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COMMUNITY MAPPING AND CREATING SAFE SPACES FOR PHYSICAL ACTIVITY IN A SOUTH AFRICAN CONTEXT OF RELATIVE POVERTY

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ABSTRACT

This research emanates recreational physical activity, within a South African context of poverty, where safety is a key consideration. The study drew upon established socio-ecological models to assess critically available spaces that are currently being used for physical activity within the impoverished community of Mamelodi East, Ekurhuleni municipal district. The utilisation of such spaces was both asset-based and solution driven. A multi-method research design was used for a larger study. This article draws on the qualitative data collected through 16 interviews from school, stakeholder and community representatives related to four primary schools in close proximity of a community sport facility. In the first phase of data collection, 80 grade six boys and girls (participants and non-participants in sport) and nine sport coaches participated in group discussions. In the second phase, six community maps were drawn profiling four schools, a faith-based organisation and community facility for reflective discussions with focus group participants and interviewees. The third phase included an overlaying of 60 maps associated with the research cohort, age and gender, including the verification of 'hot spots'. The analysis revealed that spaces simultaneously exist on a continuum of safe and unsafe in articulation with supportive and unsupportive environments. This culminated in an explanatory framework of physical activity, school sport and informal play activities.

Keywords: Safe spaces; Environment; Community mapping; Physical activity.

INTRODUCTION

Spaces present the underlying foundation of human survival and influence the way humans adapt to their environments, whilst also creating safe spaces conducive to their ways of living (Hublin, 2015). The global concern for safety and safe spaces have played an important role in shaping contemporary urban and built environments (Watson, 2009). International, national and local policy frameworks identify safety as a fundamental human right and access channel to dimensions of other rights captured in sustainable development goals and strategies (UN General Assembly, 2006; NPC, 2012; Munoz & Dimov, 2015). Therefore, without the provision of safe environments, development objectives, and ensuring basic human rights may be difficult to achieve (Backe *et al.*, 2012; Stretenović, 2013; Taks & Misener, 2015). As a multidimensional concept, safety manifests itself in different ways in different contexts (Stodolska *et al.*, 2009; Elvik & Bjørnskau, 2017). The complexity of safe spaces translates

into multiple and interrelated aspects that include the psycho-social, socio-cultural, socio-economic and policy dimensions (Spaaij & Schulenkorf, 2014).

Specifically, safety policies are a directive for promoting safe conduct and decreasing a sedentary lifestyle (Backe *et al.*, 2012; Munoz & Dimov, 2015). Although policies may not be directly effective within society itself, the lack of adherence to policies (such as inaccessible spaces or poorly maintained sport facilities or open spaces) may affect perceptions of safety and consequential utilisation of such spaces for physical activity negatively (Gay *et al*., 2010). Physical environments, therefore, can influence the behaviours and perceptions of the safety of people through urban design, evident in the number of features that may facilitate physical activity (Dyment & Bell, 2007; Reilly *et al*., 2016), the quality and function of infrastructure and the maintenance of facilities and equipment (Dwyer & Allison, 2006; Watson, 2009; Brázdová *et al*., 2015). Physical environments influence the safety perception that reciprocally influences levels and types of physical activity participation within the community contexts (Granner *et al.*, 2007). Such perceptions rely on indigenous or local interpretations of experiences of safety and potential levels of vulnerability in a particular social setting (Stodolska *et al.*, 2009; Swanepoel & De Beer, 2011).

