events as they tend to be emotionally charged (Tatrai 2001), highly motivated (Raineri & Earl 2005) and somewhat unpredictable (Davis & Associates 2004). Behavioural problems within these crowds can typically result when there are disruptions in the flow of pedestrian traffic caused by obstructions like queues forming in their path (WA Department of Health 2005), because of a perceived threat such as a crowd crush (Emergency Management Australia [EMA] 1999), or during a competitive rush for a prime position or prized item (Fruin 2002; Tatrai 2001). In order to minimise these problems it is important to get the layout of the event right.

Getting the layout right for an OMF means designing the site to allow easy crowd movement by providing good pedestrian routes and entry/exit points; having gathering points and viewing areas suitable for the size of the event; supplying sufficient facilities such as toilets, food outlets, bars and welfare facilities dispersed appropriately within the site; and servicing the event with an adequate number of skilled and experienced event staff including security personnel (Au et al. 1993). Getting the mix of these features right is difficult and is best achieved by thorough, effective and comprehensive planning prior to the event (EMA 1999; Tatrai 2001). Equally as important is ensuring that planned actions are implemented.

An EHP from the Mendip District Council that licenses the Glastonbury Festival in the United Kingdom (UK), said that it was critical "to establish and maintain a presence through professional and comprehensive monitoring of the event" (Earl, Parker

& Capra 2005, p. 60). This monitoring usually involves multidisciplinary teams that include Environmental Health Practitioners (EHPs). EHPs within these teams generally focus on food safety, sanitation, potable water supplies, noise and waste management all of which are compatible with EHP's knowledge and skill sets. This monitoring work is undertaken in an environment where crowd behaviour influences every aspect of an event. Consequently, there is merit in EHPs gaining a fundamental understanding of how these crowds work and the various factors that can influence their behaviour.

The purpose of this article is to continue the discussion commenced in Earl, Parker and Capra (2005) where the role of EHPs in event planning was presented. The article provides EHPs with a basic understanding of crowds and other factors influencing crowd behaviour. The information is supported by contemporary literature.

An Understanding of Crowds at OMFs

Macionis (2004, p. 605) described a crowd as "a temporary gathering of people who share a common focus of attention and who influence one another". As stated above, these particular crowds are known to be highly emotional. Paulus (1980), an environmental psychologist, explained that the level of emotion is related to the density of people within that crowd. In that, as crowd density increases, the intensity of an individual's moods and behaviours increases (Freedman 1975). This level of emotional intensity has been used to describe different types of crowds that might be encountered, which are:

- casual crowds - people who happen to be in the same place at the same time with only brief interaction if any, such as shoppers in a mall;

- conventional crowds - people who have come together for a scheduled event and share a common focus, such as graduation ceremonies;

- expressive crowds - people who are releasing their pent up emotions with others who share similar emotions such as a football grand final; and

- acting crowds - people so intensely focused on a specific purpose or object and on the verge of violent or destructive behaviour, such as those associated with mobs, riots or panic driven crowds (Blumer cited in Kendall, Murray & Linden 2000).

Casual, conventional and expressive crowds can be observed regularly at OMFs and on very rare occasions, acting crowds can also be seen. A famous example of extreme crowd behaviour occurred during the 1999 Woodstock festival in America where 500 festival goers rioted, lighting fires, looting vendor tents, smashing ATM machines, and toppling toilets and speaker towers (Vider 2004). The change in crowd behaviour that results in problems such as riots or stampedes is a sequential process.

Put simply, the behaviour change process commences with a failure of some aspect of the social system affecting the crowd, such as running out of alcohol. Individuals, sensing there is a problem, analyse inputs and observe reactions within the crowd; a common belief begins to form and spreads throughout the crowd; the crowd becomes more organised; and finally is mobilised into action (EMA 1999). It is these collective crowd behaviours that are of particular interest.

Social scientists have had moderate success in explaining collective behaviours, especially participation in extreme behaviours like rioting or looting. Vider (2004) said that understanding the relationship between the individual and the crowd was important. There are a number of sociological theories which have been developed to provide insight into this relationship - the Contagion,

Convergence and Emergent-Norm (EMT) theories and the Social Identity Model (SIM) of Crowd Behaviour.

