

## 20 Post-bushfire relocation decision-making and personal wellbeing

A case study from Victoria, Australia

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### Introduction

Community-based disasters are collectively experienced events that overwhelm local capacity, resulting in the destruction of public, private, and environmental assets, human suffering, and disruption of systems.<sup>1</sup> Affected communities typically face a long period of restoration and recovery. It is often necessary for people to find temporary or permanent alternative accommodation, either within the disaster-affected community or in a different location.<sup>2</sup> This paper explores the impact of post-disaster relocation through a case study of bushfires that occurred in February 2009 in Victoria, Australia. It focuses on decision-making in relation to moving out of a disaster-affected community and the impact of that decision on personal wellbeing. Personal wellbeing is conceptualized in this case study as a combination of life satisfaction (current and anticipated), personal resilience, and subjective overall health rating. The psychological sense of community and its relationship to relocation decisions and experiences will also be explored.

Relocation is a complex phenomenon. The period of displacement may vary considerably; people may have to relocate more than once and experience different types and quality of accommodation. They may also have different levels of desire and control over whether to return and rebuild or relocate, and may experience various financial, environmental, and social stressors.<sup>3</sup>

The decision to relocate is often emotionally charged because of loyalties to neighbors, friends, and the local community<sup>4</sup> and attachments to the natural, social, cultural, and built environments.<sup>5</sup> The disaster experience of disruption and loss may invoke a stronger attachment to the local community amongst those affected.<sup>6</sup> Attachment is also likely to be influenced by length of time spent living in the community.<sup>7</sup> Attachment to place is interconnected with ontological security, social and psychological wellbeing, and sense of identity.<sup>8</sup> Ontological security refers to confidence in the continuity of social and material environments.<sup>9</sup> Dislocation of ontological security resulting from a disaster event can be compounded by relocation.<sup>10</sup>

The term “psychological sense of community” describes the degree of belonging and shared commitment felt by members of a community.<sup>11</sup> It is more than simple

attachment to place, as it involves multiple affective, cognitive, and behavioral elements that encompass interactive and dynamic relational aspects between the individual and the community.<sup>12</sup>

Post-disaster recovery efforts tend to have a geographic focus on affected areas. Services are located in a “hub” or recovery center and target local people. For residents to remain in or return to a community, basic services need to be provided, such as health care, schools, banking, and food stores, as well as employment opportunities. This promotes a return to routine and supports rebuilding and re-establishing social connections.<sup>13</sup> Those who move away may not have the same access to services or connection with recovery processes. Their new local services, being outside the affected areas, are unlikely to have the same level of disaster experience or access to information on the range of post-disaster support.

Increased understanding of risk and protective factors for those who stay, for those who are temporarily displaced, and for those who permanently relocate will enable more targeted programming for support services and enable better provision of information to support individual decision-making about whether to relocate. There is some evidence arising from studies of Hurricane Katrina, landslides in Venezuela, and flood events in North Carolina that loss and disruption associated with relocation can be minimized when people are able to see a future in their home and community and understand the steps involved in achieving it.<sup>14</sup>

According to the Internal Displacement Monitoring Center, 143.9 million people were newly displaced by disaster between 2008 and 2012.<sup>15</sup> Investigations of relocation have been relatively sparse, with gaps in the literature in terms of affected populations, disaster types, health and wellbeing outcomes, effective interventions, and even conceptual and definitional issues regarding the phenomenon itself.<sup>16</sup> These evidence gaps are likely to be due to a focus on the short-term effects of disaster, the paucity of pre-event data, considerable variability in the time frame over which relocation may unfold, and the challenges in tracing those involved.<sup>17</sup> There is evidence, however, that relocation entails greater risk for mental health problems.<sup>18</sup> People who are separated from their close social networks can experience reduced access to support and opportunities to provide support to others. Consequences can include loss of self-efficacy and control, a diminished sense of identity, and additional stressors associated with being distant from loved ones.<sup>19</sup> A systematic review of 40 empirical studies highlighted the health effects of dislocation, finding convergent evidence of association with increased psychological morbidity.<sup>20</sup> Various relocation factors that are likely to impact wellbeing outcomes include age,<sup>21</sup> the degree of choice about relocation,<sup>22</sup> distance from the original community,<sup>23</sup> and differential experiences within families over time.<sup>24</sup> Reports of positive relocation experiences are rare in the literature, but studies following Hurricane Katrina have included accounts of the benefits of increased safety and opportunities in new communities, despite cultural differences and the loss of social supports.<sup>25</sup>

### **“Black Saturday” fires**

In February 2009, bushfires raged across the State of Victoria in southern Australia, with the worst occurring on Saturday, February 7, resulting in the “Black Saturday” descriptor. This disaster represents one of Australia’s worst, with 173 fatalities, 3,500 buildings damaged or destroyed, significant impact on high-value natural

environments, and massive adverse impact on community infrastructure.<sup>26</sup> Two townships were completely destroyed and others sustained significant damage.

