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Getting “Stuck” in the Past: Temporal Orientation and Coping With Trauma

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The relations between temporal orientation and long-term psychological distress were studied cross-sectionally and longitudinally in 3 samples of traumatized individuals: adult victims of childhood incest, Vietnam War veterans, and residents of 2 southern California communities devastated by fire. Results indicated that a past temporal orientation—focusing attention on prior life experiences—was associated with elevated levels of distress long after the trauma had passed, even when controlling for the degree of rumination reported. Temporal disintegration at the time of the trauma—whereby the present moment becomes isolated from the continuity of past and future time—was associated with a high degree of past temporal orientation over time and subsequent distress. Temporal disintegration was highest among individuals who had experienced the most severe loss, had previously experienced chronic trauma, and had had their identities threatened by their traumatic experience.

For ages, philosophers have discussed the nature of time and its role in the development of human consciousness, self, and identity (see Sherover, 1975, for a review). Over the last century, psychologists have participated in this dialogue and have suggested that perceptions of time are part of the foundation from which conscious thought and behavior emerge (James, 1890; Kelly, 1955; Lewin, 1942). As such, temporal perceptions have been considered the primary context through which humans understand and make sense of their life experiences (James, 1890; Kelly, 1955) and the cognitive organizer of human behavior (Fraisse, 1963; Zimbardo, 1994).

Although a number of approaches have been used in the definition and study of temporal perceptions (see Fraisse, 1984; Nuttin, 1985), two fundamental and related temporal constructs have received a great deal of attention. First, *temporal perspec-*

tive can be defined as the overall span of cognitive involvement across past, present, and future life domains (see Fraisse, 1963; Nuttin, 1985). Individuals can have a temporal perspective that ranges from extended (e.g., distant past through distant future) to narrowed (e.g., immediate past and present only). Second, *temporal orientation* refers to cognitive involvement focused predominantly on one of the three time zones (i.e., past, present, or future; see De Volder, 1979; Nuttin, 1985). Together, these related temporal perceptions create an overarching cognitive response bias that filters and interprets the meaning of personal experience. By sifting the ongoing stream of experience and awareness into past, present, and future domains, this cognitive bias is thought to exert a powerful influence on thought, feeling, and behavior (Zimbardo, 1994).

In keeping with the philosophical assertion that the future dominates human consciousness (Heidegger, 1962; Minkowski, 1970), psychologists have suggested that a future-oriented temporal perspective guides most psychological processes, and that future expectations play a critical role in maintaining mental health and well-being (Adler, 1925; Kelly, 1955; Lewin, 1942; May, 1958; McClelland, 1961; Melges, 1982; Nuttin, 1985). Without disputing the importance of maintaining a future-oriented perspective, some theorists simultaneously have emphasized the benefits of integrating past and present experience with future expectations in order to strengthen personal morale, enrich one's sense of self, and cope effectively with adversity (Erikson, 1959; Fraisse, 1963; Fraser, 1966; Kelly, 1955; Lewin, 1942; Melges, 1982).

Although there is some empirical evidence supporting these views, much of the work in this area has been unsystematic. For example, conceptual definitions and operational measures of temporal constructs have varied widely across many decades of research (see De Volder, 1979; Wallace & Rabin, 1960, for reviews). Nonetheless, prior research does suggest that temporal orientation is associated with academic achievement (e.g., Cottle, 1969; De Volder & Lens, 1982; Goldrich, 1967; Raynor, 1970), health behaviors (Rothspan & Read, 1996), and psycho-

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logical adjustment (Braley & Freed, 1971; Klineberg, 1967; Landau, 1976; Rappaport, Enrich, & Wilson, 1985; Rychlak, 1973; see also Albert, 1977; Melges, 1990). The pattern that has emerged from these diverse studies suggests that maintaining a future-oriented temporal perspective is most beneficial for overall mental health and well-being (Melges, 1982; Rothspan & Read, 1996). In addition, some studies have also suggested that orienting oneself toward any one time zone at the expense of the others may be detrimental. In particular, focusing predominantly on the past (and sometimes on the future) appears to have negative consequences for identity formation (Rappaport et al., 1985), satisfaction with self (Braley & Freed, 1971), and personal achievement (Goldrich, 1967).

Much of the aforementioned research has addressed the relations between temporal orientation and common daily experiences. However, there remains a paucity of information available about how temporal orientation operates when an individual has to cope with an event that is outside the range of his or her everyday experience (e.g., highly stressful or traumatic events). This remains true despite the fact that early theorizing about temporal orientation argued that maintaining an integrated temporal perspective is beneficial when coping with adversity (Lewin, 1942). Hence, two important questions remain unaddressed in the literature: (a) What is the relationship between temporal orientation and traumatic experience? and (b) How is temporal orientation related to the long-term impact of trauma on psychological well-being? Although neither of these questions has been addressed empirically, clinical observations of traumatized individuals and empirical studies of coping with negative life events may help clarify the relationships among trauma, temporal orientation, and long-term adaptation.

For example, Janet (1925) suggested that the initial emotional reaction to a traumatic event can be so intense as to have a disintegrating effect on the entire psychological system. He argued that by disrupting cognitive processing of the event, these initial reactions may interrupt personal development and leave individuals mentally "stuck" in their prior traumatic experience (see also van der Kolk & van der Hart, 1989). Stress and coping researchers have also proposed that stressful events may pose an immediate and profound challenge to the most fundamental beliefs people hold about themselves and their worlds (see Epstein, 1991; Janoff-Bulman, 1989, 1992; McCann & Pearlman, 1990). In coping with a stressful experience, people may try to assimilate the event by "working it through"; making sense of it; and integrating it into their core beliefs and assumptions about the self and the world, often ruminating about the experience to accomplish this task (Epstein, 1991; Harber & Pennebaker, 1992; Horowitz, 1986; Janoff-Bulman, 1992; Tait & Silver, 1989). In the struggle to assimilate the past event, however, an individual may "get 'stuck' in the past, both voluntarily and through involuntary intrusions of ongoing thought processes" (Silver, Boon, & Stones, 1983, p. 89).

Intrusive thoughts and rumination may occur in response to many different types of trauma, such as war (Niederland, 1981; Solomon, 1993), childhood abuse (Briere, 1992; Silver et al., 1983), and natural disasters (McFarlane, 1988; Nolen-Hoeksema & Morrow, 1991; Shore, Tatum, & Vollmer, 1986), as well as other more common negative events such as the loss of a loved one and serious illness (Tait & Silver, 1989). As these

intrusive recollections tend to keep memories and thoughts of the trauma active and alive in people's consciousnesses (see Baum, 1990), they may ultimately alter temporal orientation. For example, many trauma survivors vividly reexperience aspects of their past trauma in their present lives (McCann & Pearlman, 1990; Niederland, 1981). Others experience milder shifts in temporal orientation in that they continue to think about the past event long after it has ended (Lomranz, Shmotkin, Zechovoy, & Rosenberg, 1985; Tait & Silver, 1989). Whereas intrusive thoughts and rumination may facilitate coping for some individuals (see Horowitz, 1986), for others such thoughts may reinforce the tendency to focus on the past negative event (cf. Lyubomirsky & Nolen-Hoeksema, 1993, 1995). Ruminative or intrusive thinking in the context of coping with trauma may then become a mechanism through which individuals ultimately develop and sustain a past temporal orientation (see also King & Pennebaker, 1995).

