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EMPIRICAL REVIEW

"That was the Last Time I Saw my House": The Importance of Place Attachment among Children and Youth in Disaster Contexts

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Abstract Place attachment is important for children and youth's disaster preparedness, experiences, recovery, and resilience, but most of the literature on place and disasters has focused on adults. Drawing on the community disaster risk reduction, recovery, and resilience literature as well as the literature on normative place attachment, children and youth's place-relevant disaster experiences are examined. Prior to a disaster, place attachments are postulated to enhance children and youth's disaster preparedness contributions and reinforce their pre-disaster resilience. During a disaster, damage of, and displacement from, places of importance can create significant emotional distress among children and youth. Following a disaster, pre-existing as well as new place ties can aid in their recovery and bolster their resilience moving forward. This framework enriches current theories of disaster recovery, resilience, and place attachment, and sets an agenda for future research.

Keywords Place attachment · Children · Youth · Community resilience · Disasters · Disaster risk reduction

Introduction

Place attachment, the affective–cognitive bond that forms between people and their important places (Low & Altman, 1992; Scannell & Gifford, 2010a) is central to the human experience; as Edward Relph (1976) explained, "to be human is to live in a world that is filled with significant places: to be human is to have and to know your place" (p. 1, 1976). Place attachment is also central to the human experience of *disasters* (Cutter et al., 2008), and this may be especially true for children and youth, who rely on place for key aspects of their biopsychosocial development (e.g., Chatterjee, 2005; Korpela, Kytta & Hartig, 2002; Morgan, 2010). Indeed, place attachment themes are often evident in young people's disaster stories, such as in their descriptions of damage or displacement; one youth's personal account of the 2013 floods in Southern Alberta, Canada poignantly concluded with, "That was the last time I saw my house" (Mantilla Productions, 2013). Despite the prevalence of place attachment-relevant themes in qualitative and quantitative social science disaster data, researchers rarely explicitly connect these themes to existing theoretical frameworks of place attachment, and this is even less common in disaster research on children and youth.

A growing body of work has begun to demonstrate that children (under the age of 18; United Nations, 1989) and youth (between the ages of 15–24; United Nations, 1985) are not only vulnerable to disasters but that they also have great capacity to contribute to their own recovery, and that of their families and communities (e.g., Fothergill & Peek, 2015; Peek, 2008). However, within the emerging literature on young people's vulnerability and resilience in the context of disasters, few studies explicitly examine or explain the role of important places. We argue that place attachment is important to children and youth's disaster preparedness, experience, recovery, and resilience, and that by identifying place attachment processes, we will better understand, as well as support child- and youth-relevant disaster risk reduction, recovery, and resilience.

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At the same time, this investigation will inform theories of, and generate an agenda for research on, place-based disruption and well-being among children and youth. We begin with an overview of normative place attachment in children and youth, and then consider which of these processes are applicable prior to, during, and after disaster.

Place Attachment

Place attachment has been observed in individuals of different cultures, genders, socioeconomic backgrounds, and ages (e.g., Lewicka, 2011). Scannell and Gifford's (2010a) person-place-process framework highlights the diversity of place attachments that can emerge given various individual and cultural constructions of place meaning, the range of social and physical features of the place to which one can be attached, the varying spatial levels at which attachment can occur, and the affective, cognitive, and behavioral psychological processes through which the attachment is expressed. Despite the diversity of possible place attachments, many have implications for disaster experiences across the disaster and recovery life cycle.

Much research on place attachment focuses on the dyadic level of analysis, describing the emotional connections between a person and a meaningful place (e.g., Lewicka, 2011; Vaske & Kobrin, 2001). Like other psychological constructs, place attachment also likely develops and operates within a complex set of interrelated systems, or contexts, that surround the individual, such as immediate groups and places, and broader political, economic, and cultural systems (e.g., Bronfenbrenner, 1977), but few studies have explicitly examined place attachment across these various socioecological systems (e.g., Beckley, 2003). Although place attachment is influenced by context, it should not be *conflated* with context; rather, it emphasizes the emotional bond between an individual and a particular socio-physical environment. This paper therefore primarily focuses on individually based place attachment, but we also acknowledge and discuss contexts that may influence the attachment-related disaster experience, and associated recovery and resilience processes.

Normative Place Attachment in Children and Youth

The psychological impacts of disrupted attachment relationships are better understood with knowledge about how the relationships functioned before the disruption occurred; interpersonal attachment researchers like Bowlby (1969) and others (e.g., Sbarra & Hazan, 2008) therefore established the processes of normative attachment before explaining the dysregulation that accompanies person–person loss. Similarly, in the place domain, understanding children and youth's responses to losing important places from disasters, as well as using old and new places to support disaster resilience, requires knowledge about how their place attachment normally functions. Much has been written about the nature and importance of place ties to children and youth's physical and psychological well-being. These theories can provide insight into why place is relevant for young people at all stages of the disaster cycle, and how it is distinct from the place-based disaster experiences of adults.

In Children

Childhood place attachment has been characterized as close to home, unselfconscious, taken-for-granted, and focused on affordances (Hay, 1998; Moore, 1986). Early childhood place attachment is thought to develop when a child's bonds with his or her caregiver become associated with, and generalized to, nearby physical environments such as their home, neighborhood, or community (Hay, 1998; Fried, 2000; Morgan, 2010). This widening of attachment bonds from the caregiver to the environment may also co-occur with children's increasing exploratory range as they become more mobile and self-sufficient (Hay, 1998).

Place attachment not only develops on interaction with interpersonal attachment, but the two are mutually reinforcing (Morgan, 2010). Once caregivers provide a secure base away from potential threats, a child's exploratory system is activated, leading them to examine nearby environments that entice with fascinating stimuli. Interaction with the environment supports a child's development through mastery of skills, adventure, freedom, and sensory pleasure, creating positive affective ties to the place. Dangerous external stimuli, or distressing internal states (i.e., pain, fear, fatigue) prompt a child to return to the safe haven of the caregiver. Over time, these interactions contribute to a child's structured knowledge (or "mental models") about what to expect from a given place, and places in general, such as their degree of safety and ability to soothe (Morgan, 2010).