Many people in bushfire-affected areas were forced to seek temporary accommodation when their homes were damaged or destroyed. The State Government provided a range of housing assistance options, including temporary living expenses grants; 124 caravans provided for use on people's own blocks of land; movable units (four were utilized); access to public housing (for approximately 118 families); and temporary villages established in the center of bushfire-affected communities (utilized by approximately 314 people). Rental charges for accommodation in the temporary villages (approximately \$40 AUD per week for individuals and \$100 AUD per week for families) were waived in cases of hardship. The final temporary village closed in June 2012, more than three years after the fires, with remaining families moved into public housing as required.

Others made their own arrangements, staying in privately rented accommodation, with family or friends, in another property they owned, or in caravans or sheds on their bushfire-affected land until homes could be rebuilt or a decision was made to relocate. Residents were free to decide whether to stay in the community or relocate, although, as noted earlier, there were many factors influencing that decision. A non-compulsory buy-back program was introduced by the Victorian government in March 2012, offering money for high-bushfire-risk properties where a house had been destroyed.

### The *Beyond Bushfires* study

The *Beyond Bushfires: Community Resilience and Recovery* study is a large-scale, multi-method longitudinal survey of community and individual health, wellbeing, and social connectedness in the wake of the "Black Saturday" fires.<sup>27</sup> It involves academic, community, government, and service provider partners. It recruited over 1,000 participants originating from 25 bushfire-affected communities in ten locations in rural and regional Victoria. A range of communities was selected, including high-impact (many houses lost plus fatalities), medium-impact (a small number or no fatalities, but significant property damage), and low-impact (no evidence of fires being present) areas. Community diversity was also sought in terms of population sociodemographics, size of community, and distance from the capital city of Melbourne.

The *Beyond Bushfires* study team commenced regular community visits in 2010 to ensure an understanding of local issues and contextual influences. Surveys were administered in 2012 and 2014 (only 2012 data were used for this case study), and in-depth interviews were conducted during 2013–14. Tracing those who had relocated was a challenge because of a lack of records of who had moved and where. Privacy regulations prevented agencies, including the police and state government, from releasing relevant contact lists such as those who had been eligible for bushfire relief grants. Following negotiation, the Victorian Electoral Commission (VEC) provided the contact details of both current residents and those who had relocated since the fires (N = 7,467 adults) for an agreed fee. Strict conditions applied, including access to contact details for three weeks only and permitting only one invitation letter to be sent to each potential participant. No reminders could be sent. Recruitment was complemented by further outreach to raise awareness of the study and ways to register, including area-based phone calls, mailbox drops, news media, the study website, emails through community networks, and social media activities.

The emotional intensity of deciding whether to relocate and the need for more information about the impact of doing so first became apparent in community visits. Questions relating to relocation were therefore included in the *Beyond Bushfires* survey. Relocation issues were further highlighted in the in-depth interviews, which helped to direct the analysis of survey data. This flow in the research process will be reflected in the following reporting of findings.

### ***Beyond Bushfires* qualitative interviews**

The in-depth interviews involved a sub-sample of the survey participants who indicated a willingness to be interviewed. They were purposively selected from high-impact communities, with a variety of perspectives sought in terms of demographics and residential location. Following data collection and concurrent analysis, further participants were sought to explore emerging themes, including the experiences of those who had relocated. In some cases this included community members who had not previously participated in the study survey.

Participant-guided mobile methods were used to explore participants' current sense of place and community. They involved an in-depth interview with the participant, combined with a walking or car-driven tour around their property or local area, guided by the participant, to view and discuss places, things, and events of importance to them. A detailed account of these methods is reported elsewhere.<sup>28</sup> Three researchers (LG, KB, ES) conducted the interviews in pairs. Some people were interviewed with family members, e.g., as a couple or a parent with a child, according to their preference.

Detailed memos were recorded by the interviewers immediately after the interviews to capture initial impressions and insights from the interview.<sup>29</sup> This supported a subsequent thematic coding of the transcripts jointly by the three interviewers, with differing interpretations discussed until consensus was reached. Coding was conducted concurrently with data collection to allow for exploration of emerging themes through subsequent participant recruitment and interview discussions.<sup>30</sup> The data relating specifically to relocation were then further coded and categorized to allow for a more in-depth examination of decision-making and experiences relating to staying or leaving the bushfire-affected community.<sup>31</sup> Categorized data were then compared and contrasted to develop a conceptual understanding of participant perspectives on relocation. Quotes are used in the reporting of results to illuminate the findings. Names have been changed to maintain anonymity as far as possible.

The final interview sample was 35 participants in 25 interviews (18 males and 17 females), ranging in age from 4 to 66 years. All were from high-bushfire-affected communities. Four of the families had relocated to other communities since the bushfires.

### **Interview findings**

The strongest theme emerging from the interviews with regard to relocation was the importance of a sense of community. Choices to stay in the community arose from a strong commitment to place and people, often enhanced by the shared experience of the bushfires. For those who chose to leave, their sense of community had been damaged by physical changes to the built and natural environment; by painful memories

associated with the disaster and related events; and by a negative social environment arising from bitter debates and arguments over choices made at the time of the fires and/or decisions about community rebuilding and allocation of recovery funds:

it'll never be the same town. . .it feels like a really stressful place to be for a lot of different reasons. . . . One of the main things is arguing about where things ought to be and how things ought to happen. . . . We ended up selling our block of land and that was a really hard decision to make. It took a long time.