Ongoing cognitive involvement with a past trauma may also reinforce or intensify negative affect associated with the event (see, e.g., Baum, Cohen, & Hall, 1993; McIntosh & Martin, 1992; Nolen-Hoeksema & Morrow, 1991; Nolen-Hoeksema, Morrow, & Fredrickson, 1993; Rachman, 1981). These rekindled emotions about the past trauma may negatively bias individuals' views of their current situations (Nolen-Hoeksema, Parker, & Larson, 1994; Strack, Schwarz, & Gschneidinger, 1985; see also Bower, 1981) and reinforce their tendency to focus on the past (see Wohlford, 1966). Thus, individuals experiencing persistent intrusions from the past may get drawn into a negative cycle in which the intrusions of the past rekindle negative affect, which intensifies the tendency to focus predominantly on the past.

Unconscious influences of perception, memory, and learning (see Greenwald, 1992; Johnson & Sherman, 1990; Uleman & Bargh, 1989) may also help reinforce negative affect in the aftermath of trauma. For example, prior experience may exert an unconscious influence on current perception through the formation and subsequent priming of cognitive schema (Srull & Wyer, 1979). As a result, individuals may use information derived from past events inappropriately when assessing their present situation, which may produce errors in judgment about the current situation (Gilovich, 1981). Moreover, a series of experiments by Jacoby and Kelley (1987) suggest that memories of a previous experience may exert an unconscious, and often automatic, influence on an individual's perception and interpretation of subsequent events. That is, situation-specific contextual cues may unknowingly trigger associations with a past experience, prompting individuals to perceive and interpret a new situation as similar to a past traumatic event. This type of experience has been well documented in clinical samples of traumatized individuals and often leads to behavior that seems incompatible with the current situation (see Shay, 1994; van der Kolk, McFarlane, & Weisaeth, 1996).

Together, these cognitive and emotional processes may ultimately undermine an individual's ability to maintain an integrated, future-oriented temporal orientation. That is, the cognitive processing of trauma, and the activation of either trauma-related schemata or situation-specific cues, may trigger an emotionally laden memory, which can produce confusion between the past trauma and the current situation. Over time,

these processes may lead individuals to get stuck in their past. This, in turn, may make it difficult for them to deal with the demands of present life circumstances and may result in high levels of psychological distress.

Three studies were designed to examine the relationship between past temporal orientation and long-term psychological distress following trauma. Studies 1 and 2 tested this relationship cross-sectionally in two samples of individuals who had experienced a traumatic event many years ago. Study 3 addressed this issue longitudinally in a sample of southern California residents after the firestorms of 1993.

Studies 1 and 2

The present research explored the relationship between past temporal orientation and long-term distress in individuals who had experienced trauma. To examine these relationships, it was necessary to identify people who had experienced trauma many years ago and may have remained focused on their past experience. Study 1 was conducted with a sample of adult women who had experienced incest as a child, and Study 2 was conducted with a sample of veterans from the Vietnam War.

These two populations were selected for several reasons. First, they represent distinctly different types of trauma, commonly affecting a different segment of the population—one group is predominantly female, the other overwhelmingly male. At the same time, both incest and war may severely threaten an individual's most basic assumptions about the self and the world (Janoff-Bulman, 1992; McCann & Pearlman, 1990). As a result, individuals who have experienced these events would be at risk for becoming stuck in their past experiences. Moreover, the length of time that has passed since these individuals were exposed to their traumas is long enough to allow the dynamic of becoming stuck in the past to occur. As past temporal orientation is considered a fundamental cognitive bias, and rumination is but one process that may contribute to its development, we hypothesized that predominantly past-oriented respondents would report significantly more current psychological distress than those who were present or future oriented, even when controlling for the degree of rumination reported by respondents.

Method

Participant Recruitment

Participants for Study 1 were recruited through widespread multimedia publicity requesting adult women who had experienced incest (self-defined) with a father or other male guardian to volunteer to complete an anonymous questionnaire and return it by mail. Public service announcements recruiting participants appeared in newspapers and on radio and television stations throughout southern Ontario, Canada. In addition, recruitment posters were mailed to YMCAs and YWCAs, women's employment centers, women's information and referral centers, and student centers. Women who had experienced father-daughter incest were invited to write to the research office or call a toll-free telephone number to request a questionnaire about their incest experience. In response to the recruitment effort, 96 eligible women requested the questionnaire and 77 completed and returned it, representing an 80% return rate (see Silver et al., 1983).

Participants for Study 2 were recruited using nationwide publicity, through public service announcements requesting veterans of the Viet-

nam War to complete an anonymous mail-in questionnaire. Individual letters announcing the study were sent to all chapters of the Vietnam Veterans of America. Announcements were also made in general circulation newspapers, in veterans' magazines and newsletters, on computer bulletin boards, on radio stations, in prisons, at veteran outreach centers, and at the Vietnam Veterans' Memorial in Washington, D.C. Individuals who had served in the military in Vietnam were invited to write or call a toll-free telephone number and request a questionnaire about the aftereffects of the Vietnam experience. During the initial response to the recruitment effort, a total of 1,722 surveys were sent out and 1,126 were completed and returned, representing a 65% return rate.¹ Because the method selected for assessing temporal orientation involved coding numerous open-ended questions and the sample necessary for this task was far smaller than the total sample obtained in the larger study, we decided that a smaller subsample should be drawn for the purposes of the present analysis. In addition, as data collection for this study took over 2 years to complete, we deemed it necessary to control for history effects in obtaining this subsample. Therefore, we selected 220 veterans from the larger sample by drawing a sample of 20 from each set of 100 questionnaires, which were numbered according to the order in which they were returned. Because 62 of the respondents in this subsample did not answer some of the specific questions used for coding, the final sample consisted of 158 veterans.

Procedure

For both studies, participants received by mail, and anonymously returned, questionnaires that included standardized measures of psychological distress and fixed-response items designed specifically for each study that addressed cognitive, emotional, and social responses to their experiences. In addition, in Study 1, a series of 11 open-ended questions asked participants to describe the characteristics of their incest experiences, the meaning of the experience for their current lives, and their personal responses to it. In Study 2, a series of 10 open-ended questions asked participants to describe the characteristics of their military experience, their homecoming experience, and the meaning and impact of their war experiences on their current lives. In each study, coders who were unaware of all hypotheses were similarly trained to read respondents' answers to the open-ended questions and systematically identify each respondent's predominant temporal orientation, as described below.