Other theories similarly portray the development of place attachment in childhood as a need satisfaction process (although not necessarily within the context of existing interpersonal attachment bonds), whereby place bonds are formed and reinforced by repeated matches between a child's needs and the environment's affordances (Chatterjee, 2005; Chawla, 1992). Specifically, favorite places have been shown to support a number of needs and activities central to children's development: emotion regulation, restoration of attention, and problem-solving, by providing a safe space with psychologically restorative properties (Korpela & Hartig, 1996; Korpela et al., 2002);

autonomy, by providing an opportunity to create and control a space that is embedded in, yet somewhat separate from, adult-regulated spaces (Chatterjee, 2005); and competence, by providing physical and social properties that can be observed, explored, manipulated, and learned (Chatterjee, 2005; Dovey, 1990; Morgan, 2010; Porteous, 1990). Places also support early identity development, where children come to know which spaces are theirs (e.g., their bedroom, secret fort, or desk at school), and begin to assimilate the qualities of these places into their self-concepts (Cooper Marcus, 1992).

Because individuals bond with places that serve needs relevant to their stage of development, the typologies of place attachment in children, adolescents, and adults tend to differ. Common places of childhood attachment include outdoor places in nature, built structures (e.g., a porch or shed) re-purposed by children for their own uses, their bedrooms and homes, community service and retail settings (e.g., libraries), and places built intentionally for play (e.g., tree house, sport settings, playgrounds, and parks) (Chawla, 1992; Clark & Moss, 2001; Cooper Marcus, 1992; Kirkby, 1989; Korpela et al., 2002; Maller et al., 2009). The types and uses of place differ across the child's age and stage of development. For example, in one study of over 400 Swedish adults recalling childhood places of play, sandboxes were the most commonly recalled places of play between the ages of 3–6 years, allowing manipulation of the space, make-believe play, and playing with other children (Sandberg, 2003). At ages 7–12, however, natural spaces were more commonly recalled—especially secret places like forests or trees, where children could build forts, climb, and play with friends away from adult supervision. Culture also influences children's interaction with places, including the type of play and the meanings ascribed to the place (Hay, 1998; Spyce, 2009). Congruent with socioecological theorizing (e.g., Bronfenbrenner, 1977), Derr (2002) conceptualized children's sense of place in northern New Mexico as including nested ecological units. The child-scale relates to the child's attachment and direct experience with the environment, through activities such as climbing trees, playing games, or making forts. The family scale situates these experiences in a historical and cultural context. The community-level scale refers to the broader cultural and political values within which these interactions occur. In addition to cultural influences, types of childhood place attachments are limited by a child's range, potential hazards in the nearby environment, and adult-generated restrictions or impositions such as urban development, that appropriate or reduce access to child-friendly spaces (Jack, 2010; Spencer & Woolley, 2000). Although the age at which place attachment first develops in childhood has not yet been established, a number of studies point to middle childhood (e.g., ages 7–12) as a time when place bonds are particularly strong (e.g., Chawla, 1992; Morgan, 2010; Sandberg, 2003).

In Youth

In adolescence and early adulthood, although home, bedrooms, and natural areas are still common types of favorite places (e.g., Abbot-Chapman & Robertson, 2009), other places of attachment are located within a broader range than those of childhood (Hay, 1998), or middle and late adulthood. For example, youth aged 17–30 years tend to show relatively stronger attachment to the city than the home or neighborhood, but at older ages, the home and neighborhood become more important (Hidalgo & Hernández, 2001). Another difference in adolescence is that place-derived identity becomes stronger than it was in childhood (Cooper Marcus, 1992; Hay, 1998). For example, youth communicate identity by personalizing their existing spaces (e.g., bedrooms), and gain independence by seeking out spaces away from family members (Cooper Marcus, 1992). Commercial and cultural spaces, such as movie theatres, youth-friendly dance clubs, churches, and youth centers are new types of favorite places that emerge in adolescence but not childhood, reflecting the increased emphasis on place attachments that are socially and culturally relevant (Sandberg, 2003; Spyce, 2009). This is also the time for building coherent personal stories, embedded in place, that contribute to self-continuity; that is, particular places become the settings of personal narratives about past events and ongoing traditions (Cooper Marcus, 1992). Through place, youth also develop and maintain autonomy and self-esteem, which both have implications for their overall sense of well-being and quality-of-life (Korpela, 1992; Pretty, Conroy, Dugay, Fowler & Williams, 1996).

Compared to young children, youth are especially likely to attach to places that provide suitable opportunities for socialization, education, and employment (Eacott & Sonn, 2006; Elder, King & Conger, 1996; Pretty, Chipuer & Bramston, 2003). Given this, as well as migration decisions that for many youth arise after high school, it is not surprising that attachment to a particular place can be less stable among youth than children or adults. A two-phase longitudinal study showed declining place attachment in 8th and 11th graders with higher academic achievement, fewer social ties, and fewer opportunities for local employment (Elder et al., 1996). The possibility of migration can also shift the taken-for-granted experience of childhood place attachment into one of greater awareness, or homesickness for some youth who have moved away (Eacott & Sonn, 2006; Hay, 1998; McAndrew, 1998). Cultural influences also play a role in youth's

experiences of place attachment. In a study comparing place attachment strength among adolescents in 13 countries, youth from Scandinavian countries showed stronger levels of place attachment than those in Eastern European and Baltic countries (Dallago et al., 2009); however, relatively few studies have explored the role of culture, politics, economics, and other macro-system influences on youth's place attachment. Knowing how place attachment develops, the developmental needs it satisfies, and the types of places important to children and youth, provides a lens of interpretation for understanding children and youth's disaster preparedness, experience, recovery, and resilience.