As previously reported in relation to the experiences of children and young people,<sup>32</sup> some people referred to a need to remain in the community to feel safe; others needed to move away from the risk of future bushfires:

My thought of going back was needing something familiar and safe, which is probably not at all how it would have been, but in my mind it was “okay let's go and live on our block in a caravan and that will feel safe” for some strange reason.

Those who left recognized the community-wide impact of the decision to relocate and often felt guilty about not supporting the community recovery. Some of those who stayed reported feeling abandoned by the departure of close neighbors and friends, reducing their local community social networks:

We've had a couple of close friends from here now leave that we didn't know before the fires but we've just got so close to them after the fires in some of the projects I was involved with. When they leave it actually hurts. I know we've not lost them forever and I'll still catch up with them and they come back and we visit each other and all the rest, but . . .

Oh, I feel so guilty for leaving them. Yeah. We try to catch up. It's just hard. It's not the same. And there's this big, windy road to go up and down.

There's this whole thing about people that aren't there permanently or people that have moved and aren't living there, have abandoned everybody. Oh there is. There really is. And talking to people that have decided to not go back, there's a lot of negativity about us abandoning our communities and a lot of us have felt that. Some have copped more stick than others. . . .

This also reflects the complexity of community connection, as some of those who stayed because of a commitment to place described a lost sense of community:

It's like the place that I knew exists only as a legend, as a mythical place and that this place is so different. . . . So you absent yourself because the pain of watching things get done to people and to groups and to the community irrespective of whether it's what's needed or not is too much to bear. . . .

The majority of interview participants had experienced temporary displacement after the fires because of property damage or loss. Participants' memories of this time were often hazy because of the stress and high demands of the period. Although there were some negative experiences with some accommodation options and others did not meet family needs, there were many accounts of people being grateful for what was

available until they were able to establish themselves again. Those who planned to return to their community appreciated opportunities to return for community events to reconnect. Temporary displacement commonly involved several changes in accommodation, often because of the competing needs of family members in accessing work, school, and their bushfire-affected property, meaning that some families were separated during the displacement period. Many also reported feeling unsettled and losing connection to place:

I guess one thing about the fires is I don't plan too much ahead now. The problem is I don't think I'm going to be here. . . . Things change. I don't think we'll ever be in one place for twenty years kind of thing, not now anyway.

Some participants reported feeling torn between the community to which they had relocated and their original, bushfire-affected community:

Losing a community and not really getting them back, that whole messy feeling of kind of wanting it back, it's never going to be the same. When you go up there, there's a horrible twisted pulling thing of feeling like you're home but not fitting in and it's not home.

Others had a dual sense of connection that was more positive:

I still talk about it as home but I talk about this as home too. . . . And it is weird to feel at home in more than one place but that's all okay. There's no right or wrong.

All the interview participants who had relocated had carefully weighed their options and made a considered decision to move after the disaster. They may therefore have been more positive about their relocation experience than people who might have experienced less choice in the matter. Those we interviewed experienced relocation as a positive move away from the impact of the disaster and the associated environmental and social negativity, to a new community that matched their needs as a family. Participants described how they had created their own space at their new homes and had developed social networks in their new communities, making the most of new opportunities, activities, and easier access to services and facilities.

The qualitative findings highlighted the opportunity to use the *Beyond Bushfires* survey data to quantify the relationships between relocation, personal wellbeing, psychological sense of community, and other related factors.

### **The *Beyond Bushfires* survey**

The *Beyond Bushfires* survey participants included 1,016 adults (612 females, 404 males) living in the selected communities, representing 16 percent of those eligible. Relative to census data, the sample was disproportionately older, female, and more educated than the general population, which is not unusual in research samples. For further information regarding the characteristics of this sample as a whole, including rates of mental health conditions, see Bryant et al.<sup>33</sup> Six participants were excluded from these analyses due to missing data on exogenous variables within the structural equation modeling (SEM). The final sample for analysis included 1,010 individuals:

897 (88.8 percent) who remained within their community (530 female, 367 male), and 113 (11.2 percent) who left the community (78 female, 35 male). Average age at the time of the bushfires was 53.1 years (56.5 at time of survey), and 350 (34.7 percent) respondents had a tertiary-level education.

### **Survey questions**

Baseline survey data collection took place both online and by telephone, with piloting in late 2011 and data collection for the main study occurring three to four years after the fires from April 2012 to January 2013. The survey included various questions addressing fire exposure, mental health, social networks, resilience, attachment, general health, wellbeing, community hope, and demographics. The items specific to this case study are described below.

#### ***Bushfire exposure***

Exposure variables included property loss, fear for one's own life, loss of friends and loved ones, and community-level impacts. Participants rated the extent to which they lost personal or business property or possessions, using a scale from 0 (Nothing) to 10 (Everything). Fear for one's own life and the death of a loved one were each measured through dichotomous yes-no questions. Regional impact (high, medium, and low impacts), as described above, was also used in measuring exposure.

#### ***Financial and relationship stressors***

Participants were presented with a series of potential major life events and asked which they had experienced since February 2009. The current analysis includes negative financial events (changes in income, employment status, and occupation), negative changes in relationship status, and any experience of violence or assault.