An unsafe environment accounts for high levels of physical inactivity that contribute to a high incidence of non-communicable diseases related to a sedentary lifestyle. Worldwide physical inactivity has accounted for 14% of premature deaths associated with diseases, such as high cholesterol, diabetes, high blood pressure and obesity (Biswas *et al.*, 2015; Norheim, *et al*., 2015). In relatively impoverished urban environments, spaces and safety represent concepts that need to be analysed as integrated, multi-faceted phenomena, which potentially may serve to address social ills through the active prevention of and intervention into non-communicable diseases related to sedentary lifestyles (Brázdová *et al.*, 2015; Norheim *et al.*, 2015). As a multifaceted phenomenon, safe spaces can exist in several dimensions that include, but is not limited to, policy, physical, environmental, socioeconomic, cultural and psychosocial phenomena (Parker, 2006; De Beer & Swanepoel, 2013; Spaaij & Schulenkorf, 2014).

It is against this fundamental reality that research investigates the interrelated manifestations and local conceptualisation of the safety of spaces, whilst producing strategic insights for stakeholders and addressing the optimal utilisation of space for a physically active lifestyle (Watson, 2009). The socialisation process shows differential dynamics associated with different degrees of perceived vulnerability (gender identification) and risk-taking (age and gender) where adolescent boys and men are relatively more prone to freedom of movement compared to their female counterparts (Sjoberg, 1998). The social construction and action for "safe conduct" finds expression in social learning through parental guidance, peer influences and popular or public knowledge (Bandura, 1986).

The socio-political dimension of socially constructing safe spaces relates to the political landscape constructed by Apartheid policies (1948-1994) in South Africa (Swanepoel & De Beer, 2011). During the Apartheid era, "White" urban spaces were prioritised for planned development and provision of good quality, accessible sport facilities (Smith, 2001). Such demarcated development is still evidenced in the relative lack of physical infrastructure in most resource-poor townships with associated effects on physical activity levels of local inhabitants (Coakley & Burnett, 2014). Watson (2009) argues that the process of democratisation itself created spatial divides in post-Apartheid South Africa because of the new political landscape it created. South Africa's transition to democracy brought with it advances in bridging political, social and economic divisions, but spatial divides associated with class segmentations still forms part of the current landscape (Christopher, 2001; Keim, 2004). Intra-country migration

patterns can be partly contributed to the removal of the restrictions of movement for black Africans (Meyer *et al*., 2016). However, increased urbanisation and a dense building environment may negatively influence safety and environments being conducive for active recreational activities.

In 2014, a study by the International Society for Physical Activity and Health (ISPAH) found that about 50% of RSA children are not meeting the recommended standards of physical activity. Thus, the need for dedicated, safe, enabling environments for physical activity becomes a societal concern as the RSA urban population grows larger (UNESCO, 2016). With this in mind, policies and spatial development planning should take into account factors that promote and prevent sedentary lifestyles. Other factors to consider, include those that promote (protective factors) and prevent (risk factors) physical activity, so that broad societal strategies can address the root cause of many non-communicable diseases by creating environments and spaces that are both safe and conducive towards physical activity (Dyment & Bell, 2007). Understanding the different factors involved in the development of safety policies is vital to the successful creation and utilisation of safe spaces (Stretenović, 2013).

The majority of the research contributing to the existing body of knowledge of safe spaces stems from the global north within a specific context (Xethali *et al*., 2009; Brázdová *et al*., 2015; Reilly *et al*., 2016). While some aspects of this research can be extrapolated to similar township communities, limited empirical evidence exists for cross-setting studies within South Africa and African societies (Oyeyemi *et al*., 2013). The value of this research lies in the process of capturing indigenous knowledge and reflection through community mapping that allows for an inductive approach and insights from a grounded theoretical perspective (Glaser & Strauss, 1967; Corbin & Strauss, 1990).

PURPOSE OF THE STUDY

This study explored how local residents from an impoverished South African township view and are socialised into the use of spaces that show complex and inter-related mechanisms associated with their perceptions, responses and multiple inter-related dimensions of safety.

METHODOLOGY

Ethical clearance

This study received ethical clearance from the Research Ethics Committee of the Faculty of Health Sciences at the University of Johannesburg (REC-01-258-2015) and adhered to strict ethical conduct throughout the research by obtaining written informed assent and consent for all interviews and focus groups.