Disasters

Disasters are commonly distinguished as either natural (e.g., earthquakes, volcanos, floods) or human-caused/technological (e.g., explosions, oil spills, armed conflict), but most scholars recognize that hazards only become disasters when they disrupt in interaction with social conditions (e.g., Brun, 2009; Perry, 2007), and when the accumulation of losses exceeds "the capacity of the affected society to cope with its own resources" (p. 23, Ginige, Amaratunga & Haigh, 2009). Disaster planning and management (or lack thereof), and individual, family, and community decisions and characteristics determine whether a hazard disrupts to the point of disaster. Marginalized groups, including children and youth, are vulnerable when they have limited access to resources compared to those in power (Gallard, 2011). As was evident in the case of Hurricane Katrina, existing social (e.g., class, age, gender, ethnicity, disability), economic (e.g., access to resources; social services); and environmental conditions (e.g., location, and structure of buildings) create vulnerabilities that, in concert with a hazard, result in disaster (Browne, 2015; Cannon, 1994). In this way, even "natural" disasters can be considered social phenomena.

Furthermore, most disasters are intimately related to physical environments, whether the hazard stems from, or causes damage to, important places. This review examines place attachment as it relates to natural and technological disasters, as well as considers differences in onset (slow vs acute). However, despite some parallels in events and processes, disasters related to war and armed conflict were not the focus of the present review, given that it can evoke different psychological responses, that laypersons tend to perceive war as attributable to human intent and political agendas (Yassi, Kjellstroem, de Kok & Guidotti, 2001), and that it can involve other confounding factors affecting children and youth such as the use of child soldiers. Therefore, the present review begins the inquiry into disaster resilience, place, and young people by focusing on natural and technological disasters, while acknowledging that the role of place attachment in the context of war and armed conflict is a worthy, but separate area for future inquiry.

Place Attachment and Pre-Disaster Resilience

Broadly defined, resilience is both an individual capacity to identify and access resources (e.g., psychological, social, cultural, and physical), and the individual and collective ability to ensure the equitable and culturally relevant provision and access to these resources (Archibald & Munn-Venn, 2008; Popa, Guillermin & Dedeurwaerdere, 2014). This definition supports a more relational understanding of well-being embedded in a social-ecological framework (Bronfenbrenner, 1979), and recognizes the relative strengths and vulnerabilities of overlapping physical (i.e., natural and built), social, and economic environments (e.g., Cutter et al., 2008; Ungar, 2011). Place attachment has been recognized as a key contributor to disaster resilience, exerting different influences on pre- and post-disaster environments (Berkes & Ross, 2013; Cutter et al., 2008; Mishra, Mazumdar & Suar, 2010); however, limited research has explored how place attachment relates to disaster resilience among children and youth. Knowledge of place-based resilience as it relates to adults, therefore, serves as a starting point of inquiry before examining whether and how such processes manifest at younger developmental stages.

In Adults

In the community disaster resilience literature, which largely focuses on adults, residents' ties to place that have been established prior to a disaster have been shown to prevent or minimize losses, because person–place bonds can motivate and afford disaster awareness, planning, information sharing, purchasing insurance, and other mitigation, preparedness, stewardship, or activism behaviors (e.g., Anton & Lawrence, 2016; Cutter et al., 2008; Zhang, Zhang, Zhang & Cheng, 2014). While preparedness refers to the a priori steps taken to minimize harm and aid in recovery should a disaster occur (e.g., Dooley, Catalano, Mishra & Serxner, 1992), stewardship includes maintenance and upkeep of a place, including hazard removal, and other place-protective activities (e.g., Gifford & Nilsson, 2014), and activism involves collective action to make or prevent changes in the socio-physical environment (e.g., Stern, 2000).

The positive association between place attachment and pre-disaster preparedness has been shown in different

cultural contexts for a number of types of disasters. Specifically, this has been shown for rapid onset disasters such as wildfires, floods, and volcanic eruptions (Bihari & Ryan, 2012; Bird, Gísladóttir & Dominey-Howes, 2011; Mishra et al., 2010). For example, in six communities across the United States, place attachment was associated with greater wildfire awareness and support for preparedness (Bihari & Ryan, 2012).

For slower-onset disasters, encroaching damage can heighten individuals' awareness of the importance of place, and thus concern about the hazard. In one study, rural Australian residents with more place attachment showed greater concern about drought conditions (e.g., Stain et al., 2011). Heightened concern was similarly expressed among Louisiana residents facing increasing coastal wetland loss, which in turn, guided restoration efforts and policies (Burley, Jenkins, Laska & Davis, 2007). Place attachment can thus create a strong base, rooting people and place together, enabling them to prepare for, and better withstand, the blows of disaster.

Some types of place attachment bonds proving more relevant to disaster preparedness than others. Mishra et al. (2010) demonstrated that residents in rural India with stronger family-based or ownership-based place attachments were generally more prepared for floods than are those with stronger spiritually based place attachment. Others have found that socially based place attachment, including community ties, propagates the social capital needed to effect a culture of place stewardship (Scannell & Gifford, 2010b), neighbourliness (Woldoff, 2002), and community participation and planning (Manzo & Perkins, 2006) that build a community's strength and poise it to face a disaster.

In addition to preparedness and stewardship, place attachment can also underlie activism. For potential technological disasters, this can include opposition to new developments. Western Canadian residents who attended public hearings to oppose a proposed oil pipeline referred to their lived experiences and deep connections to the physical landscape, and expressed concerns with oil spills as central to their opposition (Barton & Corbett, 2014).