#### ***Psychological sense of community***

Participants' overall cognitive, affective, and behavioral involvement in their current community was measured by means of a six-item scale adapted from Buckner's neighborhood cohesion index (see Appendix 1).<sup>34</sup> Participants indicated their level of agreement using a five-point Likert-type scale (strongly agree/disagree). Internal reliability for the scale was excellent (six items,  $\alpha = .81$ ). Additionally, to assess whether current levels of psychological sense of community were associated with past levels, participants were asked the degree to which they felt they belonged to the community they lived in during January 2009, using a five-point Likert-type scale (strongly agree/disagree).

#### ***Personal wellbeing***

Wellbeing was defined in terms of life satisfaction (current and anticipated), personal resilience, and subjective overall health rating. The life satisfaction measure was derived from Cummins et al.,<sup>35</sup> overall current life satisfaction was ascertained by asking participants the degree to which they felt satisfied with life as a whole; anticipated

life satisfaction (optimism) was measured by asking for participants' expected level of life satisfaction in a year's time. Both questions were scored on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). Resilience was measured through two items taken from the Connor Davidson resilience scale (CD-RISC; see Appendix)<sup>36</sup> using a five-point Likert-type scale ranging from 1 (not at all true) to 5 (true nearly all of the time), and averaged. Finally, participants rated health overall (five-point scale – Poor/Excellent).<sup>37</sup>

### Statistical analysis of survey data

This statistical analysis aimed to assess the impact of bushfire exposure on wellbeing. We developed a theoretical model proposing how wellbeing is mediated by subsequent major life stressors and psychological sense of community, comparing those who remained in the community and those who relocated (see Figure 20.1). The theoretical modeling was informed by the interview findings and previous data analyses.<sup>38</sup> Our model proposed that disaster exposure itself not only affects subjective wellbeing directly, but also precipitates subsequent stressful circumstances in the following months and years, which have an additional negative effect on wellbeing. We hypothesized that the psychological sense of community is impacted by a disaster experience. However, as highlighted above, for any single individual, this relationship could reasonably be either positive or negative. Nonetheless, we (weakly) hypothesized that across the sample as a whole, there will be a positive association, with the disaster experience leading to increased sense of community, presumably through the mobilization of social support<sup>39</sup> and a heightened sense of common fate.<sup>40</sup> At the same time, however, the psychological sense of community will itself be diminished by the experience of negative subsequent events that hinder the individual's ability to participate in local community life. In turn, this sense of community is closely tied to wellbeing. Centrally, we consider the role of relocation as a response to the stress of the disaster event and subsequent stressors, which may come with trade-offs in terms of the support and experience of community. In particular, relocation may attenuate the negative influence that disaster

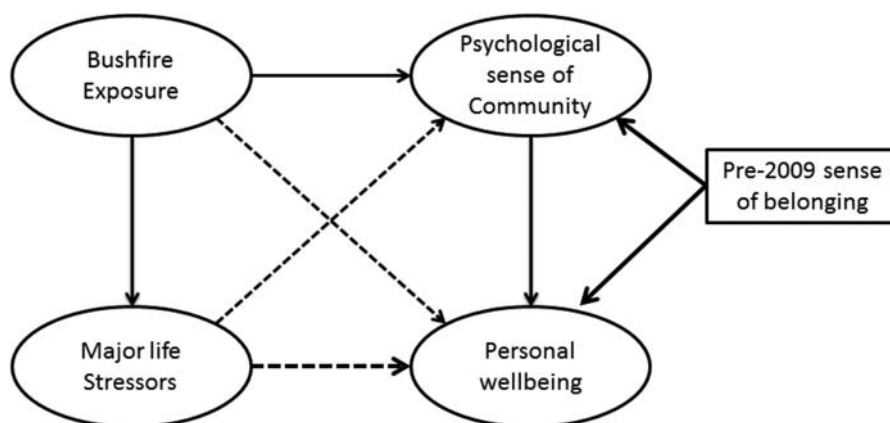


Figure 20.1 Theoretical model.

Solid lines represent positive relationships; dashed lines represent negative relationships.



exposure has on personal wellbeing, but at the same time may lessen a protective influence provided through one's sense of community. The resulting theoretical model to be tested is shown in Figure 20.1. The components of the model include a direct effect of bushfire exposure on personal wellbeing; indirect effects from exposure to wellbeing, as mediated by psychological sense of community and financial/relationship life stressors, respectively; and a direct effect of life stressors on the psychological sense of community. Education level and age were entered as control variables for wellbeing, major life stressors, and the psychological sense of community.<sup>41</sup> Sex was not found to be a significant predictor and so was dropped from the analyses.