Research design

The proposed research design and participative research approach required triangulation through mixed methodologies so as to accommodate and validate the socially constructed perceptions of different research cohorts, namely young children, youth leaders, significant others like teachers and parents, as well as stakeholders responsible for ‘community safety’, such as the police, community ground caretaker and the NGO offering sport activities. The research participants were recruited purposively to include four primary schools as social institutions in close proximity (within 15-minute walking distance) to a community sport

facility in a Mamelodi East township, Ekurhuleni municipal district within the greater Pretoria area.

The Asset Based Community Development approach guided the utilisation of two main research techniques, namely participatory mapping (Allen *et al.*, 2015) and narrative mapping (Lapum *et al.*, 2015). The reflective approach of local or indigenous sense-making required research participants to regularly engage in discussing and mapping activities. This contributed to some level of limitations as multiple research visits had to be rescheduled around the availability of participants and accommodate various community disruptions, such as mass demonstrations. Only a few parents were willing or able to dedicate time without being remunerated and resulted in only a few community representatives in the study.

Participants

The rationale for the recruitment of research participants entailed the identification of children using a community sports field where a service provider (NGO) offers physical activities and other stakeholders who are indirectly involved in 'looking after children's safety in the community' (the local police and a faith-based organisation situated next to the community field). Sixteen interviews were conducted with representatives from this stakeholder cohort, including four parents who volunteered to take part in the research as per invitation from their respective School Governing Bodies. Teachers and coaches from four schools identified Grade 6 learners as possible research participants to take part in focus group discussions that included five boys and five girls taking part in sport and five boys and five girls not taking part in sport per school (n=80). Having obtained written informed consent and assent, they represented the cohort of 'children'. Nine youth coaches who offered sport activities at the community facility also took part in focus group discussions.

Management of research

The research was conducted in multiple phases. The first phase entailed the recruitment of research participants and interviews with stakeholder representatives. The second phase entailed follow-up interviews, focus groups and identification of emerging themes around safe spaces to capture by 'community mapping'. The third phase was devoted to the construction of maps by different research participant cohorts (including gender and age differentiation). The overlaying of multiple identification of safety dimensions rendered 60 individual maps to be integrated into the six constructed maps from an institutional perspective (four schools), the face-based organisation and the local police representative for the verification of 'hotspots' where collective understanding of safety, underpinned by social learning, finds expression.

Analysis of data

The data analysis was done according to a grounded theory approach (Corbin & Strauss, 1990), which led to the development of a theoretical construct that identified eight community typologies for safety and space.

Community mapping

In order to contextualise the wider physical and social structures within this community, a combination of community mapping techniques was used to inform existing knowledge from a local perspective (Parker, 2006). Through collaborative discussion, research participants (as per identified cohort) participated in map constructions and used colour variations (red, orange

and green) to indicate their safety perceptions along different routes to and from schools, their homes and the community sport facility as 'routes most travelled' (Butler-Kisber, 2010). Participants marked their safety perceptions on the map that was relevant to them with red ('I do not feel safe to walk by myself'), orange ('I do not feel safe walking by myself' or 'I feel safe only when I walk with a group') or green ('I feel safe to walk by myself') marker pen. Participants also indicated hotspots (red circles) where significant events occurred for them, thus allowing for a contextual understanding of space for that participant cohort.

Firstly, maps were constructed per consensus of different age groups (Grade 6 learners being between the ages of 10 and 12 years old), coaches (between the ages of 20 and 30 years) and community members (being older than 40 years of age). Secondly, mapping according to gender-related perceptions took place, as represented by 40 boys and 40 girls, as well as six female and three male coaches. Thirdly, mapping was done according to sport participation versus non-participation (40 children within each category). Such clustering produced 50 different maps produced by different age and gender groups, which were the key differentials. The youth coaches and children were all from the same lower socio-economic status and shared similar experiences as 'Black' citizens of impoverished township communities. Once layered (all maps together), a further seven maps emerged that showed several elements of difference, which were then verified and validated by a local police representative who was acknowledged as an expert regarding crime (unsafe) locations in this community.