Measures

Psychological distress. Distress was measured in both Studies 1 and 2 using the SCL-90-R, a 90-item standardized self-report measure of psychopathological symptomatology (Derogatis, 1983). The SCL-90-R provides the global severity index (GSI) of psychological distress, which represents the average level of psychological distress across symptoms and has been shown to have good reliability and validity in community-based samples. Respondents used a 5-point intensity scale, ranging from *not at all* (0) to *extremely* (4), to indicate how distressed they were by each of 90 symptoms in the previous week. Cronbach's alphas were .92 (Study 1) and .97 (Study 2).

Temporal orientation. In both Studies 1 and 2, temporal orientation was assessed through the systematic coding of respondents' answers to the open-ended questions described above. Coders were trained to use a set of predetermined criteria to make an inference about temporal orientation. They then read through respondents' answers to the open-ended questions and applied these criteria to identify each participant's temporal orientation.

In Study 1, two coders read participants' answers to 11 open-ended

¹ A second wave of surveys ($N = 304$) was sent out after the initial 1,126 were returned.

questions and assigned scores representing the degree to which each participant demonstrated involvement in the past, the present, and the future. Past orientation was reflected in statements such as "I can't let go of this experience." Present orientation was identified through statements such as "I can't change the past, so I live my life today." Future orientation was represented in statements such as "I plan to get through this and have a new life." Coders judged the degree to which respondents expressed each orientation on a scale that ranged from *none* (1) to *a lot* (3). Because no respondents rated a "3" in more than one category, they were then categorized as predominantly oriented toward the past, the present, or the future on the basis of their highest score. Interrater agreement for coding respondents' temporal orientation was 93%, and disagreements were negotiated between the coders.

In Study 2, two coders used a similar method to determine temporal orientation as expressed by the veteran in answers to 10 open-ended questions described above. Because the answers given by the veteran did not always provide sufficient information to rate the degree of past, present, and future orientation, coders used the predetermined criteria to categorize respondents as predominantly past, present, or future oriented. A past temporal orientation was identified by statements such as "You can never leave Vietnam . . . it stays with you forever." Present temporal orientation was reflected in statements such as "Here and now is where I am at," and future orientation was captured in statements such as "[I] set goals and go after them." Interrater agreement for predominant temporal orientation was 82%, and disagreements were jointly negotiated by the coders.

Rumination. Three items assessed the frequency of intrusive thoughts or ruminations in Study 1. Using a 5-point scale ranging from *never* (1) to *always* (5), respondents were asked how often they found that "memories, thoughts, or mental pictures of your incest experience pop into your mind"; "you have difficulty doing other things because thoughts or memories of your incest experience keep coming to mind"; and "you can't get thoughts or memories about your experience out of your mind even when you want to." The internal consistency of these items was high ($\alpha = .87$), and the items were averaged to form an index of rumination.

In Study 2, eight items were used to assess rumination. They included such items as "Do memories, thoughts, or mental pictures of your Vietnam experiences come into your mind?"; "Do you ever find that you can't get memories, thoughts, or mental pictures of your experiences in Vietnam out of your mind even when you want to?"; and "Do you ever find you have trouble doing other things because memories, thoughts, and mental pictures of your Vietnam experiences keep coming into your mind?" Items were scored on a 5-point scale ranging from *No, never* (1) to *Yes, all the time* (5). The internal consistency of these items was high ($\alpha = .88$), and the items were averaged to form an index of rumination.

Results

The Sample

Participants in Study 1 ranged in age from 18 to 72 years old ($M = 33$). Outward indicators suggested that they were functioning reasonably well in the community. Fifty-three percent were married and 69% had children, 85% had completed high school, 12% had university degrees, and 97% were employed as unskilled workers (waitresses, factory workers, salespersons), clerical workers, or professionals (nurses, teachers, and managers). Eighty-two percent of the women reported having sought professional assistance for emotional problems at some point in their lives, and 49% of the women reported that they sought therapy specifically to deal with their incest experiences.

The majority of incest offenders were the biological fathers of these women (62%), followed by other male guardians (e.g., grandfather, foster father; 21%) and stepfathers (17%). The incest began, on average, at 8 years of age and terminated, on average, at age 13. The most common form of incestuous contact was genital fondling, which occurred in 96% of the cases. Other forms of contact included breast fondling (79%), oral-genital contact (62%), attempted intercourse (67%), intercourse (39%), and anal intercourse or penetration with a foreign object (7%). Twenty-five percent of the sample reported that physical violence accompanied the incest at least sometimes, and 57% reported being physically forced to participate. The incest was frequent and of long duration in many cases: 51% reported that encounters occurred once a week or more, and 47% reported abuse lasting 5 years or more.

In Study 2, 99% of the respondents were men. Their ages ranged from 40 to 67, with a mean of 49 years. The ethnic breakdown of the sample was 86% non-Latino White, 7% Latino, 4% African American, 2% Native American, and 1% Asian American. Respondents' previous years' incomes ranged from \$0 to \$250,000, with a median income of \$50,000. Sixty-eight percent of the veterans were married, and 83% had children. The majority of the sample had a high school diploma or its equivalent, and many had received a college degree. Twenty-five percent had completed 4 years of college, and another 23% had completed an advanced degree. Fifty-nine percent of the veterans had contacted a counselor regarding their experiences in Vietnam.

Respondents represented a wide range of military experiences while in Vietnam. Seventy-five percent of the respondents had enlisted and 25% had been drafted, and the sample included representatives of each of the four major branches of the military: 59% Army, 24% Marines, 12% Navy, and 5% Air Force. The age at which respondents had been sent to Vietnam ranged from 17 to 43 years old, with an average of 22 years; the length of time spent in Vietnam ranged from 3 months to 5 years, with an average of 1 year and 5 months. Thirty percent of the sample reported having been seriously injured in combat.

Predominant Temporal Orientation

Table 1 presents correlations among the intensity ratings of past, present, and future orientation in Study 1 that were used to identify respondents' predominant temporal orientation. Alto-

Table 1
Correlations Among Temporal Orientation Intensity Ratings and Psychological Distress in Women Who Had Experienced Father-Daughter Incest

Variable	1	2	3	4
1. Past orientation	—			
2. Present orientation	-.69**	—		
3. Future orientation	-.03	.06	—	
4. Psychological distress	.41**	-.42**	-.24*	—

Note. Nonparametric correlations were used because the temporal orientation intensity ratings did not represent a true interval scale.

* $p < .05$. ** $p < .01$.

gether, 43% ($n = 33$) of the women were classified as predominantly past oriented, 51% ($n = 39$) were classified as present oriented, and 0% were classified as predominantly future oriented. Five respondents (6%) were rated as somewhat past, somewhat present, and not at all future oriented. These cases were categorized with the past-focused women for the following analyses.² In Study 2, 25% ($n = 40$) of respondents were coded as predominantly past oriented, 46% ($n = 73$) as predominantly present oriented, and 29% ($n = 45$) as predominantly future oriented.