Sociological Theories Associated with Crowd Behaviours

The *contagion* theory, posed by LeBon (1960), has been frequently referenced in event safety literature (e.g. Davis & Associates 2004). Le Bon (1960) believed that being in a crowd has a hypnotic effect and that, with the anonymity of belonging to a large group, individual personalities vanish. A collective or group mind then emerges along with irrational, emotionally charged behaviour (LeBon 1960; Vider 2004). This theory only focuses on the collective aspect of the crowd and discounts the actions of individuals within the crowd (Vider 2004).

Critically, more recent authors have comprehensively rejected Le Bon's group mind idea along with the notion of individuals being anonymous, irrational and emotional (Levy 1989; McPhail 1989; Reicher 1987). McPhail (1989) said that individuals in crowds typically assemble with friends, acquaintances or family members, which discounts the anonymity perspective. Schweingruber and Wohlstein (2005) added that there is no evidence to support individuals within crowds suffering any cognitive deficits. Finally, Couch (1968) argued that emotions are part of all social interactions including those associated with being in a crowd. Emotions and rational behaviours are not mutually exclusive and being emotional does not necessarily lead to irrational behaviours (Massey 2002; Schweingruber & Wohlstein 2005).

At the opposite end of the spectrum, the *convergence* theory maintains that crowd behaviour develops due to individuals with a shared predisposition or like-minded individuals converging at the same place (Fogiel & Goldstein-Fuchs 2000; Levy 1989). This theory stemmed from early work by Sigmund Freud and Floyd Allport and the later works of Neal Miller and John Dillard (Levy 1989). In applying this theory, crowd behaviour is considered to be rational or premeditated with individuals just expressing existing beliefs and values (Macionis 2004). This theory was not popular and was heavily criticised for "not having a structured framework or explaining critical aspects of crowd dynamics such as behavioral shifts, multiple predispositions or role acquisitions" (Levy 1989, p. 70).

There is also the *emergent-norm* theory or EMT posed by Turner and Killian (1987). The EMT combines aspects of the two previous theories, arguing that it is the combination of like-minded individuals, anonymity, and shared emotion that leads to collective behaviours. In applying this theory people come together with specific expectations, beliefs and values that are changed due to interactions within crowd with new behaviours emerging as a result (Macionis 2004).

The problem with the EMT is that there is no evidence to support the emergence of new forms of behaviour just from being in a crowd (Couch 1968; Schweingruber & Wohlstein 2005). Waddington and King (2005) explain, as the different groups within a crowd bring their own sets of values, beliefs and expectations with them it is unlikely that new behaviours would be adopted. On a technical note, McPhail (1991) added that the EMT lacked the specificity needed to allow it to be tested properly thus making it somewhat impractical.

The final theory to be discussed in this paper is the *social identity model* or SIM posed by Reicher (1982 cited in Drury and Winters 2004). Drury (2007) explains this theory maintains that people act as one in a crowd because they share a common social identity. Social identity is described as the part of the self-concept that results from membership in social groups (Stangor 2004). This common identity specifies the appropriate normative behaviours. The SIM recognises "that

different identities have different [normative behaviours] - some peaceful, some conflictual" (Drury 2007, p. 3). Drury and Reicher (1999, p. 383) explain:

> *Control over behaviour is not lost but rather governed by the [expectations, beliefs] and values that define [a particular] social identity. Crowd members still act in terms of self-interest, but they are different interests being based on a different and collective self.*

In applying this theory individuals categorise themselves into particular social groups such as Goths, Punks or Metal Heads. These individuals then gain an understanding of, and adopt, that group's expectations, beliefs and values which become the basis of future behaviour. Individuals usually have a variety of these social identities and each has the potential to impact on group processes (Drury & Winter 2004; Vider 2004).

The SIM has been credited with recognising the transformation of identity, not a loss of one, and the retention of an individual's decision-making abilities (Vider 2004). However, Vider (2004) commented that this theory neither explained the emergence, then spread, of the collective behaviour nor individuals becoming bystanders rather than participants.

In summary, it is evident that these theories only "address particular elements of crowd behaviour" (Levy 1989, p. 72). The *contagion* theory considers collective behaviour the result of individuals being anonymous, irrational and emotional within a crowd. The *convergence* theory explains this behaviour as like-minded individuals at the same location responding to stimuli in a simular way. The EMT says that social interactions alone are responsible for collective behaviours while the SIM attributes a shared social identity within a crowd as the cause.