RESULTS

The following figures represent the perceptions of safety as indicated by each participant cohort, indicating the different main routes within the public space domain on their way to or from home to attend school and/or participate in sport activities after school hours.

Figure 1. **PERCEPTIONS OF SAFETY: SCHOOL A, CHILDREN**

Figure 1 indicates that children felt more unsafe walking through public main roads areas (Routes A, B and E) than residential spaces (Route D). Perceived hotspots for children from this school primarily occurred around open spaces or route intersections.

Figure 2. **PERCEPTIONS OF SAFETY: SCHOOL B, CHILDREN**

It is evident in Figure 2 that children from School B perceived residential routes (Route C1-C4) to be safer than the main public routes (A and B). Route A was considered to be residential and perceived to be safer (indicated by green), whilst the other side of the same route was considered to be commercial and perceived to be comparatively less safe. Hotspots indicated by children from School B were mostly centred on intersections and open public spaces.

Figure 3. **PERCEPTIONS OF SAFETY: SCHOOL C, CHILDREN**

Perceived hotspots of crime were indicated in open public spaces by learners from School C (Figure 3). Public main roads (Route A and B) were perceived to be the least safe, whilst residential routes (O-U) were perceived to be safer. Crime hotspot areas were indicated around commercial spaces, such as informal taverns ("shebeens") (C10) and spaces, where a significant event occurred, such as rape (C4) or a kidnapping (C3), were perceived to be unsafe, long after the occurrence of such an event. The 'space' became a point of reference for life lessons for children not to 'talk to strangers' or 'walk alone in dangerous places'.

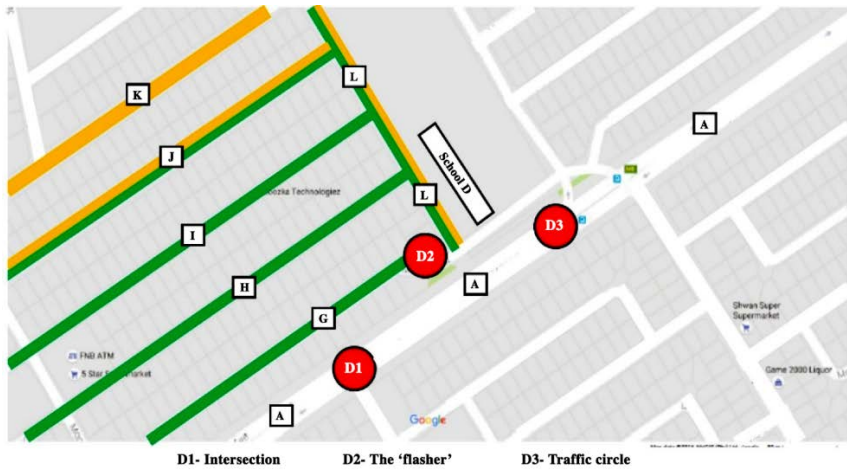

Figure 4. **PERCEPTIONS OF SAFETY: SCHOOL D, CHILDREN**

In Figure 4, it is evident that residential routes (G-L) were perceived to be generally safe. The school is situated in a predominantly residential area, and routes surrounding the school were perceived to be safe.