Interestingly, however, place attachment can sometimes inhibit pre-disaster resilience, such as when the adaptive changes that are required to bolster community resilience threaten existing place meanings or place identity (e.g., De Dominicis, Fornara, Cancellieri, Twigger-Ross & Bonaiuto, 2015). For example, although wind farms build resilience in the face of climate change (i.e., by shifting away from fossil fuel dependence), residents with stronger place attachment more often oppose wind farm development, given fears that such farms could disrupt existing place meanings and place identity processes (Devine-Wright, 2009; Devine-Wright & Howes, 2010). In another study, Australian peanut farmers with stronger place attachment were less interested in learning about climate change and its impacts on the peanut industry, or taking measures to adapt to those possible changes than were those who were less strongly attached (Marshall et al., 2014), likely because acknowledging such changes would threaten their sense of place dependence.

Place attachment may also undermine resilience when places appear to provide a false sense of security from disasters. Residents from Bucharest, Romania, who were more attached to their residences were less likely to perceive that their house would be damaged in the event of an earthquake (e.g., Armas, 2006). More severe, is when residents with strong place attachment refuse to evacuate, sometimes putting their lives in danger in order to stay close to home (e.g., Boon, 2014; Chamlee-Wright & Storr, 2009; Fried, 2000; Paton, Burgelt & Prior, 2008;). Existing studies do not often distinguish the relative contribution of place attachment to evacuation failure, although some have identified transportation, access to shelter, pet ownership, and mistrust in media or government as important barriers (e.g., Elder et al., 2007; Heath, Kass, Beck & Glickman, 2001), so it is unclear when and how much place attachment weighs into evacuation outcomes. However, some studies have begun to support the notion that place attachment is a key influence in evacuation, that may interact with other barriers. A study of volcano risk in Indonesia demonstrated that culture shaped the connection between place attachment and evacuation behavior (Donovan, Suryanto & Utami, 2012); those with intense connections to the Mt. Merapi volcano and region expressed that they would be less willing to evacuate, relying on beliefs that hazards would not come to their area, that ceremonies and other spiritual forces would protect them, and that government officials could not be trusted. In sum, place attachment can both contribute to, and undermine pre-disaster resilience, in culturally relevant ways, which raises the question of whether and how such processes are expressed in children and youth.

In Children and Youth

Very little has been written about the role of place in children and youth's pre-disaster resilience. However, theories of normative child and youth place attachment, as well as emerging work on place-based pre-disaster resilience in adults, suggest several possible routes of influence. As discussed, place attachment supports key developmental tasks and generally exerts salutary effects on children and youth's mental and physical health. Thus, one hypothesis is that pre-existing positive relationships with place should buffer the negative impacts of disasters among young people. Research has established that children's pre-disaster

functioning predicts their degree of post-disaster distress (Peek, 2008). For example, Puerto Rican children who were living in poverty were more likely to exhibit symptoms of post-traumatic stress disorder 18 months following a hurricane (Felix et al., 2011). Similarly, higher levels of distress were observed among Californian children who experienced poorer pre-disaster relationship functioning with parents prior to an earthquake (Proctor et al., 2007). Relationships to place are likely another indicator of pre-disaster resilience. Because place attachment can positively support children and youths' emotional and social functioning and increase their quality of life (Pretty et al., 1996), those with strong bonds to place should be better able to withstand the effects of disasters.

A parallel possibility is that, as in adults, place attachment may motivate and support children and youth's disaster preparedness, stewardship, and activism contributions. Although young people do not typically engage in all of the same types of preparedness activities as adults (e.g., purchasing insurance, home improvements, etc.), they can play an important role in communicating disaster risks and preparedness options to their families (e.g., Ronan et al., 2008). In addition, young people are motivated to protect their places of attachment (Rioux, 2011; Vaske & Kobrin, 2001). Given this, children and youth with stronger ties to place may be more likely to effectively communicate learned disaster risks, preparedness options, and other information to their families and communities, especially when risks to place are highlighted in disaster preparedness campaigns. Furthermore, because certain types of place attachment are more predictive of disaster preparedness (e.g., Mishra et al., 2010), and young people typically attach to different types of places than do adults, further research should examine the effectiveness of disaster education campaigns that are contextualized in child- and-youth-relevant places.

Other than enhancing communication efforts, place attachment may also directly influence the ability of young people to detect and address local hazards. Young people tend to frequently visit and use their favorite places (Korpela et al., 2002), develop detailed cognitive maps and place knowledge (Spencer & Woolley, 2000), and take heed of changes and threats to their places (Carlino, Somma & Mayberry, 2008; Raymond & Brown, 2011). In one case, a group of children in El Salvador noticed unregulated excavation of sand and rocks, identified this activity as a major risk to flooding of nearby homes, and successfully arranged a campaign to stop it (Mitchell, Haynes, Hall, Choong & Oven, 2008). Although the influence of place attachment was not examined, this sequence of actions is congruent with theories of place attachment-mediated activism, in which individuals detect and take action against threats in order to protect their places (Vorkinn & Riese, 2001; Zhang et al., 2014). Future research on children and youth's hazard mitigation and place-based activism should confirm the relative contribution of place attachment in motivating such action.

Investigations of disaster risk reduction in children and youth that are grounded in theories of place attachment will offer a deeper understanding of the mechanisms and motivations as well as barriers underlying such actions. In addition, this knowledge may help to inform and enhance formal disaster preparedness activities for young people, such as risk mapping and evacuation planning (Peek, 2008). This leads to a number of avenues for future empirical study, such as comparing hazard mapping and evacuation simulations among children and youth with low and high levels of residential and neighborhood attachments. Children and youth's existing connections to place may thus be an untapped tool for improving disaster preparedness education campaigns as well as activating their successful disaster response. However, whether place attachment might also limit children and youth's disaster preparedness (as is sometimes the case in adults) is another research avenue that should be explored.