Clearly, an explanation of the relationships between individuals and the crowd remains incomplete (Hogg & Abrams 1988; Levy 1989). The SIM, however, has been hailed as one of the most developed, comprehensive modern theories available, making it particularly salient. On a more practical level, there are specific characteristics of an audience and environmental factors that are known to be associated with collective behaviours.

Critical Factors Affecting Crowd Behaviour

Crowds behave and respond according to a variety of critical factors that have been summarised into audience composition, crowd related activities, the artists and performances, and physical aspects within the site (Davis & Associates 2003; UK Health & Safety Executive [HSE] 1999).

Audience composition

Turner (1995, cited in Vider 2004) observed that crowds have dynamic internal processes with social identities, group formation and shared features constantly interacting and reacting with each other. These internal processes are catalysed by a range of notable variables. Examples of these catalysing variables are being in close proximity, such as in the mosh pit; visible similarities, such as haircuts, tattoos, piercings and certain types of clothing; shared interests in the music or artist; cooperative interactions such as helping others who have fallen; or positive interdependences like supporting others to crowd surf (Turner 1995, cited in Vider 2004). It is combinations of these processes and variables that help to build a shared social identity within a crowd. A strong shared social identity increases cohesion within the crowd (Vider 2004).

Cohesion is defined as the measure of significance, importance or attachment that individuals have towards the crowd (Stangor 2004). High levels of cohesion within a crowd increase the likelihood of spontaneous socialisation (Reicher 1987 cited in Vider 2004). In the presence of the right stimuli, a critical mass within the crowd can be rapidly achieved and a change in crowd behaviour is quick to follow (Vider 2004). An example

of spontaneous socialisation is the collective reaction in a crowd to the news that a favourite artist is refusing to perform or has walked off stage early. Individuals attending OMFs have an influence on crowd behaviours (Tatrai 2004).

People attending OMFs have their own knowledge, experience and expectations and these influence their decision making prior to and during the event (Tatrai 2004). Before an event, individuals make decisions about the consumption of illicit drugs and alcohol or their behavioural intentions, when at the event their decisions might involve activities such as crowd surfing or moshing. While at the event, any changes in an individual's mental state, such as getting very drunk, or emotional condition, particularly increases in stress levels or the ability to act, can have a flow on effect to behaviour within crowds (Davies & Associates 2004). Some individuals are more noteworthy than others because they exert some influence over the rest of the crowd.

These more noteworthy individuals are collectively referred to as crowd leaders. Vider (2004) categorised these individuals into two subcategories - true leaders and exemplars. On one hand, true leaders stand out from the rest of the crowd with attributes that make them more persuasive, visible, audible, or better connected into the crowd (Vider 2004). Exemplars on the other hand, are individuals whose unique behaviours are interpreted as normative and become adopted by others (Vider 2004). For example, one person throws a bottle at the stage or starts to crowd surf and others join in. Reicher (1987 cited in Vider 2004) argued that behaviour within a crowd is generally not determined by the true leaders but by the exemplars. It is beneficial to be aware of the demographic characteristics of crowds that can impact on collective behaviours (HSE 1999).

Upton (2004) identified younger people, particularly young males as being prone to bad behaviour, such as slam dancing or moshing,

with the consumption of large amounts of alcohol or the presence of a strong social identity adding to the problem. A publication from the Danish Ministry of Culture (2000) reported that young people felt a strong sense of community when attending OMFs and that this was one of the key aspects that attracted them. Commons, Baldwin and Dunsire (1999) expressed particular concern about this sense of community as it gave individuals the confidence to experiment with new or risky behaviours, such as illicit drug taking or taking part in unsafe sex. Tatrai (2001) posed the case that events attracting a broad demographic with a balance of ages and gender would have a positive effect on crowd behaviours.

Crowd related activities

The crowd related activities that are of interest include moshing, slam dancing, crowd surfing, 'swirling', and more recently 'circle pits'. Swirling is when the patrons are moving in a circular motion drawing in more and more people to the swirl (WA Department of Health 2005). A circle pit is where a human circle is formed and pairs of individuals take turns to enter the cleared central area and slam and bash each other. This activity is also known as 'fight dancing'.

