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Short communication

Crushing hope: Short term responses to tragedy vary by hopefulness

Jason Fletcher

La Follette School of Public Affairs, Department of Sociology, Center for Demography and Ecology, University of Wisconsin-Madison, United States

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ABSTRACT

This paper explores the consequences of hopefulness when the environment changes. Much literature has documented the importance of a positive outlook in pursuing investments in health and education that pay off in the future. A question that has received less attention is whether a positive outlook creates resilience in the face of setbacks or whether a positive outlook may be a disadvantage in extreme circumstances, especially when there is a large mismatch between expectations and reality. This paper uses the coincidental interview schedule of the Add Health data (N = 15,024) around the terrorist attack of September 11, 2001 to examine interactions with this environmental shock and previously elicited measures of hopefulness. The results suggest that increases in depressive symptoms following the attack are concentrated among those young adults who initially expressed the most hopefulness in the future as teenagers.

1. Introduction

Large literature across the psychological and social sciences have focused on understanding social and psychological processes underlying resilience to stressful and traumatic events, where resiliency is conceptualized in the literature as "the human capacity to face, overcome, and even be strengthened by the adversities of life" (Grotberg, 1995). A key hypothesized determinant of resilience is expectations about the future. In particular, people who are measured to be have high dispositional optimistism, typically report lower distress after encountering a broad range of stressful situations (Andersson, 1996; see Nes and Segerstrom 2006 for review and meta analyses). A primary hypothesized mechanism is the set of coping strategies employed by individuals with higher dispositional optimism, where approach coping strategies that aim to eliminate and manage stressors are used rather than avoidance coping strategies that ignore, avoid, or withdraw from stressors.

An alternative set of findings have suggested that traits like dispositional optimism and their associated coping strategies are not good or bad predictors of resilience, *per se*, but rather the key determinant of resilience is whether individuals and their experiences and traits are matched or mismatched with the environmental stressors that they face (Nederhof et al., 2014). This latter theory, and associated evidence, builds off theories in evolutionary and developmental psychology suggesting that individuals' early environments "program" them in ways that will be beneficial in their expected environments as adults (Boyce and Ellis, 2005; Frankenhuis and Del Giudice 2012; Brody et al., 2013). In cases where the child and adult environments differ, adults can become mismatched with their environments. In particular, adults who develop dispositional optimism as children and adolescents due to living in a safe and secure early environment may be less able to cope with adult trauma than adults who developed lower levels of optimism.

In the present study, I tested the hypothesis that a measure of self-reported hopefulness in contexts of trauma lead to higher resilience to the formation of depressive symptoms. The alterative hypothesis is that individuals with high hopefulness will be less likely to cope with trauma due to a mismatch between their coping strategy and the level of stress in the environment and will therefore experience higher levels of depressive symptoms following a traumatic event. I test this hypothesis using a prospective, nationally representative sample using a "natural experiment" framework to support causal inference.

2. Method

2.1. Sample

Data came from the first and third waves of the National Longitudinal Study of Adolescent to Adult Health (Add Health) (Harris et al., 2009). Add Health is a prospective nationally representative sample of US students in grades 7–12 in 1994/5 who have been followed through 2008/9 in four waves of surveys to understand life course processes of health and socioeconomic attainment. Of the 20,745 respondents in Wave 1, 20,662 have a non-missing report for hopefulness, 15,123 were followed in the Wave 3 data collection, and 15,024 of those followed have outcome information available, which is the analysis sample.

2.2. Measures

2.2.1. Baseline emotions style

The first wave of the survey collected rich sociodemographic, health, and schooling information including a Center for Epidemiology

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Studies Depression (CES-D) screener (Garrison et al., 1991) that contained the question of whether the respondent "felt hopeful about the future" during the past week. Answer options include (never/rarely, sometimes, a lot of the time, and most/all of the time). This question is used to assign "hopefulness" at baseline. Other researchers have used Add Health data and questions about early mortality expectations as a measure of hope and found associations with financial and social capital (Bennett et al., 2014).

2.2.2. Exposure to a traumatic event

The Wave 3 data collection occurred over 2001–2002 and coincidently overlapped with the terrorist attacks on the United States on September 11, 2001. We use the date of the Wave 3 interview as our indicator of exposure to a traumatic event. Ford et al. (2003) and Fletcher (2014) used these data to show that being interviewed following the attacks resulted in elevated depressive symptoms compared to those interviewed prior to the attacks (see also Metcalfe et al., 2011 for evidence from the UK).

2.2.3. Depressive symptoms

A shortened, 9-item, CES-D screener was used at Wave 3. Each item was based on a question of "How often was each of the following things true during the past seven days?" and had available responses of: never/rarely, sometimes, a lot of the time, and most/all the time. The items included: you were bothered by things that usually don't bother you; you could not shake off the blues, even with help from your family and friends; you felt that you were just as good as other people (reserve coded); you had trouble keeping your mind on what you were doing; you were depressed; you were too tired to do things; you enjoyed life (reverse coded); you were sad; you felt that people disliked you. These items are summed to create a depression scale (0 points for never up to 3 points for most/all the time).