Disaster-Disrupted Place Attachment

In Adults

Of the many consequences of a disaster, the loss of place is one of the most devastating (e.g., Diaz, 2013; Fried, 2000), and can cause disorientation (Cox & Perry, 2011), alienation, and bereavement (Fullilove, 1996). Fried's (1963) classic study of immigrant-residents displaced from their neighborhood due to development was the first to demonstrate that the loss of meaningful places can produce grief responses not unlike those which occur when losing a loved one. More recent studies have similarly documented adults' feelings of bereavement and emotional distress from severed person–place bonds (Brown & Perkins, 1992; Fullilove, 1996; Greene, Tehranifar, Hernandez-Cordero & Fullilove, 2011), including those disrupted by natural (Cox & Holmes, 2000; Cox & Perry, 2011; Silver & Grek-Martin, 2015) and non-natural disasters. For example, following the 2010 Deepwater oil spill, Louisiana residents with stronger community attachment reported higher levels of negative affect (Lee & Blanchard, 2012).

The effects of place loss are powerful in part, because place underlies many types of losses, including social ties, property and possessions, cultural practices and culturally significant places, orienting landmarks that support wayfinding, and the social-spatial routines that make-up

the fabric of day-to-day life (e.g., Cooper Marcus, 1992; Greene et al., 2011; Windsor & McVey, 2005). These place-based losses are thought to be *disorienting* because of the loss of both physical and symbolic markers of individual and collective (e.g., neighbourhood, city, and culture) identity (Cox & Perry, 2011; Oliver-Smith, 1996). For example, a destructive forest fire that swept through the communities of Barriere and Louis Creek, British Columbia, Canada destroyed many homes, businesses and charred the forested landscape. Residents reported feeling confused and disoriented by a landscape without familiar landmarks, and because of the loss of their sense of home. Disaster-associated losses, real and symbolic, also disrupt in the short and long-term, the support and other community networks that contribute to social capital, a key element of community resilience (Cox & Perry, 2011). Similarly, after an F3 tornado destroyed parts of Goderich, Ontario in 2011, disorientation was felt even among residents who had not personally incurred damage to their homes; the radical changes to the town's landscape compromised their esthetically based place identity and interfered with their sense of familiarity and spatial routines (Silver & Grek-Martin, 2015). Along with validating Cox and Perry's assertion that place is central to the disaster experience, Silver and Grek-Martin observed that the disruption to place is not limited to the initial disturbance caused by the disaster, but that it re-occurs over time with the changes and disturbances that result from ongoing demolition and reconstruction.

In Children and Youth

Research interest on the displacement of children and youth was minimal until after 2005, when over 370,000 children and youth were displaced from Hurricane Katrina (e.g., Peek, 2008). Since then, research has revealed that, as in adults, place disruption and loss can disorient and diminish well-being in children and youth (e.g., Fothergill & Peek, 2006; Michaud, 2014; Spyce, 2009), but surprisingly, theories of place attachment are often missing from the interpretation of such findings.

Children and youth attach to different types of places than adults, and use these places for specific developmental tasks and satisfaction of particular psychological needs. Lost or damaged homes, schools, natural and built recreation areas, and other community places, along with the loss of people, pets, and things embedded in place, can cause particularly negative impacts for children and youth. Case studies and individual interviews underline this point. For example, Fothergill and Peek (2006) recount the experience of a child living in a shelter following Hurricane Katrina, who expressed an intense longing for home; as his mother noted: "With my son, and him bein' four, it's hard to explain to him, or get him to understand, that you're not going to be where you were before. [. . .] And he's sayin' the same thing: 'When am I goin' back to my school? When am I goin' back home?' Or, 'I'm ready to go back home. Call my sister. Call my brother. Where's my aunt?' "(p. 111). In the same report, the authors describe another disaster-displaced child who threatened to hit a mental health counselor, stating, "If I was in jail I'd never have to worry about where I'm sleeping" (p. 109, Fothergill & Peek, 2006). While place attachment certainly appears relevant to these cases, additional in-depth research is needed to explore the mechanisms through which disrupted place attachment links to negative disaster experiences, and its degree of influence relative to other variables.

Others have demonstrated that like in adults, disorientation can occur among youth following disaster-related place loss (Michaud, 2014). In one study, youth who had experienced destructive forest fires in the northern Alberta town of Slave Lake described disorientation experiences of getting lost in their own neighborhoods (Michaud, 2014). Place attachment disruption can also occur when environmental changes are more gradual. An in-depth exploration of place attachment in Aboriginal Canadian youth living in a resource extraction-intensive community revealed that gradual changes to the physical environment disrupted youth's social relationships and cultural practices (Spyce, 2009). Youth were concerned about oil and gas development, the loss of habitat and wild animals, the impacts of forestry, and the effects of climate change. They viewed these changes as eroding their place attachments, which in turn led to a fading culture, with fewer traditional food-gathering and recreational activities, a loss of traditional knowledge, and a loss of social and cultural activities. Clearly, place ties are important for disaster-affected children and youth, but aside from a few studies, such evidence tends to remain detached from theory.

Other studies have quantitatively documented the decrements to young people's physical and mental health following displacement from Katrina and other disasters. Increases or exacerbations in children and youth's stress-related illnesses such as asthma have been observed, the seriousness of which is compounded by the absence or fragmentation of medical care (Abramson & Garfield, 2006). Disaster-displaced children are also at risk for behavioral problems such as aggression or, among displaced adolescents, delinquency and drug use (Fothergill & Peek, 2006; Norris et al., 2002; Reich & Wadsworth, 2008). In one study, Katrina-affected youth who had been evacuated to Dallas-Fort Worth engaged in a greater number of risky behaviors and fewer protective behaviors

(such as sports) than did the youth who had not been relocated (Barrett, Ausbrooks & Martinez-Cosio, 2008). Difficulties in learning and academic achievement are also more common among youth who have been displaced from a disaster (Reich & Wadsworth, 2008). Again, isolating the relative influence of place attachment on such outcomes is needed.

