Before and after a natural disaster: Disruption in emotion component of place-identity and wellbeing

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ABSTRACT

The aim was to investigate relationships between emotion and cognition components of place-identity and wellbeing, before and after a natural disaster. A total of 656 respondents, living near the area of the largest forest and landscape fire in modern times in Sweden, participated in this study. Before the disaster, a positive association was found between place-identity and wellbeing, indicating that the stronger emotions participants evolved to the place, as well as remembered more and thought about the place, the stronger wellbeing they experienced at the site. After the disaster, the strength of this relationship decreased more than twice, accounted for by the weakening of the emotion-wellbeing link. Accordingly, participants almost lost their emotional bond to the area but maintained their memories and thoughts about the site intact and, by that, their positive wellbeing associations with the location. This indicates tentatively the phenomenon of post-traumatic growth, type of resilience involving operations of cognitive appraisal.

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1. Introduction

News about floods, heat waves, storms, and fires and their impact on society reach us almost every day, implying that “disasters signal the failure of a society to adapt successfully to certain features of its natural and socially constructed environment in a sustainable fashion” (Oliver-Smith, 1996 p. 303). A natural disaster is not only an ecological and economic catastrophe, but also a social and psychological one (Schmuck & Vlek, 2003). Psychological research on environmental issues has, for example, reported findings on environment-related risk perception (Slovic, 2001), risk judgment (Bannes & Bonaiuto, 2002), ethics (Karpik & Baril, 2008), risk and affect (Slovic & Peters, 2006), resource dilemmas (Aitken, Chapman, & McClure, 2011), value orientations (Schultz, 2001), and affect (Knez, 2013; Leiserowitz, 2006). Knez, Thorsson, and Eliasson (2013) showed, furthermore, that women and the young, compared to men and the elderly, were more concerned for, and afraid of, the consequences of environmental issues, and Knez (2013; 2016a) reported that egoistic individuals were more worried about myself than others environment-related issues and that the opposite effect applied for the altruistic persons. (see Fig. 1)

Moreover, it is indicated that after a natural disaster many individuals experience positive changes in their selves and lives, a phenomenon of posttraumatic growth (Tedeschi & Calhoun, 1995; Joseph & Williams, 2005; Hefferon Grealy, 2009), as well as emotional and health-related problems (Evans & Kantrowitz, 2002; Martin, 2015; Stern, 1976). For example, Adams and Adams (1984) reported a significant increase in illness and stress after a volcano eruption catastrophe, and Galupp Poll, (2013) indicated an increase in depression levels after the Hurricane Sandy. Similarly, Graham (2012, p. 15) reported an “emotional aftermath” of Sandy involving emotional states of hopelessness and anxiety. Natural disasters have been shown to have a negative impact on place-identity (“significant places” related to individual and collective identity), leading to emotions of loss and grief (Ruiz & Hernandez, 2014) that result in the “loss or a removal of a community from its ground” (Oliver-Smith, 1996 p. 308). Accordingly, all this points to the long-term effects of natural disasters on human wellbeing and...
Disasters affect our cognitions too (Helton, head, & Kemp, 2011), such as memory, and especially autobiographical memory which is a cognitive basis for the identity construction and maintenance of who we are and where we belong (Brown et al., 2009; Knez, 2017). We also remember these catastrophes for a long time (Schuman & Scott, 1989), which might trigger the phenomenon of “flashbulb memories” (Brown & Kulik, 1977). This is a type of collective remembering of “emotionally-charged” public incidents (Brown et al., 2009), such as September 11 attacks (Luminet et al., 2004; Pezdek, 2003), indicating general psychological impacts that do not differ, according to some findings (Conway, Skirka, Hemmerich, & Kershaw, 2008), with gender, age, education, and geographical region.

Finally, losing a link to and longing for (melancholia) an appreciated and beloved place is commonly defined as nostalgia (a psychoterratic illness). A psychoterratic illness of suffering the loss of a cherished place without being displaced is called solastaliga (Albrecht et al., 2007). Accordingly, a nature-related distress of solastaliga might be implicated when people remain in the disaster area, experiencing a devastating physical change of their home-related environment. Several studies have indeed indicated the psychological role of the place after a dramatic change of the environment including feelings of loss (Ruiz & Hernandez, 2014), association between psychological distress and solastaliga (Eisenman, McCAffrey, Donatello, & Marshal 2015), but also positive feelings of social unity and optimism (Silver & Grek-Martin, 2015). The latter finding is in accordance with the “growth following adversity” research recognizing positive changes (type of resilience) following traumatic events (Joseph, 2009).