Long-Term Distress

Correlations between the intensity ratings of temporal orientation and psychological distress in Study 1 are presented in Table 1. For both Studies 1 and 2, we attempted to identify variables that may have influenced both temporal orientation and long-term distress. For example, in Study 1, the length of time since termination of the incest and the severity of the incest varied widely. Thus, we conducted an analysis to assess whether the past-oriented women had had more recent or severe incest experiences. Results indicated that the length of time since the incest had ended was not significantly different for women who were predominantly past oriented ($M = 18.47$ years, $SD = 9.98$) than it was for women who were predominantly present oriented ($M = 21.24$ years, $SD = 12.47$), $t(75) = -1.07$, *ns*. Similarly, the incest experiences were no more severe, as rated on a 6-point severity scale, for the past-oriented women ($M = 4.03$) than they were for the present-oriented women ($M = 3.74$), $t(67) = 1.07$, *ns*. Past-oriented women did report, however, significantly more rumination ($M = 3.32$) than present-oriented women ($M = 2.47$), $t(75) = 4.39$, $p < .001$, and rumination was positively associated with distress ($r = .57$, $p < .001$). As a result, we controlled for rumination in subsequent analyses.

The relationship between temporal orientation and long-term distress was then examined in Study 1, controlling for both the length of time since the incest had terminated (as it was associated with the level of distress participants reported, $r = -.29$, $p < .01$) and rumination. As shown in Table 2, past-oriented women reported significantly more distress ($M = 1.44$) than present-oriented women ($M = 0.94$), even after controlling for the length of time since the incest had ended and the degree to which the women reported ruminating about the incest experience, $F(3, 72) = 17.31$, $p < .001$.³

In Study 2, combat-related experiences and the length of time since the veterans had returned from the war varied widely in the sample, so we conducted analyses to assess whether temporal orientation was related to combat intensity or duration, or recency of return from the war. Results indicated that temporal orientation was not related to the intensity of combat exposure, as measured on a 5-point intensity scale (past $M = 3.27$, present $M = 3.01$, future $M = 2.88$), $F(2, 154) = 1.28$, *ns*; the length of time in combat, as measured by the number of months spent in combat (past $M = 11$ months, present $M = 10$ months, future $M = 8$ months), $F(2, 123) = 1.17$, *ns*; and the length of time since returning from the war, as measured by the number of years since the veterans returned (past $M = 22.8$, present $M = 23.3$, future $M = 23.4$), $F(2, 152) = 1.76$, *ns*. As in Study 1,

temporal orientation was associated with rumination, such that the past-oriented veterans reported significantly more rumination ($M = 3.90$) than the present- ($M = 2.97$), and future-oriented veterans ($M = 2.71$), $F(2, 155) = 30.61$, $p < .001$. Rumination was also significantly correlated with distress in this sample ($r = .70$, $p < .001$).

The relationship between temporal orientation and long-term distress was then assessed in Study 2, controlling for the intensity of combat exposure (as it was associated with the level of distress veterans reported, $r = .35$, $p < .001$) and rumination. As can be seen in Table 2, veterans who were predominantly focused on the past ($M = 1.96$) were significantly more distressed than veterans who were predominantly focused on the present ($M = 1.03$) or the future ($M = 0.75$), $F(4, 151) = 47.66$, $p < .001$, even after controlling for combat intensity and the degree of rumination reported.

Discussion

In both of the first two studies, a past temporal orientation was associated with distress. Moreover, individuals who remained focused on the past many years after the traumatic event had terminated reported significantly higher levels of psychological distress than those individuals who were either predominantly present or future oriented. In fact, the distress levels reported by the past-oriented women in the incest sample were comparable to norms obtained from a sample of psychiatric inpatients ($M = 1.44$ vs. $M = 1.30$, respectively), $t(344) = 1.02$, *ns*, and the veterans who were predominantly past-oriented reported distress levels that significantly exceeded the norms of psychiatric inpatients ($M = 1.96$ vs. $M = 1.30$), $t(351) = 4.83$, $p < .001$ (see Derogatis, 1983).

Although the retrospective nature of these studies makes it difficult to determine the direction of the relationship between past orientation and distress, there is likely to be a reciprocal relationship between them. That is, being focused on the past may trigger psychological distress associated with the past event, which in turn may lead respondents to focus on the past in order to understand the distress (cf. Wohlford, 1966). Similarly, recent research suggests that distressed individuals may become stuck in a self-perpetuating cycle of rumination to gain insight about themselves and their distress (Lyubomirsky & Nolen-Hoeksema, 1993). To the extent that rumination influences past orientation, this self-perpetuating process may prolong distress and help to maintain a past temporal orientation.

In both of the first two studies, from one quarter to almost one half of the respondents were classified as predominantly past oriented. Of course, it is possible that the sampling strategy used in both studies inflated these percentages relative to the

² All analyses were conducted twice—once with these five ambiguous cases categorized as past oriented, and again with these five ambiguous cases categorized as present oriented. The results of both analyses were essentially identical.

³ These regression analyses were also conducted using the coders' continuous intensity ratings for temporal orientation, and the results were essentially identical to those reported here. To provide consistency across all three studies, however, the analyses using the predominant temporal orientation ratings are reported in this article.

Table 2
Regression Models Assessing the Relationship Between Psychological Distress and Coders' Ratings of Past Temporal Orientation in Studies 1 and 2

Variable	<i>b</i>	<i>SE</i>	<i>T</i>	ΔR^2	<i>F</i> (ΔR^2)
Study 1 (<i>N</i> = 76) ^a					
Block 1					
Time since incest ended	-.01	.01	-2.29*		
Rumination	.27	.07	4.01**	.37	21.76***
Block 2					
Predominant temporal orientation ^b	-.30	.13	-2.38*	.05	5.64*
Study 2 (<i>N</i> = 156) ^c					
Block 1					
Combat intensity	-.02	.05	-0.36		
Rumination	.61	.07	8.13***	.52	84.61***
Block 2					
Present orientation ^d	-.34	.13	-2.55**		
Future orientation ^e	-.51	.15	-3.34***	.03	5.62**

^a One case with several outlying scores was dropped from this analysis. ^b Past orientation = 0; present orientation = 1. ^c Two cases with several outlying scores were dropped from this analysis. ^d For the dummy-coded variable, past = 0 and present = 1, so higher scores represent present orientation. ^e For the dummy-coded variable, past = 0 and future = 1, so higher scores represent future orientation.
 * $p < .05$. ** $p < .01$. *** $p < .001$.