Although much research indicates that disaster-affected children and youth are at increased risk for psychological difficulties, such as PTSD, the importance of place disruption in these negative outcomes is generally not made explicit by researchers. For example, Californian children and youth whose homes were destroyed by a wildfire showed significantly higher levels of stress than did those who did not lose their homes (Felix et al., 2015), but these experiences were not examined with place attachment in mind. Wickrama and Kaspar (2007) demonstrated that Sri Lankan youth who experienced prolonged displacement from the 2004 tsunami were more likely to report PTSD and depressive symptoms. Although it was not considered in their study, assessing place attachment could reveal the degree to which the psychological distress is linked to the disrupted place bond compared to other aspects of the displacement. In another study, PTSD symptoms in children 3 months post Hurricane Andrew were strongly correlated with the number of loss-disruption events they had experienced (Vernberg, La Greca, Silverman & Prinstein, 1996). These included the place attachment-relevant variables of losing one's home, moving to a new town, or school, and losing possessions, but they also included other non-place items, so the *relative* contribution of these place attachment variables remains hidden. Similarly, among school age children who experienced Hurricane Hugo, PTSD was more likely if their homes had been damaged, they had been displaced, or one or more parent became unemployed (Lonigan, Shannon, Taylor, Finch & Sallee, 1994). Although two of these three significant predictors apply to place attachment processes, the study lacks a place-based theoretical framework. In another study, data from over 7200 Katrina-affected children and youth (ages 7–19) revealed key predictors of qualifying for a mental health referral (Osofsky, Osofsky, Kronenberg, Brennan & Hansel, 2009). Of those, several specifically related to place, including being displaced, living in a trailer, and being evacuated to a shelter rather than a hotel. Osofsky et al. do acknowledge the important role of place attachment in children and youth's psychological response to disasters, but they do not use the theory to explain the mechanisms underlying their results. Recognizing and situating child and youth disaster research in existing place-based theories is important to more fully understand their experiences in disasters, explain the potential mechanisms of the negative effects of place loss, and more effectively guide psychosocial and community-based interventions.

Post-Disaster Place-Based Recovery and Resilience

Place attachment is not only a source of pre-disaster resilience as well as a target of destruction during disasters, but it is also a source of *post*-disaster resilience that can support the recovery of individuals, families, and communities. A number of place-based routes to disaster recovery and resilience have been identified, some of which are specific to children and youth.

Developmental Support

In one place-based process, children and youth's disaster recovery may be enhanced by the existence of suitable places that allow them to return from the disruption, and re-engage in the tasks of development. When asked which places were important to their recovery and why, youth from four disaster-affected (i.e., a fire, tornado, and floods) communities in Canada and the United States described places such as their own bedrooms, youth centers, schools, recreation centers, plazas, skate parks, theatres, libraries, and other community spaces, citing the ability to be themselves in these places, pursue goals there, socialize with friends, and engage in hobbies and activities (citation omitted for blind review). Youth who did not have access to such places longed for them, and expressed greater difficulties with their recovery in general.

Place Attachment Leverages Social Capital

Another place-based resilience process occurs at the community level when strong pre-existing place ties help to preserve and re-establish the community after a disaster even when the physical place is lost or altered; specifically, place ties can leverage social support, the sharing of resources, and other advantages of social capital that benefit individual and community recovery processes (Cox & Perry, 2011; Renschler et al., 2010). Following the 2008 Sichuan earthquake in China, adult survivors with a stronger sense of community reported fewer depressive symptoms (Li, Sun, He & Chan, 2011). In support of this, Norris, Stevens, Pfefferbaum, Wyche and Pfefferbaum (2008) described community disaster resilience as "a network of adaptive capacities" (p. 127) whose strength is largely based in social capital, which is reinforced through sense of belonging, place attachment, and civic participation. By increasing the odds that communities will be able

to mobilize resources, services, and emotional supports, place attachment's impact on social capital contributes to the recovery of children and youth. Family, teachers, peers, and other community members help children and youth navigate and cope with post-disaster challenges, re-establish normalcy, and obtain needed supports and resources (Barrett et al., 2008; Peek, Sutton & Gump, 2008; Shen & Sink, 2002), and these relationships are often embedded in local networks such as neighborhoods and schools (e.g., Lenzi et al., 2012). Beyond being passive recipients of adult-generated social capital, children and youth also contribute to this capital, by supporting family and peers, and volunteering in community recovery efforts (Peek, 2008).

A related process is that *social* ties may affect the recovery of young people's *place* ties. Because place attachment in children can develop through parental attachment figures, who provide a secure base that allows them to safely explore and develop connections to their local environments (Morgan, 2010), secure interpersonal attachments should contribute to the formation of new or recovered place attachments following disasters. Secure bases established by attachment figures may promote the formation and repair of place ties. Thus, following a disaster, community place attachment improves children and youth's access to social capital, and in turn, social bonds may assist young people with the repair or formation of new place bonds.

Rebuilding

Place ties established prior to the disaster also contribute to community resilience by guiding the repair of the damaged physical environment after the disaster; place attachment and place identity can be "reorienting," delineating what and how to rebuild (Cox & Perry, 2011), and can motivate community involvement in rebuilding efforts (Silver & Grek-Martin, 2015). Such local involvement is important to allow residents to rebuild in a way that is sensitive to local cultures and customs, empower them as self-sufficient, and create formal and informal networks that increase a community's resilience in the long-term (Cox, 2007). In several cases, adult residents have come together to override post-disaster zoning maps that neglected to restore their meaningful areas (Francaviglia, 1978; Geipel, 1982).

Other community restoration efforts have focused on re-greening the environment, through gardening and planting trees (Cox & Perry, 2011). In one community, a non-profit organization was established to plant trees and restore residents' esthetically based place identity of living in "Canada's prettiest town" (Silver & Grek-Martin, 2015). Furthermore, community members whose safe havens suddenly became sites of danger in the face of a disaster can reclaim these places through building, re-purposing, and imbuing them with new meanings.