The statistical analyses were conducted with SEM using Mplus version 7.3.<sup>42</sup> Through SEM, one can specify a structural model comprising several variables, inter-linked through hypothesized/assumed causal paths, with the aim of defining and testing the model which best explains the relationships among these variables. As with all cross-sectional research, SEM cannot determine causality. Instead, causal assumptions are based on an explicit theoretical framework and other strong assumptions made by the researcher and informed by earlier findings. In the current analysis, these variables are bushfire exposure, financial and relationship life stressors, the psychological sense of community, and personal wellbeing. As can be seen in the model (Figure 20.1), a one-way arrow denotes a direct predictive relationship between an independent variable and a dependent variable. Relationships between any two variables can be direct, or indirect as mediated by a third variable.<sup>43</sup>

Given that the data were collected using ordinal scales or dichotomous (yes/no) response formats, Weighted Least Squares Mean Variance (WLSMV) estimation with delta parameterization was used. This method of estimation does not carry assumptions of normality, and is considered the default choice for SEM with ordered categorical data.<sup>44</sup>

Following estimation, the model was assessed to determine whether it was an adequate fit for the data, as ascertained through the calculation of various model fit indices.<sup>45</sup>

## Survey findings

### *Participant characteristics*

Chi-square tests revealed that the sample as a whole was disproportionately female,  $\chi^2(1, 1010) = 42.02, p < .001$ . Comparisons between those who stayed in the community and those who relocated in terms of demographic variables and indicators or bushfire exposure are presented in Table 20.1. These revealed significant differences between the two sub-groups in terms of gender representation. Furthermore, the two sub-groups differed in terms of fear for one's life and property loss, with relocated individuals reporting higher levels of both. Those who relocated also reported lower levels of psychological sense of community (in relation to their current community). Nevertheless, in terms of wellbeing measures, those relocated were only slightly less satisfied with life currently, with no significant differences in terms of optimism, resilience, or subjective self-ratings of health.

### *The statistical model*

The primary aim of the statistical analyses was to see if relocation is a *moderator* of the relationships displayed in the hypothesized model. A moderator is defined as any

Table 20.1 Participant characteristics, by community relocation status

	Community-staying ( <i>n</i> = 897)	Community-relocated ( <i>n</i> = 113)	
	N (% of sub-group)		$\chi^2$ (1, 1010)
Sex (Female)	530 (59.1%)	78 (68.0%)	4.14*
Tertiary education	302 (33.7%)	48 (39.2%)	3.44
Fear for life	420 (47.8%)	65 (58.6%)	4.58*
Loss of someone close	254 (28.6%)	40 (35.7%)	2.42
	M (SD)		<i>T-test/Spearman's rho</i>
Age	53.3(12.9)	51.4(15.4)	<i>t</i> (132.7) = 1.46ns
Property loss	4.1(3.9)	7.1(3.9)	$r_s = .23^{***}$
Psychological Sense of Community	3.1(.68)	2.6(.94)	<i>t</i> (127.2) = 5.71***
Financial/relationship stressors	.96(1.1)	1.24(1.41)	$r_s = .05$
Current life satisfaction	7.0(2.4)	6.2(2.5)	$r_s = -.11^{***}$
Optimism (anticipated satisfaction)	7.9(2.1)	7.6(1.8)	$r_s = -.06$
Resilience	4.3(.82)	4.2(.86)	$r_s = -.02$
Subject health rating	2.2(1.1)	2.2(1.1)	$r_s = .002$

\*\*\**p* < .001, \*\**p* < .01, \**p* < .05; Spearman's rank correlation used instead of *t*-test for non-continuous data (staying = 0, relocation = 1).

variable that alters the strength or direction of the link between two other variables in the model.<sup>46</sup> In this study, the statistical analyses for detecting moderation effects were three-fold. First, an overall test was necessary to determine whether the hypothesized model held up as an adequate fit for the actual data as a whole. If so, the second step was to test the model independently on the sub-group of relocated individuals and the sub-group of those who stayed in the community, respectively, in order to gain an idea of how the model may differ between sub-groups. A final series of tests was then carried out to determine formally how the model was the same and how it was different, between the two sub-groups. Accordingly, for the first step, the model was first applied to the entire sample, irrespective of sub-group. Various model fit indices suggested an excellent overall fit (Table 20.2). All paths specified in the overall model were significant, with the notable exception of the direct paths from bushfire exposure to wellbeing ( $\beta = .05$ ,  $p = .52$ ) and from bushfire exposure to psychological sense of community ( $\beta = .08$ ,  $p = .20$ ).

Next, the overall model was applied independently to each group. The model was found to be an excellent fit when applied to either the community-staying sub-group or the community-relocating sub-group (Table 20.2). Nevertheless, comparing the two models side by side revealed various apparent differences between the two groups in terms of the strengths of path coefficients, to be tested through multigroup analyses.

### *Differences between groups: Moderation effects*

Given these apparent differences in the model between the two sub-groups, it was necessary to determine how this model was similar and how it differed between those who stayed in the community and those who relocated. A final series of

Table 20.2 Model fit and tests of moderation (invariance)

<i>Model description</i>	$\chi^2$	<i>Df</i>	<i>CFI</i>	<i>NNFI</i>	<i>RMSEA (90%CI)</i>	<i>Model comparison</i>	$\Delta \chi^2$	$\Delta df$	<i>Signif. level</i>
Basic model, complete sample	689.94	387	.967	.968	.039 (.035-.044)				
Basic model, staying sub-group (n = 897)	489.45	156	.964	.957	.049 (.044-.054)				
Basic model, relocated sub-group (n = 113)	196.46	156	.962	.954	.048 (.022-.068)				
<i>Multigroup analysis</i>									
1 Configural model (All parameters free between sub-groups)	661.20	360	.967	.966	.041 (.036-.046)				
2 Equal factor loadings, equal thresholds (Scalar invariance)	663.65	373	.968	.968	.039 (.034-.044)	2-1	11.19	13	.595
3a Equal loadings, Stressors → Wellbeing constrained	667.99	374	.968	.968	.039 (.035-.044)	3a-2	6.05	1	.014
3b Equal loadings, PSC → Pre-2009 Belonging constrained	690.78	374	.965	.965	.041 (.036-.046)	3b-2	24.86	1	<.001
3c Equal loadings, Exposure → Wellbeing constrained	667.92	374	.968	.968	.039 (.035-.044)	3c-2	4.59	1	.032
3d Equal loadings, PSC → Wellbeing constrained	667.48	374	.968	.968	.039 (.035-.044)	3d-2	3.93	1	.048
4 Equal loadings, all paths constrained	689.94	387	.967	.968	.039 (.035-.044)	4-2	36.74	14	<.001
5 Equal loadings, moderated paths unconstrained (3a-3d), all other paths constrained (Figure 20.2)	650.63	383	.971	.971	.037 (.032-.042)	5-2	9.19	10	.514