1.1. Place-identity and wellbeing

Humans develop bonds to physical places (e.g., Jorgensen & Stedman, 2001; Scannell & Gilford, 2010; Droselits & Vignoles, 2010; Lewicks, 2011) that embody natural, psychological, social, historical, religious, cultural, and wellbeing dimensions (Graumann, 2002; Knez, 2005; Knez, Thorsson, Eliasson, & Lindberg, 2009; Lachowycz & Jones, 2013; Sarløf-Herlin, 2007; Butler & Åkerskog, 2014; Ratcliffe & Korpela, 2017; Morton, van der Bles, & Haslam, 2017). This suggests that places in our lives may locate our past, present and future; triggering the first-person epistemological question of how we come to know who and what we are (Klein, German, Cosmides, & Gabriel, 2004). In other words, physical places aid our self-formation (Knez, 2014) by reminding us of important personal and collective experiences, events, traditions and memories, by which we uphold and strengthen different types of identifications (Lewicka, 2008, 2014; Wang, 2008). Identity is grounded in the autobiographical memory (Conway, 2005; Fivush, 2008; Knez & Nordhalm, 2017; Knez, Ljunglöf, Arshamian, & Willander, 2017), resulting in a “feeling that we are re-living our past” (Klein, 2013, p. 3).

This type of cognitive activity is characterized as a life story (Fivush, 2008), involving several context-specific selves/identities (Knez, 2016b; McConnell, 2011; Stobbelaar & Pedroli, 2011) that might comprise cognitive processes of mental temporality, coherence, correspondence, reflection, and agency (Conway, Singer, & Tagini, 2004; Klein et al., 2004), and the process of attachment/belonging/closeness accounting for the phenomenological experience of place-of-mine to which I bond emotionally (Knez, 2014). Thus, we do not only think, remember and reflect on places (cognitive component of place-identity) in our lives, but we also feel emotionally attach and close (emotion component of place-identity) to these sites (Marris, 1982).

Previous research has, moreover, shown that place-related identifications include nature-related details (Knez, 2005; 2006), suggesting that “natural or semi-natural features of the environment are often associated with the identity of an individual.” (Daniel et al., 2012, p. 8814). In line with this, Knez and Eliasson (2017) revealed that when visiting favorite natural sites (incorporating strong place-identity) people experience high levels of wellbeing suggesting that the go-greener-feel-better relationships (Carrus et al., 2015) might to some degree be accounted for by the psychological mechanisms of people-place bonding. All this is consistent with previous findings suggesting that human wellbeing benefits from nature-related dimensions in both rural and urban settings (Bowler, Buyung-Ali, Knight, & Pullin, 2010; Abraham, Sommerhalder, & Abel, 2010; Hartig et al., 2011; Bratman, Daily, Levy, & Gross, 2015; Sandifer, Sutton-Grier, & Ward, 2015; Ode Sang, Knez, Gunnarsson, & Hedblom, 2016; Hedblom, Knez, Ode Sang, & Gunnarsson, 2017; Gunnarsson, Knez, Hedblom, & Ode Sang, 2016); as a consequence, promoting processes of affect-regulation in natural milieus defined as favorite places (Knez & Eliasson, 2017; Korpela, Ylén, Tyrväinen, & Silvennoinen, 2008; Parkinson & Totterdell, 1991; Ratcliffe & Korpela, 2017).