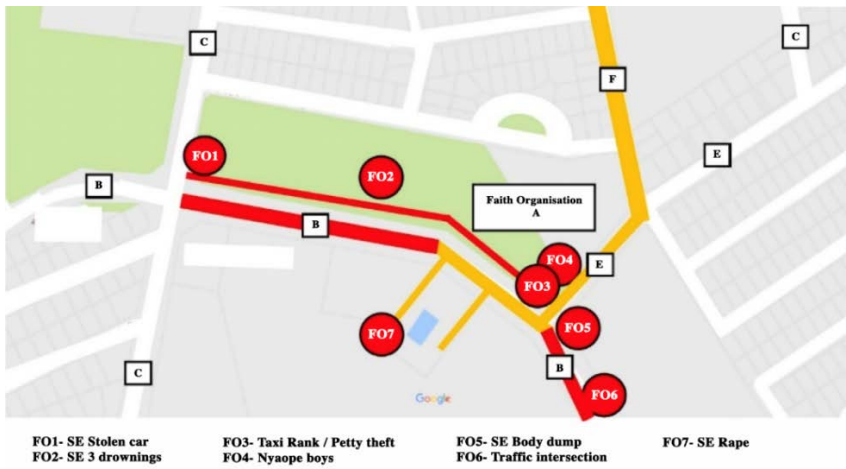

Figure 5. **PERCEPTIONS OF SAFETY: FAITH ORGANISATION A, ADULTS**

The routes surrounding open public spaces are perceived to be most unsafe as shown in Figure 5. Route E is perceived to be safer because of a security camera, which is positioned on the intersection between route E and Route B. FO2 was a significant event (drowning) that occurred in the storm drain, thus now the area is perceived to be unsafe.

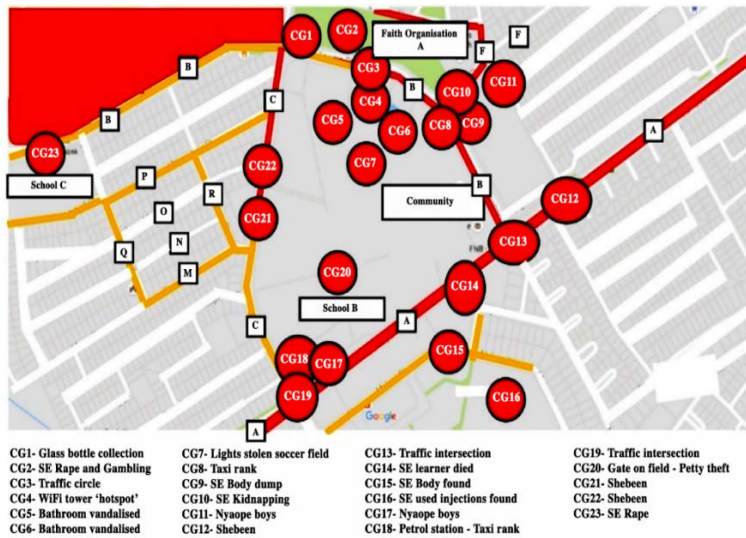

Figure 6. **PERCEPTIONS OF SAFETY AS REPRESENTED BY ADULT COMMUNITY MEMBERS**

It is evident, as demonstrated by Figure 6, that open public spaces are perceived to be unsafe. Participants indicated numerous hotspots, and the space in which these hotspots/significant events occurred generated public knowledge of a place that was particularly dangerous and unsafe.

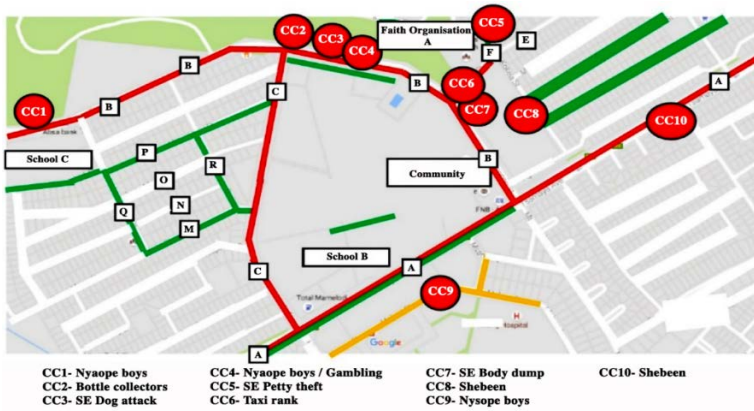

Figure 7. **PERCEPTIONS OF SAFETY: COMMUNITY REPRESENTATIVES, CHILDREN**

Children from the community perceived residential spaces to be safer (Routes O-Q) than spaces which were public or commercial (A, B and C) as can be seen in Figure 7. Hotspots occurred along intersections and public open spaces.