All  $\chi^2$  significant at p <.05 level or more.

steps were conducted to determine whether these differences were statistically significant and which would establish relocation as a moderator of effects between disaster exposure and personal wellbeing.<sup>47</sup> To do so, we followed a general multigroup approach (outlined in detail elsewhere).<sup>48</sup> In brief, the multigroup analysis in Table 20.4 depicts a series of hierarchically ordered steps by which the statistical model was successively merged (made the same) across groups in terms of various statistical parameters (i.e., factor loadings, item thresholds, error terms, etc.). Each model was tested against the preceding model to see if the fit for the model deteriorated significantly. If not, the succeeding model was accepted as a more parsimonious representation of the data.

In particular, Model 2 shows that the data were *scalar invariant*, meaning that the theoretical constructs were adequately equivalent so that it was possible to make the hypothesized statistical comparisons between relocated and non-relocated individuals (i.e., moderation effects). Next, possible moderation effects were tested for four of the paths (as identified by Wald tests): the paths from exposure to wellbeing, from life stressors to wellbeing, from psychological sense of community to wellbeing, and from past sense of belonging to psychological sense of community. In order to test each, four separate models were tested in which the (potentially moderated) path was held constant in order to determine whether the model fit significantly differed (Table 20.2, Models 3a–3d). Models 3a–3d were explicit tests of the moderation effects, showing that the strength of these paths differ significantly between groups. A final model (Model 5) was tested which treats the two sub-groups in exactly the same way, except for the four moderated paths. This final model is depicted in Figure 20.2.

#### *Lasting impact of bushfire exposure: Direct versus indirect effects*

As seen above, one apparent difference in the model is that while the effect of disaster exposure on wellbeing was direct among relocated individuals, it was indirect among those who stayed, as mediated by financial and relationship stressors. Accordingly, it was appropriate to conduct an analysis of moderated mediation in order to confirm that this apparent difference was statistically significant.<sup>49</sup> Applied to the equal loading model, these analyses confirmed that among those who stayed in the community, there was a significant negative indirect effect of disaster exposure on personal wellbeing, as mediated by financial/relationships stressors ( $\beta = -0.45$ ,  $p = .001$ ). By contrast, among those who relocated, this indirect effect was not significant ( $\beta = -0.07$ ,  $p = .578$ ). A Wald test indicated that the difference between these (unstandardized) indirect effects was significant ( $\theta = -0.424$ ,  $p = .041$ ).<sup>50</sup> Overall, this analysis confirms that the impact of disaster exposure was direct among those who relocated and indirect among those who stayed (mediated by life stressors), and that the difference between the two was itself statistically significant. In other words, subjective wellbeing among the relocated was a direct outcome of bushfire exposure. This is in contrast to those who stayed in the community, for whom wellbeing was a result of the subsequent major life stressors which exposure had precipitated.