populations from which they were drawn. That is, it is possible that a large number of individuals who volunteered to participate in a research project on incest or Vietnam War experiences may have been particularly oriented toward their pasts. Although general population norms are not available, prior research does suggest that women generally tend to be more future oriented than men and that past orientation is relatively rare in the United States (Gonzalez & Zimbardo, 1985). However, the lack of prior research on temporal orientation in traumatized individuals makes it difficult to ascertain the degree to which these tendencies are relevant for individuals who have experienced trauma or to assess the extent to which our samples are representative of the overall population of traumatized individuals.⁴

Nonetheless, the majority of individuals in both Studies 1 and 2 were not predominantly past oriented—rather, they were predominantly present- or future-oriented. Because severity of trauma did not appear to be related to temporal orientation measured decades after the trauma had terminated, Studies 1 and 2 offer little to explain the variability in temporal orientation. Moreover, they do not directly address the mechanisms by which some distressed trauma survivors remain predominantly focused on their pasts whereas others can focus on their present and future. Although this issue has not been addressed directly in prior research, a longitudinal study of 101 Loma Prieta earthquake survivors found that over one half of the sample reported distortions in temporal perceptions one week after the earthquake and that these distorted temporal perceptions were associated with subsequent distress (Cardena & Spiegel, 1993). These findings raise the possibility that immediate temporal responses to trauma may be related to subsequent adaptation. Hence, Study 3 was designed to address whether temporal perceptions in the immediate aftermath of trauma are associated with temporal orientation and distress over time.

Study 3

Traumatic events are known to exert a disintegrating effect on victims' cognitive-emotional systems (Janet, 1925; Janoff-Bulman, 1992; Stover & Nightingale, 1985). By challenging and potentially shattering some people's most fundamental assumptions about themselves and the world (Epstein, 1991; Janoff-Bulman, 1992), trauma creates an environment in which the cognitive structure necessary for interpreting and assimilating a new event may be left in disarray. Given the pivotal role of temporal perceptions in organizing human experience (Zimbardo, 1994), it seems reasonable to expect the disintegrating effects of trauma to influence temporal perceptions as well.

In fact, a number of alterations in temporal perceptions have been identified among traumatized individuals seen in clinical settings. For example, short-term responses to both acute and ongoing traumas (e.g., being held hostage) include temporal distortions such as confusing day and time, narrowing attention to the present, perceiving oneself to be in slow motion, feeling as though time itself has stopped, confusing the order of events experienced, experiencing a sense of timelessness, feeling fragmentation in the continuity between past and present, and having a foreshortened or obliterated sense of the future (Cardena & Spiegel, 1993; Herman, 1992; Niederland, 1981; Terr, 1983). These alterations in temporal perceptions have been called "temporal disintegration or discontinuity"—a process in which sequential thinking is impaired and "the here-and-now appears to have nothing before or after it . . . and may seem isolated from the continuity of time . . ." (Melges, 1982, p. 135).

⁴ We might also note that the proportions of past, present, and future temporal orientation identified in Study 2 are remarkably similar to those of Study 3 (results follow), despite the fact that a very different recruitment strategy was used.

Research in cognitive psychology also suggests that when people experience new and extraordinarily complex stimuli, their ability to process the incoming information is delayed, thereby prolonging temporal perceptions of duration (Ornstein, 1969) and extending time in the present. When one faces the threat of an impending traumatic experience, this response may be adaptive (see Friedman, Chodoff, Mason, & Hamburg, 1963; Visotsky, Hamburg, Goss, & Lebovits, 1961). That is, by narrowing one's temporal focus to the present event, individuals may enhance their ability to cope with the demands of the situation at hand. If, however, attention becomes so narrowly focused on the new and unusual stimulus that individuals experience temporal disintegration (e.g., lose continuity between past, present, and future), these cognitive responses may ultimately prove detrimental for adaptive functioning in the long-term aftermath of traumatic experiences. For example, empirical evidence has suggested that as one's sense of the future diminishes, one's focus on the past is enhanced (Fraisie, 1963; Wohlford, 1966). Hence, foreshortening of the future in the immediate aftermath of trauma may encourage survivors to focus on the recent (and soon-to-be past) trauma, especially if the individual is also experiencing negative affect (cf. Wohlford, 1966). Moreover, temporal disintegration in the face of trauma may interfere with the assimilation of the negative event through its disorganizing effects on mental processes (Melges, 1982). For example, because a stable sense of identity is drawn, in part, from past experiences and future dreams and expectations (see Albert, 1977; Melges, 1990), temporal disintegration may be associated with difficulties assimilating the event into a stable sense of self. In addition, the disintegration of temporal perceptions may interrupt the natural process of differentiating and categorizing experiences into the past, present, and future (Zimbardo, 1994). Thus, as time passes, traumatic events objectively become part of the past, but subjectively, they may remain an active, salient, and present psychological experience (e.g., Lomranz et al., 1985; Niederland, 1981; van der Kolk & van der Hart, 1991).

In summary, the extent to which traumatic events foster temporal disintegration in some individuals may lead them to have difficulty assimilating the event, which, in turn, may create the cognitive conditions necessary to keep them mentally stuck in their past experience (e.g., Janet, 1925). To the extent that past temporal orientation is associated with distress, we would expect those individuals who experience the greatest temporal disintegration in the immediate aftermath of a trauma to be more focused on the past over time and to have higher levels of psychological distress than individuals who do not experience high levels of temporal disintegration.

Moreover, prior research on coping with trauma suggests that its debilitating effects may derive from several pretrauma and trauma-related characteristics. For example, prior exposure to trauma (Green, 1993; Herman, 1992) and the severity of personal loss associated with trauma (Green, 1993; Kaniasty & Norris, 1993) may both be related to the intensity of an individual's immediate response to the event. In addition, the degree to which trauma threatens personal identity may also influence an individual's response to it (Cole & Putnam, 1992; Herman, 1992). As has been previously suggested, the stability of one's physical environment strengthens and supports the stability of the self over time (Csikszentmihalyi & Rochberg-Halton, 1981;

Proshansky, Fabian, & Kaminoff, 1983). Thus, to the extent that people identify themselves with their personal physical spaces, the potential (or actual) loss of their homes may threaten their identity by endangering the physical place that has represented the self in the past and by altering the course of their futures (Proshansky et al., 1983). Drawing from these findings, we hypothesized that the degree of temporal disintegration experienced in the immediate aftermath of trauma will be associated with prior exposure to trauma, the severity of loss experienced, and the degree of threat to identity experienced in response to the trauma.

In Study 3, the relationships among acute, stress-related temporal disintegration; past temporal orientation; and psychological functioning over time were examined in a sample of southern California residents who experienced the firestorms of 1993. The unfortunate occurrence of these fires created a situation in which it was possible for us to interview a number of residents immediately after they had experienced a traumatic event. The location of the event also made it feasible for us to conduct follow-up interviews, thereby allowing a longitudinal analysis of the relations among immediate temporal disintegration, temporal orientation, and distress in a group of individuals who had experienced a negative life event. Follow-up interviews also allowed us to examine whether the relationships among these variables could be explained by ongoing cognitive involvement in the event (e.g., ruminations) or ongoing chronic stressors that might be rekindling memories of the past trauma and heightening distress.