DISCUSSION

In this study, differential (age and gender) perceptions of safe spaces relating to the utilisation of space within an impoverished community setting were explored. Such perceptions feed into local knowledge production, which in turn has relevance for the socialisation and the discourse of the multi-dimensionality of safe spaces and community safety at various levels of engagement.

Perceptions of safety influence the use of a space and need to provide a certain level of both objective and perceived security (Brázdová *et al*., 2015). De Beer and Swanepoel (2013) emphasise the significance of understanding safety within a South African community development perspective where safety is a prerequisite for positive social engagement and transformation. The creation of safe spaces may aid in improving the use of a space through the provision and safeguarding of spaces, understanding the integrated dimensions and multi-functionality.

The spatial segmentation discussed by Parker (2006) is still relevant for the community of Mamelodi East. Spacial segmentation presents five distinct types of spaces: private (spaces with restricted access), public (spaces for public interaction), commercial (spaces for economic opportunities and activities), residential (spaces for living) and transport (spaces for mobility), each relating to a different facet of safety perception. Spaces that do not strictly fall within these distinct categories, such as functional categorisation, are associated with negative perceptions as demonstrated in the mapping of 'unsafe' spaces (Figures 1-7). The complex constructing of safe spaces intersecting with functional components mainly relate to the social, cultural, political and physical dimensions (De Beer & Swanepoel, 2013; Spaaij & Schulenkorf, 2014). The social learning and socialisation aspect lies within the psycho-social domain of information processing and local knowledge production. The symbolic value of what spaces stand for (functional and/or physical manifestation) increases a sense of familiarity (living or residential spaces) or are unpredictable (spaces for mobility or commercial activities).

For both adults and children, a **commercial space** is seen as a gathering of unfamiliar elements associated with traffic density, which in turn limits physical activity (D'Haese *et al*., 2015). These elements congest the space with unfamiliar people who are coming to buy and sell, thus it is interpreted as a space that is unsafe because of its relative unpredictability. Additionally, shebeens attract young males and the level of intoxication within these spaces adds to elements of unexpected behaviours, which also contributes towards feelings of unsafety (Bray *et al*., 2011). The element of fear in a commercial space is thus constructed and maintained through the inability to anticipate an outcome or actions of individuals. The individual, therefore, relies on memories to formulate an understanding and response to space (Valentine, 1989).

The results indicated that most children felt free and safe to walk home (travel/walking space) after sport unsupervised, as they often walk together in smaller groups and feel safe in the company of their friends (Figures 1-4). Such a finding is supported by Evenson *et al*. (2006), who found that children who had a higher individual mobility reported higher feelings of perceived safety due to an increased awareness of their surroundings. The sport coaches in this

study are teaching life skills and would educate participants about safety matters and caring for each other, which adds the social learning aspect to learned behaviour (Bandura, 1986).

The greatest tangible challenge encountered by children that inhibited them from walking through public spaces included cars parked on designated walkways. Once again, this confirms that when the designated use of a space does not match the functionality, space may become unsafe. When the designated use of a space does not align with the functionality of space through a lack of policy enforcement, the physical space is perceived to be one that is unsafe.

A greater sense of perceived control for both the individual and the community means that individuals have access to a larger number of people (**populated density of space**) who trust one another. There is safety in numbers with relatively small groups where members are familiar with one another (Elvik & Bjørnskau, 2017). Group safety also manifests itself through a greater shared sense of responsibility within the community as community members make themselves available to assist with community events such as soccer games or spiritual gatherings.