However, this can also interfere with resilience when the need for cultural continuity supersedes hazard mitigation. Following the 1970 Earthquake in Yungay, Peru, residents elected not to rebuild their city in a safer location and focused instead on recreating key community features, such as a plaza in the centre of town (Oliver-Smith, 1986). Therefore, place attachment can be a reorienting and healing force that leads to the physical and psychological repair of the community, but it can also interfere with creating a resilient community moving forward; however, most of the research along these lines excludes children and youth.

Despite the lack of research focus on children and youth, place attachment-guided rebuilding should be relevant to them, given that disasters can damage places where they live, play, and learn, and that rebuilding is one way they can contribute to their disaster-affected communities (Bartlett, 2008). For example, following the El Salvador Earthquake, children contributed to rebuilding houses and schools, cleaning up, and planting trees and gardens (Raftree, Machingaidze, del Valle & Foster, 2002). In a participatory action research project, children (ages 7–15) who experienced the 2008 Earthquake in Beichuan, China, transformed damaged places into sites of community cohesion (Zeng & Silverstein, 2011). In another study, youth from four communities in Canada and the United States who experienced different types of disasters (e.g., wildfire, tornado, and floods) similarly described having contributed to clean up and rebuilding efforts, although the extent of their involvement, and their decision-making and input into this work was often limited (citation omitted for blind review). Some experts recommend that children and youth be included as formal partners in post-disaster rebuilding and planning, to ensure that their perspectives and needs are represented (Rush, Houser & Partridge, 2015). Furthermore, rebuilding may provide children and youth with the opportunity to develop place-related mastery and environmental competence, which are key aspects of place-influenced development. Indeed, places that young people can create, change, and manipulate are often those most remembered and loved, such as self-made forts in the woods that can transform into make-believe houses, restaurants, or hideouts, as opposed to pre-made playsets whose purposes are more limited and physically cannot be changed (Cooper Marcus, 1992). Despite this, adults rarely include young people in the decision-making about rebuilding (Bartlett, 2008), but we expect that providing children and youth with such opportunities would likely aid in the repair of disaster-disrupted developmental processes, like mastery,

contribute to post-disaster reformation of place attachment, and further impact their recovery and sense of resilience. Child and youth-inclusive place-rebuilding programs are thus a promising action-oriented research area.

Continuity and Symbolic Function

For adults who cannot rebuild or return to their important places, previously established place ties can still contribute to recovery though their impacts on continuity. Self-continuity is the psychological need for the self to maintain consistency, often through a coherent "story' that connects past and present events and behaviors, despite changes in one's life (Hallowell, 1955). Disasters threaten this stability by disrupting ongoing roles, routines, goals, and identity (e.g., Fullilove, 1996). However, place can preserve continuity in at least two ways. One is through "settlement identity" (i.e., Feldman, 1990), where individuals become attached to a particular *category* of places (e.g., rural towns or single family dwellings) rather than to a specific place. Similarly, individuals may seek features in new places that resemble the old places, such as the climate (Knez, 2005), or community values (Twigger-Ross & Uzzell, 1996). Another way of re-establishing disrupted continuity is by incorporating the damaged place of attachment into one's personal narrative; the place is therefore not lost, but becomes a temporal-spatial chapter in one's autobiography (Twigger-Ross & Uzzell, 1996).

Sources of continuity, however, vary with age; narrative/autobiographical-based continuity is thought to be limited until adolescence (e.g., Ball & Chandler, 1989). Research on place disruption shows that youth can benefit by maintaining symbolic ties to a previous place, such as by bringing objects from that place to the new place, or by seeking out places that resemble their old place (Ryan & Ogilvie, 2001), but this interchangeability effect has not yet been examined in the context of disaster recovery.

Nevertheless, two related studies revealed that the symbolic use of place is important to youth's disaster recovery (citations omitted for blind review). Youth from four disaster-affected communities in Canada and the United States used place as a metaphor for recovery and resilience. For example, youth who had experienced the 2011 Joplin tornado described how commercial spaces, such as franchises, were the first to rebuild after a disaster, and symbolized renewal, and a return to normal life. Others were inspired by a cross on a local church that had withstood several disasters, representing hope for themselves and the community. This demonstrates that Cox and Perry's (2011) model of place as a re-orienting source following a disaster likely applies not only to adults, but also to youth.

A related way that place can offer symbolic aid in disaster recovery and resilience is by providing a venue that commemorates the disaster. Place-based physical manifestations of traumatic events can symbolize the losses, either at the site of the disaster, or at a new site (e.g., Manzo, 2003). These sites may be informal, such as the empty lot of a house lost in a forest fire, or formal, such as a public memorial. For example, the 1976 Tangshan earthquake in China, one of the 20th Century's deadliest natural disasters, is commemorated in the Tangshan Earthquake Memorial Park, which includes a museum and a 300-meter-long "wailing wall" inscribed with the names of the victims. By symbolizing the event, memorials honor those who died, create a community of survivors, recognize shared and individual experiences and losses, and serve as a physical manifestation of the loss that can be faced (Svendsen & Campbell, 2010; Watkins, Cole & Weidemann, 2010). Interestingly, memorials of traumatic events can help reduce survivors' post-traumatic stress disorder symptoms if visited repeatedly, as Watkins et al. (2010) demonstrated in their study of the Vietnam Veterans Memorial in Washington, DC, although this effect has not yet been explored among disaster victims. The symbolic function of important post-disaster places and memorials may be especially important for children and youth, allowing them to better remember and maintain continuity to their pre-disaster lives, thus, structuring and incorporating the disaster into their personal place-based narratives, although again, this may vary by age.