Method

Participant Recruitment

Residents of two fire-damaged communities were recruited for this study: Laguna Beach, California and the Malibu-Topanga area of Los Angeles County, California. Both communities were devastated by firestorms within a 1-week period in the fall of 1993, and the damage estimates within each community were quite similar (personal communication, Los Angeles County Sheriff's Department and Laguna Beach Police Department, November 1993). To assess immediate responses in the early hours following the fire, the sampling procedures had to be simple and quick. Using media reports of damage as a guide, we identified target areas of heavily damaged neighborhoods in both communities. Teams of trained interviewers were assigned to work with a graduate student who supervised the interviewing process.

Participants were recruited in the neighborhoods of their respective communities within 36 hr of their return home after a 36-hr forced evacuation period. Altogether, 142 residents were approached and 85 consented to being interviewed at that time, representing a 60% favorable response to the initial contact. Four weeks later (Wave 2), 74 of the residents agreed to participate in a second interview (87% response rate); 6 months after the fires (Wave 3), 72 of these residents agreed to a third interview (85% response rate); and 1 year after the fires (Wave 4), 71 residents were interviewed a fourth time (84% response rate).

Procedure

Interviewers approached individuals in each of the heavily damaged neighborhoods, introduced themselves as being from the University of California, established that the individual was a resident of Laguna Beach or the Malibu-Topanga area, and requested his or her participa-

tion in a brief, tape-recorded interview about how he or she was feeling regarding the firestorm. To facilitate this process, interviewers wore name badges with the official University of California emblem and carried clipboards to convey the legitimacy of their request for participation in our study. Eligible candidates for recruitment included adults who were assessing damage to their home, in the process of cleaning up after the fire, or walking on the streets of the targeted neighborhoods. Residents were also approached at the Federal Emergency Management Agency centers set up in their respective communities to help individuals apply for federal assistance. Consenting residents were informed of their right to terminate the interview at any time. The initial interview lasted approximately 30 min.

Because the initial interviews were conducted in the immediate aftermath of the fire, it was essential to offer participants professional referral information. Upon completion of the interview, participants were given a list of names, addresses, and telephone numbers of community mental health agencies and local mental health professionals willing to provide assistance to residents.

Respondents were telephoned approximately 4 weeks (Wave 2), 6 months (Wave 3), and again 1 year after the initial interview (Wave 4) and asked to participate in a follow-up interview. When possible, follow-up interviews were conducted by the same interviewer who conducted the initial interview. Because many of the respondents suffered partial or complete loss of their homes, they were offered the option of having follow-up interviews conducted at a place and time that was convenient for them within a 2-week window. To accommodate individuals who had lost their homes, a conference room at a local hotel was made available for interviews during all waves of follow-up interviews. At the end of each follow-up interview, interviewers gave respondents a sealed thank-you letter containing \$20 (Wave 2), \$25 (Wave 3), and \$30 (Wave 4) as compensation for their time and effort.

Interview Instrument

Each of the interviews included a standardized introduction and set of probes specifically designed for the open-ended questions. The initial interview was designed to be a brief assessment of respondents' immediate cognitive, emotional, and social responses to the firestorm. The interview also included questions about the degree to which respondents' homes were damaged, how long they had lived in their homes, how attached they were to their homes, and what items they took with them if and when they evacuated.

The three follow-up interviews were designed to assess the ongoing cognitive, emotional, and social responses to the firestorm experience. They each included a standardized, self-administered measure of psychological distress, as well as open-ended and fixed-response items that were based on previous research and modified for this study.⁵ Descriptions of the measures relevant to the present study are presented in more detail below. Each of the follow-up interviews took approximately 1 hr to complete.

Measures

As the initial interview was conducted within 72 hr of the fires, it was important to avoid imposing on residents too greatly. Hence, brief measures of several constructs were used in the first interview; in subsequent interviews, more extensive assessments were made.

Wave 1

Frequency and intensity of negative emotion. The frequency with which respondents experienced four negative emotions in the past 24 hr was assessed using a 5-point scale ranging from *never* (1) to *always* (5). One item was selected from each of four negative affect subscales

(i.e., Depression, Anxiety, Hostility, and Guilt) of the Affects Balance Scale (Derogatis, 1975) on the basis of its having the highest factor loadings on each of the negative emotion factors in previous research (Fisher, Silver, Chinsky, Goff, & Klar, 1990). The intensity of each emotion experienced was also rated at each interview on a 4-point scale ranging from *mildly* (1) to *extremely* (4). The internal consistency of the frequency and intensity of negative emotion was .63 and .52, respectively.

Emotional functioning. Emotional functioning on the day after the fires was assessed with a 7-item scale addressing emotional responses in the past 24 hr. The scale was found to be a reliable measure of emotional functioning in a study of parents coping with the sudden deaths of their infants (Wayment, Silver, Wortman, & Lepore, 1998). Sample items include how often residents "cried"; "felt numb, in shock, or stunned"; and "felt like crying, but tried not to break down." Items were scored on a 5-point scale with endpoints of *never* (1) and *all of the time* (5). Factor analysis identified a single factor common to these items with six of the seven items loading highly (>.30) on that factor. These six items were then averaged to form a single index of emotional functioning ($\alpha = .73$). Higher scores on this index indicated greater difficulty functioning.

Somatic symptomatology. Somatic symptomatology was assessed during the first interview using a modified version of the somatization subscale of the SCL-90-R (Derogatis, 1983), which identifies the degree to which respondents were distressed by 12 physical health symptoms (e.g., nausea or upset stomach, faintness or dizziness, pains in heart or chest).⁶ Instructions were modified for this study so that residents were asked about symptoms they had experienced in the past 24 hr only. Items were rated on a 5-point scale ranging from *not at all* (0) to *extremely* (4). Internal consistency of the items was high ($\alpha = .84$).

Temporal disintegration. Temporal disintegration (Appendix A) was assessed during the initial interview with seven items that were modeled conceptually after two sources: (a) Terr's (1983) clinical observations of alterations in the temporal perceptions of traumatized individuals, and (b) items from the Temporal Integration Inventory (Melges, 1982), which assesses the degree of continuity, integration, and organization of thoughts about past, present, and future experiences. Items were scored on a 5-point scale ranging from *never* (1) to *all the time* (5). Each item was asked in reference to the previous 24-hr period only. Factor analysis of these items yielded a single factor composed of the seven items, which were averaged to create an index of temporal disintegration, with higher scores representing greater temporal disintegration. Internal consistency of the scale was high ($\alpha = .83$).

Demographics. Respondents were asked about their age, level of education completed, occupational status, whether they owned or rented their homes, and the length of residency in their homes. Interviewers also recorded respondents' gender at the end of the interview.

