

# Investigating the relationship between resilience and post traumatic stress disorder in adults exposed to a natural disaster as children: A 20-year longitudinal follow-up

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## Introduction

On the 16<sup>th</sup> of February in 1983, the Ash Wednesday bushfires devastated a number of small communities in South Eastern Australia. Notable studies have examined the unique trajectory of adverse outcomes that can arise following early exposure to significant trauma, such as natural disasters (McFarlane & Van Hooff, 2009; Najarian, Sunday, Ladruna & Barry, 2011; Galletly, Van Hooff & McFarlane, 2011). However, few studies have investigated the factors that contribute to long-term resilience to adverse outcomes.

The issue of why some people do not develop adverse psychiatric outcomes despite exposure to the same significant trauma, is an emerging area of research (Bonanno, 2004; Aciermo, Ruggiero, Kilpatrick, Resnick & Galea, 2006; Kilmer & Gil-Rivas, 2010). Are there inherent protective or resilience factors that exist in certain individuals? Alternatively, can long-term resilience be explained by posttraumatic growth, an adaptive positive response to the trauma itself?

A recent study (Bonanno, 2004) has defined adult resilience as follows:

“The ability of adults in otherwise normal circumstances who are exposed to an isolated and potentially highly disruptive event such as the death of a close relation or a violent or life-threatening situation to maintain relatively stable, healthy levels of psychological and physical functioning” (pp. 20-21)

In this way, resilience is not necessarily the *presence* of a set of measurable ‘resilience’ characteristics, but rather the *absence* of measureable and well accepted adverse reactions such as DSM-IV diagnoses. The current study conceptualises resilience in accordance with Bonanno’s clear definition above.

Previous studies have looked at the predictive role of factors such as demographics, additional life stressors, and family functioning in relation to resilience following traumatic experience (Hafstad, Gil-Rivas, Kilmer & Raeder, 2010; Bonanno, Galea, Bucciarelli & Vlahov, 2007; McDermott, Cobham, Berry & Stallman, 2010). Rumination (Kilmer & Gil-Rivas, 2010), parental psychopathology (Jaffee, Caspi, Moffitt, Polo-Tomas & Taylor, 2007), additional lifetime trauma, and having a supportive partner (DuMont, Widom & Czaja, 2007) increased the likelihood of resilience.

This study will explore the factors associated with long-term resilience following trauma exposure during childhood. This study will have a specific focus on demographic variables, self belief, world views, family functioning including parental factors as well as other lifetime trauma as hypothesised predictors of resilience. Given that this study involves a matched control group recruited at the time of the original 1983 study, it is in the unique position to begin to examine the additional impact of childhood natural disaster exposure, and thereby shed light on this fascinating and emerging debate over the factors relating and leading to resilience.

## Method

A total of 1011 adults who were recruited as children following the 1983 Ash Wednesday Bushfire in South Australia took part in this 20-year follow-up. This study uses a repeated-measures between-groups (bushfire/control and interpersonal trauma/non-interpersonal trauma) design to determine the effect of exposure to childhood trauma on adult resilience.

Measures:

- One hour structured telephone interview using the Composite International Diagnostic Interview (CIDI-Auto, version 2.1) (World Health Organisation, 1997).
- World Assumption Scale
- Demographic information, family functioning and social support were measured with a self report questionnaire.

Resilience has been operationally defined as an absence of lifetime Post Traumatic Stress Disorder (PTSD).

## Results

Demographics: Participants in the bushfire group were significantly more likely to have children, to live in rural settings, and to be employed as a professional or manager than control participants, but significantly less likely to attain tertiary education. The mean age of the bushfire group was 28.7 years, and the mean age of the control group was 27.8 years.

Excluding the bushfire, there were no significant differences in the number of lifetime traumatic events between the bushfire and the control group. The frequencies are shown in table 1.

Table 1.

	Bushfire Group N(%)	Control Group N(%)
No lifetime trauma	180 (33.3)	168 (35.7)
Lifetime trauma	360 (66.7)	303 (64.3)
TOTAL	540	471

Similarly, there were no significant differences in lifetime PTSD prevalence between the two groups. Prevalence rates are in table 2.

Table 2.