The primary focus for most crowd related activities is the 'pit' or 'primary pit'. This is the area at the front of the stage in direct view of the performers. Upton (2004) a crowd management specialist from the UK, reported that this part of a crowd, usually only about 5% of the total capacity, generate up to 75% of the energy released during an event. Upton (2004) added that providing good controls for this area takes considerable resources, however, it does allow the rest of the crowd to relax and enjoy themselves.

It should be noted that many references describing the primary pit area use another term - mosh pit. Mosh pits are a little different and can occur anywhere within a crowd often

involving much larger numbers of people. Ambrose (2001, p. 3) explained that "there are certain acts...where the mosh pit extends to the entire auditorium or field where they are playing". Consequently 'mosh pit' should be considered any place where moshing occurs within a crowd.

The availability and consumption of alcohol by festival goers at OMFs can have an influence on crowd behaviour. Wertheimer (1993) highlighted this when discussing the findings of a large survey of event professionals in the United States. Seventy percent of the respondents in that study reported alcohol consumption as the major risk factor that had to be managed at their events (Wertheimer 1993). Allsop, Pascal and Chikritzhs (2005) warned that it is difficult to predict the effects of alcohol consumption on any group. Drunken males were identified as potentially problematic, especially in relation to aggressive types of behaviour such as fight dancing (Allsop, Pascal & Chikritzhs 2005). It should be noted that the relationship between alcohol consumption and aggressive behaviour is complex and influenced by a range of social cues including (i) aggressive music or an antagonistic performer (Parker & Auerhahn 1998); (ii) the expectations, characteristics, values and attitudes that individuals have (Allsop, Pascal & Chikritzhs 2005); and (iii) any changes to an individual's perceptions, motor skills, emotions or cognitions (Allsop, Pascal & Chikritzhs 2005).

Finally, there is increasing evidence that the use of illicit drugs, such as cocaine and methamphetamine, are also having an impact on crowd behaviours at OMFs and other events (see e.g. Earl et al. 2004; Vider 2004).

Artists and performances
The dynamics within a crowd can be particularly influenced by the character and actions of the artists and the type of music being performed (Hill 2002). Fruin (2002) reported that artists cancelling shows at late notice, late starts, walking off stage early, diving into the audience, throwing souvenirs and encouraging inappropriate or hazardous group reactions, all have negative effects on crowd behaviours.

In terms of performances, a study undertaken by Earl et al. (2004) found the type of music being performed, especially heavy metal, punk rock and rap performances, was a significant influence on crowd behaviour. In particular, it was the tempo, rhythm and recognition of songs that triggered behaviour change within the crowd.

Physical aspects within the site
There is usually considerable crowd movement within an OMF (Raineri 2004). Consequently, physical restrictions within the site might contribute to disruptions of normal pedestrian traffic flows. These disruptions might be the result of an obstruction left in a pedestrian route, closed gates or doors, patrons stopping to view street art or other attractions, or queues forming for an attraction or ride (WA Department of Health 2005). There might also be problems associated with the seating or viewing arrangements. These problems could be associated with seat availability, aisle widths, marshalling areas, relative locations of food, alcohol or merchandise outlets and toilets, or the distribution and timing of performances. The number of stages at an OMF might also create problems for patrons because of their relative locations, accessibility, visibility or audibility and the types of barrier systems used (EMA 1999; HSE 1999; Raineri & Earl 2005; Tatrai 2004; WA Department of Health 2005).

Observers often compare crowd movement to a fluid-like flow. Fruin (cited in Davis & Associates 2003) warned that crowd densities need to be as high as seven persons per square metre and higher to appear as a fluid mass. For example, during the Hillsborough football stadium disaster where a number of deaths occurred, crowd densities were considered

to have reached 11 persons per square metre where the bodies were found. Consequently, limiting crowd densities becomes critical (Fruin cited in EMA 1999; Raineri 2004).