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Significant events also have bearing on socialised perceptions that are often transmitted from adults to children or through peer-to-peer interactions. A significant event (SE) disturbs the sense of safety or harmony within a space and may trigger psychosomatic responses to the space in which the SE occurred (Figure 8). In addition, the occurrence of a SE may alter the perceived safety of the space, through the embodiment of that SE within the space.

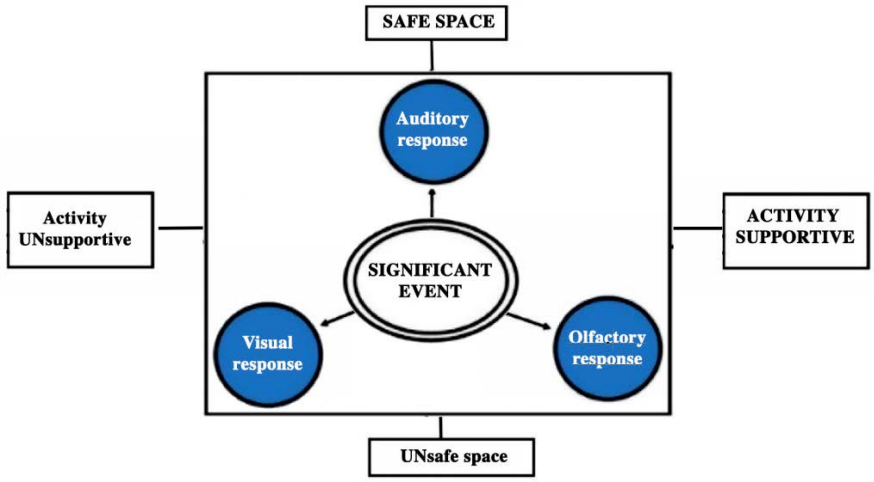

Figure 8. **SIGNIFICANT EVENTS TRIGGER PSYCHOSOMATIC RESPONSES**

Within the psycho-social dimension is embedded individual sensory learning of positive and negative associations that extends to perceptions of how spaces are experienced. In this sense, observable images, sounds and smell informs an individual of how to interpret safety issues associated with such sensory experiences. For instance, if a young girl sees an older male stranger that 'looks dangerous', the space emanating from the character may be viewed as dangerous, versus seeing a law enforcement male figure, in which case space may be interpreted as 'safe'. This is also true for viewing spaces as 'safe' and an invitation (supportive or unsupportive) towards participation in physical activities under the supervision of a coach, who is considered an adult to be trusted (Figure 8).

The fear cultivated from the occurrence of a SE personifies all spaces that are similar to the space in which the SE occurred. This compromises an individual's mobility, thus negatively affecting their levels of physical activity (Valentine, 1989; Evenson *et al*., 2006).

Figure 9 illustrates how safe spaces are created, as informed by the results of this study. In actual fact, reality is complex, therefore, multiple multi-levelled layers of influence triggered by a significant event can influence perceptions of safety. Through auditory, olfactory and visual cues, a person is able to make a subconscious judgement on whether a space is safe or unsafe, activity supportive or activity unsupportive. An individual's interpretation of those cues is informed by learned behaviours that develop over the course of an individual's life (Bandura, 1986). Thus, psychosomatic responses embody the space through episodic memories, which in turn relay positive memories or negative experiences of safety (Valentine, 1989).