Waves 2-4

Emotional distress. The Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983), a 53-item scale assessing psychopathological symptomatology, was used as a measure of psychological distress in follow-up interviews. The BSI has been found to be reliable and valid in normative populations, and its scores are highly correlated with comparable SCL-90-R scores (Derogatis & Melisaratos, 1983). Respondents indicated on a 5-point intensity scale ranging from *not at all* (0) to *extremely* (4), how distressed they were by each symptom in the

⁵ A copy of the measures used in this study may be obtained from E. Alison Holman.

⁶ Some residents received only 9 of the 12 items on the somatization subscale, so the index computed for these analyses was created using the 9 symptoms completed by all residents.

previous week. The items were averaged to produce the GSI, which is an overall measure of psychological distress. This measure was administered during each of the follow-up interviews.

Temporal orientation. Temporal orientation was assessed through systematic coding of respondents' answers to a series of six open-ended questions asked during the third interview (i.e., 6 months postfires). The questions used for this coding addressed the meaning of the fire experience for respondents' current lives, the quality of their current life situations, the nature of their ongoing social relationships, and their personal responses to the firestorms. As in Studies 1 and 2, two trained coders read transcripts of the open-ended responses and used predetermined criteria to make an inference about each respondent's predominant temporal orientation. Because there were only a few open-ended questions available for this coding, as in Study 2, coders identified respondents' predominant temporal orientation rather than assessing the degree to which respondents expressed each temporal orientation. A past temporal orientation was identified by statements such as "I guess it just made me think about the past more"; present orientation was identified through statements such as "It's over and done with and you go on one day at a time"; and future orientation was identified through statements such as "Mainly I think about how it is going to look, new house, new pigeons, new me. . . ." Interrater agreement for coding predominant temporal orientation was 76%. Disagreements in the independent ratings were jointly negotiated by the coders.

To conduct more refined and systematic analyses of the relations among temporal perceptions and psychological distress, a second measure of temporal orientation was designed for the third and fourth interviews. The Temporal Orientation Scale (TOS; see Appendix B) is a 28-item questionnaire that includes three subscales representing past (nine items), present (ten items), and future orientation (nine items). The initial pool of items for this measure was drawn primarily from three sources: the Stanford Time Perspective Inventory (STPI; Zimbardo, 1990), a set of Q-sort statements developed by Braley and Freed (1971) to measure time orientation, and statements made by traumatized people that independent raters considered strongly past, present, or future oriented (Holman & Silver, 1994). The final instrument included a total of 13 STPI items (9 of which were reworded for this study); 7 items based on Braley and Freed's work; and 8 additional items designed specifically for this study (see Holman, 1996, for details of scale development).

The TOS asks respondents to rate the degree to which each item is true for them on a 5-point scale ranging from *not at all true* (1) to *very true* (5). Factor analysis of the items yielded seven factors with eigenvalues greater than one. However, examination of eigenvalues with a scree plot identified three primary factors, and examination of the item loadings suggested that the three factors represented past, present, and future orientation (see Holman, 1996). The internal consistencies of the items for each subscale in the third interviews were past ($\alpha = .82$), present ($\alpha = .73$), and future ($\alpha = .74$). The items within each of the three subscales were then averaged to form indices of past, present, and future orientation.

Rumination. The degree to which residents were ruminating about the firestorms was assessed during Waves 2–4 using a 7-item scale that asks respondents to estimate the frequency with which they had had intrusive thoughts about the fires over the past week using a 5-point scale that ranged from *No, never* (1) to *Yes, all the time* (5). The scale was a modified version of the measure used by Lepore, Silver, Wortman, and Wayment (1996), and it included such questions as "During the past week, have any memories, thoughts, or mental pictures of the fire or its aftermath come into your mind?" and ". . . did you ever find that you couldn't get memories, thoughts, and mental pictures of the firestorm or its aftermath out of your mind even though you wanted to?" Factor analysis of the items suggested the presence of one factor of ruminative thoughts, and scale reliability was high ($\alpha = .86$).

Exposure to the fire. The degree to which each participant had been

exposed to the fire was assessed 4 weeks after the fires (Wave 2) using Spiegel's (personal communication, November 1993) 12-item measure of personal contact with a fire. Respondents were asked to indicate whether they had had a variety of experiences, such as seeing or inhaling the smoke or flames, feeling the fire's heat, losing their residences, or being injured by the fire. The questions were asked in a yes–no format, and summary scores were created so that higher scores on the index represented greater exposure to the fire itself.

Prior experience with trauma. A modified version of the Diagnostic Interview Schedule (Robins, Helzer, Croughan, Williams, & Spitzer, 1981) was used at Wave 2 to assess the number and types of prior traumas experienced. This measure asks respondents about events that are considered outside the range of normal life experience such as military combat and witnessing someone being killed. Respondents were asked whether they had experienced any such events, and if they had, they were asked to describe them. Questions were worded so that respondents could disclose as many prior experiences as they were comfortable discussing.

Ongoing stressors. Degree of ongoing stress was assessed at Waves 3 and 4 with a series of 10 questions adapted from Wayment et al. (1998). Items asked respondents whether such events as moving, losing their jobs, experiencing financial strain, or losing a friend or family member had occurred since the fires. In addition, respondents were asked if they had had any other experiences since the fires that were stressful and then were asked to describe them. The questions were asked in a yes–no format, and summary scores were created that represented the number of ongoing stressors respondents had experienced (possible range, 0–10).

Results

The Sample

The initial sample consisted of 44 women and 41 men, ranging in age from 21 to 83 years ($M = 47$ years). The sample was overwhelmingly non-Latino white (94%), with 2.5% African American, 2.5% Latino, and 1% Pacific Islander. Fifty-two percent of the sample were married, and 57% had completed a bachelor's degree. Ninety-seven percent of the sample were currently employed.

The length of residence in the home ranged from 1 to 34 years, with an average of 12 years' residence. Sixty-seven percent of the sample owned their homes. Eighty-three percent of the respondents said they were either very or extremely emotionally attached to their homes, and 65% said they felt their home was at least somewhat irreplaceable. Of the 85 residents who completed the first interview, 34 (40%) had evacuated their homes, 29 (34%) had been unable to return home, and 22 (26%) had stayed home during the fire (i.e., had ignored evacuation orders). Finally, 24 residents (28%) reported having lost their homes in the fire, and an additional 36 (42%) suffered smoke, soot, and partial burn damage. One elderly resident was dropped from all subsequent analyses because both interviewers and her responses indicated that she did not seem to have understood the questions.

Attrition Analyses

To identify possible systematic trends in attrition, residents who participated in all four interviews were compared with those who dropped out after the first interview, using *t* tests or

chi-square tests where appropriate.⁷ The variables on which comparisons were made included Wave 1 frequency and intensity of negative emotion, emotional functioning, somatic symptomatology, temporal disintegration, the degree of attachment to one's home, age, gender, whether one rented or owned one's home, and whether or not one's home had been lost. No significant differences were found between the groups.