Fruin found "critical crowd densities are approached when the floor space per person is reduced to about $0.5m^2$" (Fruin cited in EMA 1999, p. 91). This figure has been recommended by some guidance publications such as the HSE event guide for the calculation of crowd densities at events. HSE explains, the maximum number of people who can safely be accommodated in an open field can be calculated by dividing the total area available to the audience (in m^2) by 0.5 (HSE 1999). The WA Department of Health argues that acceptable crowd densities can also be derived from calculations as low as $0.3m^2$ per person (2005). However, Tatrai (2004) advised there was limited legislative or good practice guidance to support higher density calculations than those recommended by Fruin.

Kemp, Hill and Upton (2004) argued strongly that using Fruin's method to calculate crowd densities fails to consider how space is interpreted with festival goers choosing to sit, lie or move around the site as apposed to just standing in one place. Disregarding the warning from Kemp, Hill and Upton (2004) could result in emergency response difficulties for medical and security staff deep within crowds.

Implications

There are many public health issues that can result from poor crowd management. Individuals could slip, trip or fall in a crowded area that could result in them being trampled or worse. The rapid uncontrolled movement of large numbers of people similar to a stampede, or alternatively crowd surges that are slow rather than quick also cause problems. Additionally, people might be crushed against objects, such as a fence or wall that breaks, resulting in a crowd collapse, and person against person crushing

caused by gross overcrowding, or the opposing movements of people within a confined area, can all result in public health issues (Davis & Associates 2003).

In order to manage the effects of crowds and reduce crowd related incidents, Tatrai (2004), an Australian event security and risk management expert, advised that crowd management needs to be effective, well planned and expertly implemented. Tatrai termed this 'safety by design' (Tatrai 2004). To achieve this (i) the site should allow good access and crowd movement, have effective segregation where needed and be an adequate size; (ii) have emergency management plans; (iii) have a variety of methods to communicate with the audience; (iv) utilise alcohol management strategies; and (v) have appropriate security services suitable for the type of event and expected audience (Tatrai 2004).

Many crowd safety issues arise in the main viewing areas of OMFs due to the large numbers of festival goers in attendance with the audience generally standing rather than being seated. There is specific concern directed at controlling the small percentage of the crowd in front of the stage. This control is critical as this is an area of extreme crowd pressures (Upton 2004). As a general rule of thumb, Upton (2004) recommends that the main viewing areas are divided into zones that are colour coded or numbered and separated using a safety barrier system. Each zone would have separate entrances, exits, emergency evacuation systems and be self-contained in terms of concessions and welfare services (Upton 2004).

Critically, each zone needs to be assessed individually as key features will differ for each. Upton (2004) said that the following should be considered for each zone:

- there needs to be a realistic approach to the establishment of crowd capacities and densities for each zone;

- sight lines for the audience will vary for each zone. The focus for the first zone will be the artists and the stage, while it is likely to be video screens for the other zone;

- the condition of the ground will need to be considered with regard to the degree of incline, drainage, condition of the grass, locations of hard standing features and the impact all these features might have on the crowd;

- the expected crowd behaviour, such as crowd surfing and moshing, the intensity of the performance and artists' known actions, all need to have been considered within the planning processes;

- rescue teams might need to reach, triage and extract casualties and remove them safely from any part of the crowd. As a result, there needs to be adequate medical and security staff on hand that reflects the intended audience numbers for each zone. There also should be strategies in place to assist these staff to do their work if the need arises;

- trained and experienced crowd managers need to be appointed to coordinate crowd safety activities for each zone;

- tickets should clearly indicate which zone they are for.

The use of the multi barrier system known as the "D" barrier system as highlighted in the WA Department of Health (2005) event guide is a good example of a method to implement Upton's recommendations. This system involves the installation of a straight safety barrier across the front of the stage surrounded by a curved barrier that includes the 'front of house' mixing structure to form the 'D' shape. The WA Department of Health (2005) insists that the capacity of the area within the 'D' should be strictly limited to $0.4m^2$ per person and must be closely supervised. This approach has been utilised for a number of large events in Australia.

Conclusion

OMFs present unique challenges in terms of the safety and management of large crowds. EHPs have a role in the monitoring of OMFs and as crowds impact on every aspect of these events there is merit in gaining a fundamental understanding of crowds to assist them with this work. This article provides an overview of the nature of crowds and discusses the key factors influencing collective behaviour. Key factors covered include leadership within the crowd, demographic characteristics, crowd movement, artists, performances, and alcohol consumption. These all have the potential to affect collective behaviour within a crowd.

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