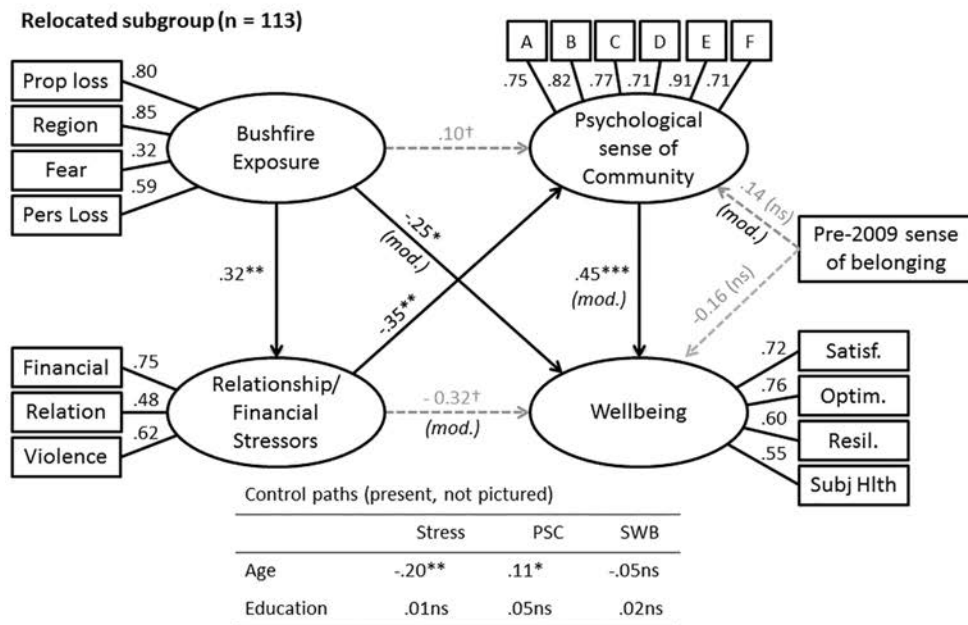
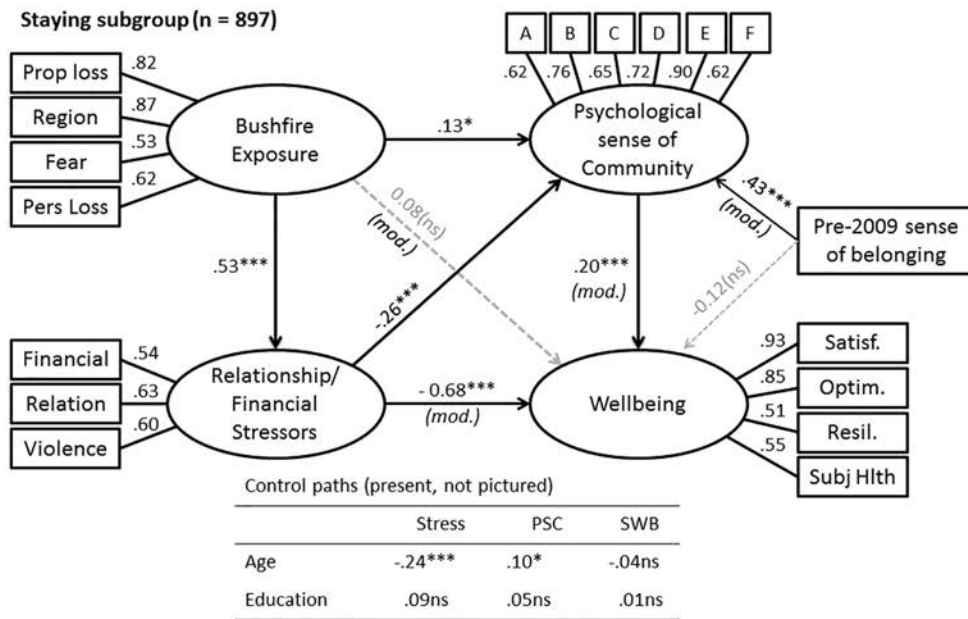


Figure 20.2 Final model: testing similarities and differences between sub-groups.

Parameters are standardized ( $\beta$ ). \*\*\* $p < .001$ ; \*\* $p \leq .01$ , \* $P < .05$  † $p < .10$ . All factor loadings significant at  $p < .001$ . Significant moderation paths are indicated (mod.).

## Discussion

This case study shows clear relationships between sense of community, relocation, and personal wellbeing. Using mixed methods provided an opportunity to develop a comprehensive understanding of the nature and extent of those relationships.

The findings from the in-depth interviews in the *Beyond Bushfires* study identified the impact of the bushfire experience on the sense of community and how this influenced subsequent decisions regarding whether to remain in the affected community or to relocate. It also provided insight into the individual and community-level impacts of those decisions. These findings informed the development of a theoretical model for statistical analyses of the survey data. The results from the analyses largely supported the theoretical model, albeit with important differences between staying and relocating sub-groups. Overall, personal wellbeing was adversely predicted by negative life events, be that the disaster experience itself, or the negative events that followed. However, statistical analyses showed important differences between those who remained in the community versus those who relocated, revealing two broad effects concerning the ways in which disaster exposure affects current subjective wellbeing.

For those who relocated, current wellbeing was more strongly tied to disaster exposure itself, rather than subsequent life stressors. Conversely, for those who remained within their community, wellbeing was tied more distinctly to subsequent negative life events, over and above initial fire exposure. This is supported by the interview data, which revealed that the post-disaster community environment was often the motivation for leaving and that, for those interviewed, relocation was generally experienced as positive in terms of reducing exposure to repeated negative visual and social bushfire related encounters. It may also have been a means of restoring ontological security by moving to a community with more stability.<sup>51</sup> Thus, while there is no evidence to suggest that those who relocated experienced more or fewer financial and/or relationship stressors (both have been reported in other studies of families who have relocated post-disaster),<sup>52</sup> their relocation may have effectively dealt with or circumvented the impact of these stressors. It may also reflect a difference between the uncertain costs of rebuilding versus known costs of renting/buying an existing home in a new location. Regardless, despite this apparent circumvention, the disaster exposure itself has a lingering effect for those who relocate, independent of subsequent negative events, which is greater than for those who stayed. Interview findings suggest that this may arise due to fewer opportunities for those who relocate for shared processing of the disaster experience and less access to recovery services.<sup>53</sup>

The second pattern concerns the sense of community and its influence on wellbeing. As theorized, a significant relationship from bushfire exposure to sense of community exists among those who stayed in the community, with increased exposure associated with increased sense of community. As initially hypothesized, those who were most impacted may have been primed to think in terms of their need for community and the common fate they share with their neighbors. The interview findings indicated a strong sense of community among those who stayed, enhanced by the shared disaster experience, consistent with studies of wildfires in British Columbia, and Canada, and New Orleans following Hurricane Katrina.<sup>54</sup>