1.2. Present study

Most of the disaster research has focused on the phenomena of risk perception, post-traumatic stress, and coping (e.g., Bonaiuto, Alves, de Dominicis, & Petruccelli, 2016; Bonnano, Brewin, Kaniasty, & La Greca, 2010; Dominicis de, Fornara, Cancelleri Ganucci, Twigger-Ross, & Bonaiuto, 2015; Shavit, Shahrabani, Benzon, & Rosenboim, 2013). This study will, on the other hand, investigate the links between peoples’ place bonding before and after a natural disaster. We posed the following question: How does a natural disaster impact on the emotion and cognition components of place-identity and wellbeing, suggesting that the go-greener-feel-better relationships (Carrus et al., 2015) might to some degree be accounted for by the psychological mechanisms of people-place bonding. All this is consistent with previous findings suggesting that human wellbeing benefits from nature-related dimensions in both rural and urban settings (Bowler, Buyung-Ali, Knight, & Pullin, 2010; Abraham, Sommerhalder, & Abel, 2010; Hartig et al., 2011; Bratman, Daily, Levy, & Gross, 2015; Sandifer, Sutton-Grier, & Ward, 2015; Ode Sang, Knez, Gunnarsson, & Hedblom, 2016; Hedblom, Knez, Ode Sang, & Gunnarsson, 2017; Gunnarsson, Knez, Hedblom, & Ode Sang, 2016); as a consequence, promoting processes of affect-regulation in natural milieus defined as favorite places (Knez & Eliasson, 2017; Korpela, Ylén, Tyrväinen, & Silvennoinen, 2008; Parkinson & Totterdell, 1991; Ratcliffe & Korpela, 2017).

It has been shown (Brown & Perkins, 1992), that processes of developing a place-identity, losing it, and later coping with that by creating a new one, may be understood in relation to the processes of a stability-change-progression; including: (a) pre-disruption of place-identity - involving evolvement, sustainment, and potency of the place-identity; (b) disruption of place-identity - including different types of disruptions associated with emotional, behavioral, and cognitive responses; and (c) post-disruption of place-identity - containing processes of coping with the loss and re-establishing
new place-identity.

In agreement with: (a) previous findings on the positive relationships between nature and wellbeing (Abraham et al., 2010; Bowler et al., 2010; Bratman et al., 2015; Hartig et al., 2011; Sandifer et al., 2015); (b) a positive link between place-identity and wellbeing (Knez & Eliasson, 2017; Knez, 2006; Knez et al., 2017; Korapelko, 1992); (c) that revisiting favorite places in nature might include processes of affect-regulation (Knez & Eliasson, 2017; Parkinson & Totterdell, 1991), and (d) that people-place bonding plays a role in disaster issues (Ruiz & Hernandez, 2014; Silver & Grek-Martin, 2015), we investigated relationships between emotion and cognition components of place-identity and wellbeing before and after a natural disaster (the largest forest and landscape fire in modern times in Sweden).

1.2.1. Hypotheses

Following on Knez and Eliasson (2017), we predicted a positive association between place-identity and wellbeing before the natural disaster, and along the lines of Brown and Perkins (1992), Oliver-Smith (1996), and Ruiz and Hernandez (2014) we predicted a disruption in this positive link between place-identity and wellbeing after the natural disaster. Given that the emotion-wellbeing compared to the cognition-wellbeing link may be stronger (Knez & Eliasson, 2017; Knez, 2014), we predicted a stronger decline in emotion vs. cognition component of place-identity too. Finally, and as far as we know, no research has previously addressed these issues.

2. Method

2.1. Study site

On the 31st of July 2014, a small forest fire was carelessly ignited during forestry work in Västmanland County, Sweden (59°54′N, 16°09′E). Due to a variety of management and weather factors, the fire quickly spread to become the largest forest fire in modern times in Sweden.

By the 5th of August, the fire had covered an area of approximately 14 000 ha (equivalent to almost 20 000 football/soccer pitches) and affected four different municipalities. The fire claimed the life of one forest worker, destroyed over 20 houses, required almost 1200 people to be evacuated, and forced 4500 people to stand-by for urgent evacuation. Twelve days after the initial event, on the 11th of August, the fire was finally considered to be under control. Furthermore, the fire “decimated a vast area of production forest, affected over 200 forest owners; destroyed key biotopes, severely impacted (and revealed many new) archaeological sites and brought about a variety of physiological changes including depletion of topsoil and silting of watercourses” (Butler et al., 2017, p. 1).