Form New Bonds

Other than relying on pre-existing or symbolic place bonds, forming new place bonds can help ease place attachment disruptions in children and youth. For example, Italian college students living away from home were less homesick when they developed an affective bond to the new place (Scopelliti & Tiberio, 2010). Forming new place bonds can be aided by gaining a sense of control over the new environment, such as by personalizing one's new space (Tognoli, 2003), and by identifying the similarities between the old and new place (Fisher, Murray & Frazer, 1985). Absolute levels of satisfaction with the new environment are also important. In one study, youth immigrants from the former Soviet Union to Israel who preferred more physical attributes of their new neighborhoods, cities, and country were more likely to be attached (Churchman & Mitrani, 1997). Furthermore, new places can aid in recovery when they possess features that are psychologically restorative, such as nature; refugee youth from 12 countries who arrived in Australia were found to actively seek out places in their new environment with such restorative qualities (Sampson & Gifford,

2010). This is important given that, as discussed, place-based restoration plays a key role in children and youth's emotional development (Korpela & Hartig, 1996; Korpela et al., 2002).

Few studies have investigated the importance of new place bonds to the recovery of *disaster*-affected children and youth, but those that have, are supportive. For example, schools are central to children and youth's disaster recovery and long-term resilience, especially among those who have been displaced (Vernberg et al., 1996; Wolmer, Laor, Dedeoglu, Siev & Yazgan, 2005). In one study, Katrina-affected youth who felt more attached to their new school experienced less emotional and physical discomfort, fewer threats to their achievement, and less negative peer pressure than did those who were less attached (Barrett et al., 2008). Their new school provided social support, resources, and served as a potential new secure base as they navigated a new environment.

New schools and other new places can sometimes support resilience when they offer better opportunities or environments than were in place prior to the disaster (e.g., Fothergill & Peek, 2006). Relocated Katrina students who perceived that that the new school was safer and of better quality took fewer risks and felt that their academic achievement was less threatened than did students who were less satisfied with the attributes of their new school (Barrett et al., 2008). Additional empirical evidence is needed to identify the mechanisms through which new places support post-disaster resilience (i.e., secure base and/or need satisfaction).

Additional Areas for Future Research

The present synthesis has proposed key principles of place attachment that relate to children and youth's disaster preparedness, experience, recovery, and resilience (see Table 1), as well as a number of specific areas for future research. In addition, several broader future research foci remain. One issue relates to internal validity concerns. While place attachment holds great utility at bolstering the theorizing underlying psychological disaster phenomena, alternative explanations cannot be ruled out. Some of these alternative explanations (e.g., such as political or infrastructural barriers underlying evacuation failure, rather than solely place attachment), have already been discussed herein. However, without experimental approaches, place attachment cannot be viewed as a causal factor, but rather should be considered as one of many possible causal factors in disaster resilience phenomena. Experimental approaches have recently entered the place attachment literature (Scannell & Gifford, 2016), offering new tools such as place-

Table 1 Children and youth's place attachment-relevant experiences, pre, during, and post disaster

	Findings	Key Message
Pre- disaster place-based resilience	• Places that support pre-disaster development may offer a protective effect • Place ties could motivate young people's engagement in disaster preparedness • Place attachment may improve the ability to detect and address local hazards	• Place ties likely increase children and youth's pre-disaster resilience
Disaster-disrupted place attachment (PA)	• Disrupted PA can increase stress-related illness, asthma, access to medical care, PTSD • Place disruption can cause grief, disorientation • Place disruption also disrupts social relationships and cultural practices • Place disruption is associated with risky behaviors and fewer protective behaviors • Disrupted PA can negatively impact learning and academic achievement	• Damaged or lost places can be associated with a number of negative biopsychosocial outcomes
Place-based post-disaster recovery and resilience	• Places can support post-disaster development • Place ties can help leverage social capital • Participation in rebuilding and reconstruction can support recovery • Important places can provide continuity despite disruption • Places can symbolize the disaster, and associated recovery and resilience processes • New places can help ease place disruptions	• Place ties can support young people's resilience in a number of ways

based visualizations that allow place attachment to be treated as a manipulated independent variable. Such designs offer promise for establishing internal validity, but need to co-occur with field research, particularly in disaster contexts which are difficult to simulate.

We have highlighted the importance of place attachment to young people's experiences, acknowledging context as a contributing influence, but have noted that relatively few studies focusing on place attachment and young people's disaster experience highlight and unpack the role of context. Additional work is needed to further examine the ways in which various socioecological contexts (e.g., social, economic, political, and spiritual), shape young people's place-based disaster experiences.

Within context, geographical scale of place attachment also appears to be a variable of interest. Indeed, place attachment has been described at varying geographical scales, and the strength of place attachment has been found to vary by scale (e.g., Hidalgo & Hernández, 2001; Lewicka, 2008; Rollero & De Piccoli, 2010). While researchers have called for additional studies examining geographical scale (e.g., Lewicka, 2011), it has not been explored much within the place attachment disaster literature, including those studies that focus specifically on children. Thus, another promising area of further research would be to investigate the *development* of place attachment across geographical scales. Following this, researchers might explore how adults' and young peoples' place attachment-related disaster experiences differ by geographical scale. The present review represents the first step in identifying key place and disaster processes, which can then be further explored with additional moderation analyses.

Conclusion

Children and youth's experiences of disasters influence, and are influenced by, place attachment phenomena. Prior to a disaster, place attachment can contribute to their resilience through its impacts on their healthy development, hazard detection, and motivation to prepare and communicate preparedness options to families. It is also important to note that these strong connections may have negative implications for preparedness and response. During a disaster, disruption of place attachment bonds, whether through displacement, disruption, or damage, can result in grief and other significant emotional, physical, and social outcomes. However, the place-specific mechanisms underlying these effects, such as dysregulation of biopsychosocial systems (e.g., Sbarra & Hazan, 2008) have not yet been identified, in part because much of this work remains disconnected from existing theoretical frameworks. Following a disaster, a number of paths through which place attachment contributes to recovery and resilience have been identified, including the ability of important places to assist with psychological need satisfaction and development, the impact of community ties on children and youth's access to resources, the ability of places and memorials to offer continuity and symbolize hope, and the role of the newly formed place attachment bonds in psychological restoration and providing new opportunities. To lend additional support to these processes, a number of avenues for future research have been identified, and they may also inform key place-based, youth-relevant interventions for disaster-affected communities.

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