	Bushfire Group N(%)	Control Group N(%)
Lifetime PTSD	41 (7.6)	27 (5.7)
Resilient	487 (90.2)	437 (92.8)
TOTAL	528	464

However, rates of interpersonal trauma were higher in the bushfire group when compared to the controls  $\chi^2(1, n=1011) = 9.21, p < 0.005, \phi = -0.095$ . See table 3.

Table 3.

	Bushfire Group N(%)	Control Group N(%)
Interpersonal trauma	223 (41.3)	151 (32.1)
Non-interpersonal trauma	317 (58.7)	320 (67.9)
TOTAL	540	471

Table 4 illustrates that individuals who experienced interpersonal trauma had significantly higher rates of lifetime PTSD  $\chi^2(1, n=992) = 46.72, p < 0.001, \phi = 0.217$ .

Table 4.

	Interpersonal Trauma N(%)	Non-interpersonal Trauma N(%)
Lifetime PTSD	52 (13.9)	16 (2.6)
Resilient	322 (86.1)	602 (96.8)
TOTAL	374	618

Based on these results, the ability of demographic factors, parental factors, and beliefs about self and world to predict resilience following interpersonal trauma was examined.

Demographic characteristics including employment status, level of qualification, marital status or level of income were not significantly related to resilience in either the interpersonal trauma or the non-interpersonal trauma group. Some parental factors were found to be significantly related to resilience in adulthood for both interpersonal and non-interpersonal trauma. Cognitive factors were also significantly related to resilience. Discriminant function analysis revealed that the factors related to resilience were different between the interpersonal trauma and non-interpersonal trauma groups. The following correlation coefficients indicate a medium effect size.

Table 5.

	Interpersonal Trauma	Non-Interpersonal Trauma
Indifferent Mother	0.591	Overprotective Mother 0.481
Abusive Mother	0.573	Self belief "No Good" 0.416
Overprotective Mother	0.535	Ashamed of self 0.397
Abusive Father	0.454	Abusive Mother 0.311
Low opinion of self	0.375	Self belief "Life is a gamble" 0.305

## Discussion

This study is a 20-year follow-up of a cohort of children exposed to the Ash Wednesday Bushfires with a specific focus on the relationship between resilience and PTSD. Initial analysis indicated that the Bushfire exposed group did not experience significantly different amounts of additional lifetime trauma, excluding the bushfire, in comparison to the non-exposed control group. Furthermore, rates of PTSD between these groups were not significantly different. Given that lifetime PTSD diagnosis was measured, this result is not necessarily surprising, and indicates that over time, both the bushfire group and control group may respond to multiple traumas similarly. As reported by McFarlane & Van Hooff (2009) multiple traumas were more likely to result in PTSD, particularly in the case of the Bushfire group. This raises the important question of what role trauma type plays in the development of PTSD or resilience.

As the results show, the factors relating to resilience in the interpersonal trauma group are notably different from the non-interpersonal trauma group. The findings indicate a greater number of externally driven factors providing a resilient foundation for individuals exposed to interpersonal trauma. This is in contrast to the non-

interpersonal trauma exposed group where a higher proportion of internally, self-belief driven factors was more closely related to resilience. It may be the case that the nature of interpersonal trauma may have a lasting effect on these self-belief and world-view factors which potentially disable the ability to promote an intrinsic resilient response across the long term. This is important for many reasons. In order to promote a resilient response, particularly following large scale trauma exposure such as natural disaster, it is important to know how these factors impact resilience, and where differences might be important.

It is important to note that the factors most strongly related to the lack of long-term psychopathology, conceptualised here as resilience, are all *negative* environmental and cognitive factors, rather than positive factors. Our exploration of positive cognitive factors that have traditionally been associated with individual resilience simply are not significant predictors of long term health and wellbeing. These findings have important implications in terms of the viability of the construct of resilience based on the world assumptions. This highlights the importance of empirical data that validates the construct of resilience based on positive predictors of health.

Whilst this study uncovered predictors of resilience across different trauma types, it is restricted in the range of variables considered, given the limited scope. It should be the goal of future research to fully examine predictors of resilience, without limiting the analysis to the presence or absence of PTSD, by including other DSM-IV disorders such as affective, anxiety disorders and alcohol use disorders. In this way, a more complete picture of the effects of trauma exposure, and the predictors of a resilient trajectory can be uncovered.

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