2.2. Sample

A total of 2264 households living nearby the disaster area were sent a survey, one year after the fire. They were randomly identified from a register of population. Accordingly, the survey was not sent to a randomly identified stratified sample with relevant population demographics across the four municipalities, but to randomly identified households living close to the fire area; because these individuals were the first and foremost affected ones. For example, Ruiz and Hernandez (2014) reported negative changes in people-place bonding and naturalness only in people living nearby a volcano eruption. The survey comprised several sections, including questions about landscape-related activities, experiences, perceptions, and attitudes before, and after, the fire. It was conducted in accordance with APA’s (American Psychological Association) ethics code.1 After 3443 reminders, 656 (29%) replies were obtained; involving 48.4% women and 51.6% men, distributed across seven age groups of 18–25 (3%), 26–35 (5.6%), 36–45 (10.2%), 46–55 (15%), 56–65 (26.4%), 66–75 (28.9%), and 76–85 (10.9%). Data on place-related identity and wellbeing before, and after, the fire will be reported in this study.

2.3. Measures

2.3.1. Place-identity

This instrument includes ten statements, measuring emotion and cognition components of place-identity (Knez & Eliasson, 2017; Knez, 2014), with a Cronbach alpha of 0.93 for the entire instrument and 0.85 and 0.88 for emotion and cognition components respectively. Emotion component (processes of attachment/close-ness/belonging): “I am keenly familiar with the place.”; “I miss it when I’m not there.”; “I have strong ties to the place.”; “I am proud of the place.”; “The place is a part of me.”. Cognition component (processes of coherence, correspondence, mental temporality, reflection and agency): “I have had a personal contact with this place during a long period.”; “There is a link between the place and my current life.”; “I can travel back and forth in time mentally to this place when I think about it.”; “I can reflect on the memories attached to this place.”; “These thoughts about the place are part of me.”. Participants were asked to respond to these statements on a 7-point scale, ranging from 1 (completely disagree) to 7 (completely agree), related to their place-experiences before and after the fire.

2.3.2. Wellbeing

This includes ten statements from “The WHO (ten) wellbeing index” (Beach, Gudex, & Staeher Johansen, 1996), with a Cronbach alpha of 0.91. Respondents responded to the question of when I’m on the site, I feel: “Sad and down” (Reversed); “Calm and relaxed”; “Energetic, active and enterprising”; “Relaxed and refreshed” ; “Happy and pleased with my personal life”; “Satisfied with my living situation ”; “I live the life I want to live”; “Inspired to deal with today’s work”; “I can cope with serious problems or changes in my life”; “That life is full of interesting things.”. Furthermore, the 4-point scale from the original measure was replaced by a 7-point scale, ranging from 1 (completely disagree) to 7 (completely agree), related to participants’ place-wellbeing-experiences before, and after, the fire.

2.4. Design and analyses

In line with our hypotheses, two regression analyses were performed to investigate: (a) the links between emotion and cognition components of place-identity (predictors) and wellbeing (criterion variable) before the fire; and (b) the links between emotion and cognition components of place-identity (predictors) and wellbeing (criterion variable) after the fire. Before-the-fire-reports were gathered one year after the fire (The survey was sent one year after the disaster.). Even though, we assume that these data were not subjected to memory errors (Shadish, Cook, & Campbell, 2002) because current self-reports of accurately recalled events with a

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1 Participants were informed about: (a) the objectives of the research project and the survey; (b) participants’ right to withdraw from the participation at any time without any consequences; (c) factors that may influence their willingness to participate, such as, how long it will take to complete the questionnaire and information about the types of questions involved; (d) confidentiality; (e) that they will not be financially compensated for participation in the survey; and (f) whom to contact about any questions related to the research project and survey.
dated and salient “surrounding context” are reliable data (e.g., Gutek, 1978; Loftus & Marburger, 1982).

3. Results

3.1. Before the natural disaster

As can be seen in Table 2, a significant relationship between place-identity and wellbeing showed that psychological mechanisms of people-place bonding accounted for 35% of variance in wellbeing before the natural disaster. Similar links between emotion vs. cognition component and wellbeing were indicated (see β statistics in Table 2, indicating the slope of the regression lines). Thus, both components (emotion + cognition) of place-identity were positively associated with wellbeing (see Tables 1 and 2). This means that the stronger the attachment/belonging/closeness (emotional component) residents felt to the landscape before the fire the more wellbeing they perceived in that place. Similarly, the more remembrance, thinking and mental travel (cognitive component) residents directed to this site before the fire the more wellbeing they perceived in that place.