Furthermore, while current psychological sense of community was a significant predictor of wellbeing for both sub-groups, it bore a significantly *stronger* impact on wellbeing among the relocated sub-group. Interview findings suggested that people

appreciated the positive physical and social environment of their new communities and were actively seeking opportunities to become involved, consistent with reports of families' experiences of relocation post-Hurricane Katrina.<sup>55</sup> In addition, the interview findings indicated that it is not individual bushfire exposure that influences sense of community but rather the individual experiences of the post-disaster community. For some, sense of community is enhanced by the shared experience of the disaster and the rebuilding processes. For others, it is lost through the damage, disruption, and disharmony.<sup>56</sup>

Altogether, the model indicates a counterbalancing effect of relocation. Much of the model appears to suggest that those who relocate are at greater risk for reduced wellbeing due to a stronger (direct) link with initial disaster exposure. Furthermore, the wellbeing of those who relocate is more strongly intertwined with their current sense of community, shown to be reduced for those who have relocated (see Table 20.1). These heightened risk factors are at least partially offset, however, by the moderating influence of a reduced impact of life stressors. Leaving the community therefore appears to mitigate or interrupt the effect that subsequent stressful life events have on personal wellbeing, to the point where relocated individuals report similar levels of subjective wellbeing to those who stayed (see Table 20.1).

Finally, we see that among those who stayed in their community, current sense of community is associated with recollections of community belonging pre-2009. By contrast, perhaps unsurprisingly, among those who relocated there is no association between current sense of community and sense of belonging to their prior community, indicating that a psychological sense of community is not a constant, behavioral, or personality attribute. Rather, it suggests that one's emotional and behavioral attachments to place are linked keenly to a particular community.<sup>57</sup> Re-establishing oneself elsewhere is likely to be a demanding process that needs careful consideration, but in the interviews it appeared to be embraced by those who decided to leave the challenging environment of a disaster-affected community.

This case study highlights different recovery service needs for those who stayed in their community and those who relocated. Those who stay may benefit from an increased focus on alleviating the subsequent financial and relationship stressors occurring post-disaster. On the other hand, services that support a recovery from the disaster event itself need to be more accessible to those who have relocated. In order to achieve this it would be helpful to establish a register of those who relocate to assist in geographical planning for service delivery. Finally, information about the impacts of staying or relocating on personal wellbeing needs to be made available in disaster-impacted communities to support individuals and families in making informed decisions about whether to stay or to relocate and how to maximise the positives and minimise the potential risks of that decision. There may also be service implications in addressing the disappointment felt by friends and neighbors left behind and the guilt of those who leave.

### **Limitations**

There are a number of limitations to be considered when interpreting the case study findings. First, as in any study, there are limitations in terms of the measures. In particular, the current model lacks an indicator as to when an individual left the community. There may yet be important differences between those who relocated immediately and

those who remained for a longer period before relocating. Furthermore, the Buckner scale was originally developed for use at the community level as an aggregate measure of social cohesion. In this study, selected items from the scale were used at an individual level to measure the sense of community. Other measures of individuals' psychological sense of community elucidating the various behavioral, cognitive, and affective dimensions of the sense of community could usefully give a more precise picture of the effect of disaster exposure and relocation.

Second, integrating the survey and interview findings contributes to increased understanding of relocation experiences; however, these should be treated with caution due to the different time periods over which the data were collected.

Third, we could not randomize people to relocating or remaining in the community. As noted, relocating following disaster is influenced by a range of environmental and personal factors, difficult to accommodate into the modeling of psychological outcomes. It is also possible that those who participated in the study had a stronger sense of community than those who did not, thus limiting the generalizability of these findings to the population as a whole and to other contexts.

## Conclusion

Decision-making about whether to stay or to relocate from disaster-affected communities is complex and challenging, and, although experienced by individuals and families, has community-wide impacts. This Australian bushfire case study demonstrates the importance of the psychological sense of community in both decision-making and the experience of relocating. For those who feel a strong attachment to their current community, a decision to stay is likely to be most supportive of personal wellbeing. For those whose sense of community has been disrupted by a disaster impact, relocating is likely to reduce the influence of subsequent financial and relationship stressors on personal wellbeing, but will still require them to build social connections with their new community. This has implications in terms of targeted service provision following bushfires to support informed decision-making about relocation; to assist those who stay in their community to deal with financial and relationship stressors; and to increase access to appropriate disaster recovery services for those who have relocated.

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# Appendix A

## Measures of the psychological sense of community

### *Selected Items from Buckner's (1988) Neighborhood Cohesion Instrument*

- 1 I plan to remain a resident of this community for a number of years
- 2 I regularly stop and talk with people in my community
- 3 I think I agree with most people in my community about what is important in life
- 4 I would be willing to work together with others on something to improve my community
- 5 I feel like I belong to this community
- 6 I am very attached to the local environment and landscape

### Connor-Davidson Resilience Scale (selected items)

- 1 I am able to adapt to change”
- 2 I tend to bounce back after illness or hardship.

### Pre-2009 community belonging

I felt like I belonged to this community (January 2009).

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