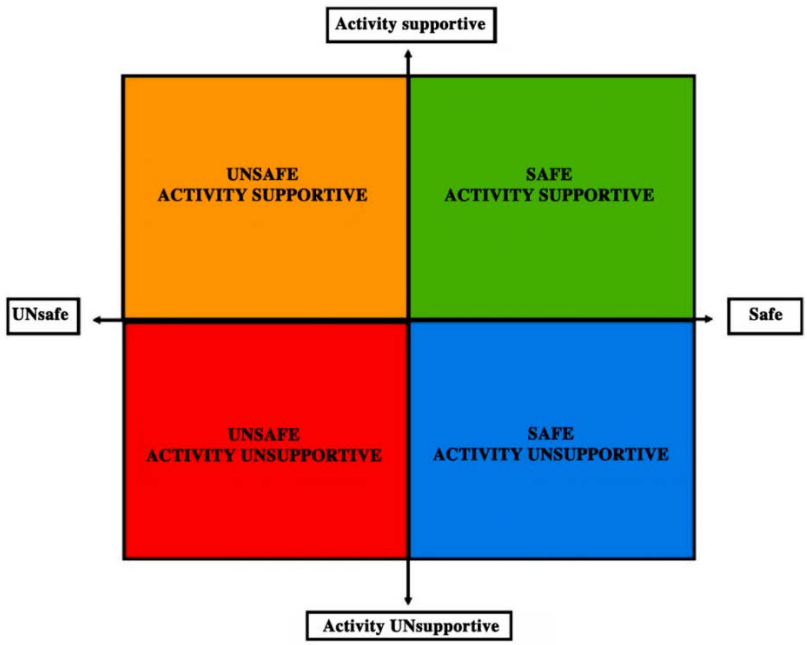

Figure 9. **THEORETICAL FRAMEWORK ILLUSTRATING TYPOLOGIES OF SPACE**

Policies may influence the physical and environmental dimension of safe spaces through spatial development (which informs the appropriate design) and allow for adequate maintenance within a space. Policies may find tangible expression in the provision of safe and well-maintained infrastructure, community beautification and safe walkable spaces.

CONCLUSION

The multi-dimensionality and indigenous understanding associated with experiences and socialisation influences, contribute to the social construction of safe and unsafe spaces within a local context. In impoverished communities, the interpretation of safe and unsafe spaces may differ between individuals or groups, but themes of collective understandings may find traction over time into public views and opinions. Shared ideas relating to the construction of spaces, understanding of safety, and is conducive to active living may be seen as normative behaviour within a particular cultural setting.

Therefore, the loop from policy to practice or impact of various interventions addressing 'community safety' requires constant re-evaluation and assessment of spaces. Community engagement and considering lived realities and sense-making are crucial for the construction of safe spaces and active living (Backe *et al*., 2012). The inclusion of informed policies may influence existing perceptions of a space as a multi-dimensional phenomenon through urban planning that directly addresses the existing needs of the community. Contextualising urban planning, therefore, becomes central to creating safe spaces.

In impoverished communities with a lack of financial resources in local municipalities, urban planning may not always be a viable option to address the safety needs of a community. Therefore, it may be useful to establish the extent to which a space is safe or unsafe, so that programmes and interventions can identify a starting point through implementing a mapping and scorecard approach by meaningfully addressing the safety issues in a particular context. Space, as a phenomenon, can be seen to manifest itself on a spectrum from safe to unsafe, and activity supportive to activity unsupportive. Thus four typologies in which a space can exist have emerged, namely safe, unsafe, activity supportive, activity unsupportive (Figure 5). These typologies exist within a high socio-economic context, as well as a low socio-economic context.

The use of such a typology allows for the cross-setting comparison of communities who fit within a certain typology, rather than individual components. The visual mapping of community spaces according to safety dimensions could aid the facilitation of appropriate physical activity development approaches (Parker, 2006) and inform or direct stakeholder collaboration for addressing the creation of safe participation in physical activities within community spaces.

All community-based stakeholders may collaborate and play a vital role in implementing safety measures and strategies in providing surveillance for safe corridors within the public space to enhance active living. In turn, schools and NGOs offering sports and physical activity programmes would benefit from community mapping so as to identify safe (green) spaces for the mobility of their participants that will influence the numbers of active participants.

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