3.2. After the natural disaster

As above, both components (emotion + cognition) of place-identity were positively associated with wellbeing (see Tables 3 and 4). A significant link between place-identity and wellbeing was, likewise, reported after the natural disaster (see Table 4). The strength of this relationship decreased, however, more than twice as much than before the natural disaster (from 35% to 16% explained variance; compare R² statistics between Tables 2 and 4). Moreover, and after the natural disaster, a stronger link between cognition (β = 0.29) vs. emotion (β = 0.14) component and wellbeing was shown (See β statistics in Table 4, the greater the magnitude of the slope, β, the steeper the line and the greater the influence.).

However, and as can be seen in Fig. 3, all decrease in the relationship between place-identity and wellbeing was accounted for by the weakening of the emotion-wellbeing link after the natural disaster. No decrease was, however, indicated between cognition component and wellbeing after the natural disaster (see Fig. 4). See also the slope (β) statistics (Tables 2 and 4) which indicate that for each step in X-axis (place identity), the wellbeing score (Y-axis) increases, on average, by 0.32 (emotion before) vs. 0.14 (emotion after) points. The decline in wellbeing after the fire was additionally shown to be significant, t(473) = 10.18, p < 0.001 (before fire M = 4.54 SD = 1.5 vs. after fire M = 3.89 SD = 1.5).

Table 1
Correlation matrix for predictors (emotion + cognition) and criterion variable (wellbeing) before the fire.

<table>
<thead>
<tr>
<th></th>
<th>Emotion</th>
<th>Cognition</th>
<th>Wellbeing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotion</td>
<td>1</td>
<td>0.88†</td>
<td>0.57†</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>550</td>
<td>541</td>
<td>489</td>
</tr>
<tr>
<td>Cognition</td>
<td>0.88†</td>
<td>1</td>
<td>0.58§</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>541</td>
<td>544</td>
<td>479</td>
</tr>
<tr>
<td>Wellbeing</td>
<td>0.57†</td>
<td>0.57†</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>481</td>
<td>479</td>
<td>508</td>
</tr>
</tbody>
</table>

* Correlation is significant at the .01 level (2-tailed).

Table 2
Regression statistics for the relation between place-related identity (emotion and cognition) and wellbeing, before the natural disaster.

<table>
<thead>
<tr>
<th></th>
<th>R²</th>
<th>Beta (β)</th>
<th>SE</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.35</td>
<td></td>
<td>2475</td>
<td>194.47</td>
<td>128.32</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.32 (emotion)</td>
<td>0.06</td>
<td>4.36</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.30 (cognition)</td>
<td>0.05</td>
<td>4.06</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 3
Correlation matrix for predictors (emotion + cognition) and criterion variable (wellbeing) before the fire.

<table>
<thead>
<tr>
<th></th>
<th>Emotion</th>
<th>Cognition</th>
<th>Wellbeing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emotion</td>
<td>1</td>
<td>0.79†</td>
<td>0.37†</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>527</td>
<td>523</td>
<td>482</td>
</tr>
<tr>
<td>Cognition</td>
<td>0.79†</td>
<td>1</td>
<td>0.39§</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>523</td>
<td>532</td>
<td>479</td>
</tr>
<tr>
<td>Wellbeing</td>
<td>0.37†</td>
<td>0.39§</td>
<td>1</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>482</td>
<td>479</td>
<td>505</td>
</tr>
</tbody>
</table>

* Correlation is significant at the .01 level (2-tailed).

Table 4
Regression statistics for the relation between place-related identity (emotion and cognition) and wellbeing, after the natural disaster.