2.3. Statistical analysis

To examine whether individuals' elevated depressive symptoms following the terrorist attack on September 11, 2001 was conditional on baseline hopefulness, I compared the depressive symptoms of individuals who were interviewed before vs. after the attack and estimated differences in elevated symptoms conditional on Wave 1 hopefulness. I performed linear regression analysis with controls for sociodemographic characteristics and day of the interview to adjust for seasonal differences in depressive symptoms (Tefft, 2012). The key coefficient of interest was the interaction between baseline hopefulness and an indicator for being interviewed after 9/11. Additional analyses examine this interaction for each of the 9 items of the depression index separately. An important assumption of this analysis is that the "exposure" of being interviewed before vs. after 9/11 is uncorrelated with baseline hopefulness, which I test in supplemental tables (Table 5A). Additional supplemental files show that attrition at Wave 3 is not statistically related to hopefulness at baseline (Table 4A).

3. Results

Descriptive statistics of all variables used in the analysis are shown in Table 1. The average depression scale score at Wave 3 follow up is 4.64 (4.09 SD) in the sample. At baseline, 11% of the sample reported never/rarely feeling hopeful, 26% report sometimes, 34% report a lot, and 29% report most/always feeling hopeful. 78% of the sample were interviewed following the terrorist attack and are therefore the "treated" group. Sociodemographic and educational control variables include race/ethnicity, age, sex, family income during high school, maternal education level, the Peabody Picture Vocabulary Test (PVT), and indicator variables for missingness of these control variables. Appendix Table 1A stratifies the descriptive statistics based on Wave 1 hopefulness. Appendix Table 2A presents statistical associations between the sociodemographic controls and Wave 1 hopefulness using OLS regression analysis. Individuals with higher PVT scores and from more highly educated families have higher hopefulness. Black respondents (conditional on socioeconomic status) report higher hopefulness than whites; Hispanic and "other" race/ethnic groups report lower hopefulness than whites.

Table 1
Descriptive statistics add health analysis sample (N = 15,024).

Variable	Wave	Mean	Std. Dev	Min	Max
Depression Scale	3	4.64	4.09	0	26
Bothered by things	3	0.54	0.69	0	3
Could not shake off blues	3	0.34	0.66	0	3
Felt not as good	3	0.73	0.94	0	3
Distracted	3	0.62	0.75	0	3
Depressed	3	0.35	0.65	0	3
Too Tired	3	0.64	0.73	0	3
Did not enjoy life	3	0.65	0.83	0	3
Sad	3	0.51	0.68	0	3
People dislike you	3	0.27	0.56	0	3
Depression Scale	4	2.62	2.56	0	15
Time (days)	3	224.43	75.64	0	402
Indicator for Post 9/11	3	0.78	0.41	0	1
Black	All	0.22	0.41	0	1
Hispanic	All	0.16	0.37	0	1
Other Race	All	0.08	0.27	0	1
Male	All	0.47	0.50	0	1
Age	3	21.95	1.77	18	28
Family Income ($1,000s)	1	45.91	40.20	0	990
Maternal Education	1	13.21	2.27	0	17
PVT Score	1	100.51	14.07	13	146
Missing PVT	1	0.05	0.21	0	1
Missing Family Income	1	0.24	0.43	0	1
Missing Maternal Education	1	0.10	0.30	0	1
Missing State	1	0.00	0.07	0	1
Hopefulness	1	2.81	0.98	1	4
Never/Rarely Hopeful	1	0.11	0.32	0	1
Sometimes Hopeful	1	0.26	0.44	0	1
Hopeful A Lot of Time	1	0.34	0.47	0	1
Hopeful Most/All Time	1	0.29	0.45	0	1

Table 2 presents the main results predicting depression symptoms at Wave 3. The post 9/11 indicator coefficient suggests that individuals interviewed following the terrorist attacks of 9/11 had depressive symptoms that there 0.436 points higher (approximately 0.1 standard deviations) than those interviewed before the attacks. Baseline hopefulness also predicts depressive symptoms; those who reported being hopeful "most/all" the time have a 1 point lower depressive symptom score than those who reported "never/rarely" being hopeful at baseline (which is approximately six years prior to the depressive reports). The results also reproduce results from the literature, that racial/ethnic minorities report higher depressive symptoms, as do female respondents.

Column 2 of Table 2 focuses attention on the key coefficient of interest and shows an interaction between exposure to the traumatic experience and baseline hopefulness. Indeed, individuals with higher levels of baseline hopefulness are found to have an elevated response to the terror attacks compared to individuals with lower baseline hopefulness. Appendix Table 3A stratifies these analyses by baseline hopefulness, which further supports an elevated response to the terrorist attack for individuals with higher baseline hopefulness.

Table 3 further examines the elevated responsiveness to the terrorist attacks for individuals with higher baseline hopefulness by examining each of the 9 depressive symptoms, in separate analyses. Column 1 in Table 3 reproduces results from Table 2 for comparison. The results suggest no differences in four of the depressive symptoms, including being bothered by things, being districted, being sad, and thinking that people dislike you. In contrast, individuals with high baseline hopefulness have elevated responses for symptoms such as feeling not as good, not enjoying life, feeling too tired, and not being able to shake off