<table>
<thead>
<tr>
<th></th>
<th>R²</th>
<th>Beta (β)</th>
<th>SE</th>
<th>df</th>
<th>MS</th>
<th>F</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.16</td>
<td></td>
<td>2477</td>
<td>85.46</td>
<td>45.87</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.14 (emotion)</td>
<td>0.06</td>
<td>2.04</td>
<td>0.04</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.29 (cognition)</td>
<td>0.05</td>
<td>4.24</td>
<td>0.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Discussion

The aim of this study was to investigate relationships between place-identity and wellbeing, before and after the largest forest and landscape fire in modern times in Sweden. In line with previous findings we predicted that the phenomenon of people-place bonding plays a significant role in natural disaster issues (Ruiz & Hernandez, 2014; Silver & Grek-Martin, 2015). More precisely, we predicted: (a) positive association between place-identity and wellbeing before the natural disaster; (b) disruption in this link after the natural disaster; and (c) stronger decline in emotion vs. cognition component of place-identity (Brown & Perkins, 1992; Knez & Eliasson, 2017; Knez, 2014). The results obtained were consistent with these hypotheses. One limitation of this study is
that is about forest fire. It is therefore problematic to generalize its results to all types of natural disasters. In spite of this, the results obtained reveal the psychological role of a cherished place after its devastating change.

Before the disaster, a positive association was found between place-identity and wellbeing, indicating that the stronger attachment/closeness/belonging (emotion component of place-identity) participants evoked to the area, as well as remembered more and thought about the site (cognition component of place-identity), the stronger wellbeing they experienced visiting the location. This is in line with previous findings, showing that we invest emotionally and cognitively in physical places (Knez et al., 2014; Marris, 1982; Stobbeal & Pedroli, 2011), and that this type of people-place bonding involves natural features (Daniel et al., 2012; Knez, 2005, 2006). In agreement with (Knez & Eliasson, 2017), we also reported that relationships between place-identity and the surrounding nature involved high levels of wellbeing, indicating that go-greener-feel-better links (Carrus et al., 2015) are to some degree accounted for by the psychological mechanisms of people-place bonding. In addition, this implies that revisiting nature as favorite sites might involve the processes of affect-regulation (Parkinson & Totterdell, 1991).

After the disaster, the strength of the place-identity wellbeing link decreased more than twice, accounted for by the weakening of the emotion-wellbeing relation. This indicates that, after the disaster, participants almost lost their emotional bond to the area and in doing so associated a lower level of wellbeing with the site. On the contrary, participants maintained their cognition-wellbeing link intact, by which they kept their memories and thoughts about the place and, thus, upheld a higher level of wellbeing associated with the area. Previous research on psychological post-disaster reactions has, similar to our results, reported emotional responses (Stern, 1976; Adams & Adams, 1984; Evans & Kantrowitz, 2002; Galup Poll, 2013), labeled as “emotional aftermath” (Graham, 2012, p. 15) and/or “emotionally-charged” incidents (Brown et al., 2009); also involving expressions of loss and grief as related to place-identity (Oliver-Smith, 1996). Consistent with this, Ruiz and Hernandez (2014) showed a link between feelings of loss and a decline in place attachment (emotion component of people-place bonding; see Marris, 1982; Giuliani, 2003; Hidalgo & Hernandez, 2001; Knez, 2014) and restorativeness due to a volcano eruption; especially in residents living nearby (as in this study) disaster are. Similar findings have been reported by Silver and Grek-Martin (2015) and Eisenman et al. (2015) related to a tornado and a fire catastrophe respectively, involving the concepts of sense of place and solastalgia.

No previous research, as far as we know, has shown that, despite the emotional post-disaster decrease in place-identity and wellbeing, people still might cognitively bond with the area; indicating that the more they remembered and thought about the location, the stronger wellbeing they associated with the site, regardless of the consequences of the fire affecting four municipalities and covering 14,000 ha. This might, however, tentatively be consistent with the phenomenon of post-traumatic growth suggesting that in spite of the negative consequences of a disaster people can “change in positive ways in their struggle with adversity” (Joseph, Murphy, & Regal, 2012, p. 316), a process that is indicative for the operations of cognitive appraisal, triggering of our ability to move forward in a growthful way (type of resilience; see Joseph, 2009). This is furthermore consistent with a chain of positive psychological and social changes reported in people coping with distressing environmental incidents (Brown & Perkins, 1992; Silver & Grek-Martin, 2015).

Acknowledgments

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