Analytic Strategy

In order to get a conceptually meaningful assessment, sufficient time had to elapse between the initial interview and the assessment of past temporal orientation. Therefore, the Wave 3 measurement of temporal orientation was used in all of the following analyses. Because the degree of rumination and ongoing stress were considered possible alternative explanations for the effects of past temporal orientation, we also used Wave 3 assessments of these constructs as control variables. In addition, because the goal of the analyses was to predict distress over time, the outcome measure used in these analyses was Wave 4 emotional distress. This approach allowed prediction of changes in distress over a 1-year period, while simultaneously minimizing the methodological inflation of correlations between past orientation and distress that would occur if they had been measured at the same time.

The first analysis was designed to replicate the analyses reported in Studies 1 and 2. As in the earlier studies, long-term psychological distress scores were regressed on predominant temporal orientation (as coded from the Wave 3 interview), controlling for initial distress, degree of rumination, degree of ongoing stress, degree of exposure to the fire, and loss of one's home. Subsequent analyses were designed to assess the relationships among immediate temporal disintegration after an acute stressor, past temporal orientation, and changes in emotional distress over time. We hypothesized that the degree of past temporal orientation reported by residents would mediate the relationship between immediate temporal disintegration and subsequent emotional distress. Specifically, it was expected that individuals who experienced the highest levels of temporal disintegration in the immediate aftermath of the fires would have a greater tendency to focus on the past several months later, and that a higher degree of past temporal orientation would be associated with higher levels of distress 1 year later. In these analyses, initial psychological distress levels, rumination, and the degree of ongoing stress were statistically controlled to minimize the likelihood that they would produce a spurious relationship between temporal disintegration, past temporal orientation, and long-term distress. In addition, age, gender, loss of one's home, and degree of exposure to the fire were also controlled in these analyses.

To test the mediating role of past temporal orientation on changes in distress, we conducted a series of four regression analyses (see Baron & Kenny, 1986). First, the residualized distress scores (Wave 4) were regressed on temporal disintegration scores (Wave 1). Second, the residualized distress scores (Wave 4) were regressed on the degree of past temporal orientation (Wave 3). Third, the degree of past temporal orientation (Wave 3) was regressed on temporal disintegration scores (Wave 1). Finally, the first regression was repeated, with the

past temporal orientation scores (Wave 3) entered into the analysis before temporal disintegration scores (Wave 1). If a mediating relationship existed, the relationship between temporal disintegration and residualized distress scores should have been diminished when the effects of past temporal orientation were partialled out.

Predominant Temporal Orientation

Of the 72 respondents who completed the 6-month interview, 7 did not provide enough information in their answers to the open-ended questions to allow coders to make an inference about their predominant temporal orientation. Of the remaining 65 respondents, 21% were coded as predominantly past oriented, 54% as predominantly present oriented, and 25% as predominantly future oriented.

Long-Term Distress

In the first analysis, the relationship between coder-rated predominant temporal orientation and long-term distress was examined, controlling for initial distress, loss of one's home, degree of exposure to the fires, degree of ongoing stress, and rumination (see Table 3). As in Studies 1 and 2, temporal orientation was significantly associated with psychological distress scores, $F_{change}(2, 56) = 4.79, p < .02$. The findings suggest that residents who were predominantly past oriented 6 months postfires were significantly more distressed 1 year postfires ($M = 0.90$) than those who were either present oriented ($M = 0.41$), $t(56) = -3.01, p < .01$, or future oriented ($M = 0.33$), $t(56) = -2.50, p < .01$.

Examination of correlations between the TOS past, present, and future subscale scores and psychological distress revealed that the three TOS temporal orientation scores were essentially independent of one another (see Table 4). The degrees of past and present orientation were both positively associated with 1-year distress scores, whereas future orientation was negatively associated with 1-year distress.

We subsequently used the TOS scores to address the relationships between immediate temporal disintegration, past orientation (Wave 3), and psychological distress (Wave 4). These relationships were tested in a series of regressions that controlled for initial distress level, age, gender, loss of one's home, degree of exposure to the fire, degree of ongoing stress, and rumination. In the first regression, immediate temporal disintegration was significantly associated with residualized distress scores ($b = .05$), $t(55) = 2.86, p < .01$, with higher levels of immediate temporal disintegration associated with higher levels of distress 1 year later. The second regression revealed that past temporal orientation was associated with residualized long-term distress scores ($b = .05$), $t(55) = 3.37, p < .001$, such that a greater focus on one's past 6 months after the fires was associated with higher distress 1 year after the fires. The third regression demonstrated that immediate temporal disintegration was

⁷ Eleven residents dropped out between the first and second interviews. As only 3 additional residents dropped out between Waves 2 and 4, the attrition analyses compared those who dropped after the first interview with those who completed all four interviews.

Table 3
Regression Model Assessing the Relationship Between Wave 4 Psychological Distress and Coders' Ratings of Wave 3 Temporal Orientation in Study 3 ($N = 65$)

Variable	<i>b</i>	<i>SE</i>	<i>T</i>	ΔR^2	$F(\Delta R^2)$
Block 1					
Wave 1 distress	.03	.02	1.30		
Degree of exposure to fire	.04	.02	2.34*		
Loss of home	-.09	.12	-0.81	.14	3.25*
Block 2					
Rumination (Wave 3)	.07	.09	0.79		
Number of stressors since fire (Wave 3)	.07	.03	2.10*	.12	4.90**
Block 3					
Present orientation ^a	-.38	.13	-3.01**		
Future orientation ^b	-.38	.15	-2.50**	.11	4.79**

^a For the dummy-coded variable, past = 0 and present = 1, so higher scores represent present orientation.

^b For the dummy-coded variable, past = 0 and future = 1, so higher scores represent future orientation.

* $p < .05$. ** $p < .01$.

significantly, and positively, associated with the degree of past temporal orientation assessed 6 months later ($b = .34$), $t(55) = 2.54$, $p < .02$.

In the final regression, the relationship between immediate temporal disintegration and residualized 1-year distress was substantially diminished when the degree of past temporal orientation reported at 6 months was entered into the analysis ($b = .03$), $t(54) = 1.97$, $p > .05$. These findings support the hypothesis that immediate temporal disintegration is associated with long-term distress through its relationship with past temporal orientation. That is, individuals who experienced the highest degree of temporal disintegration in the immediate aftermath of the fires were significantly more focused on the past 6 months later and experienced the highest levels of distress 1 year after the fires (see Figure 1 and Table 5), controlling for initial distress, age, gender, loss of one's home, degree of exposure to the fire, degree of ongoing stress, and rumination.^{8,9} It should also be noted that the relationship between immediate temporal disintegration and 1-year distress approached significance ($p < .06$) in the model that included past temporal orientation.

Supplemental Analyses

Although the aforementioned findings indicate that temporal disintegration in the immediate aftermath of a trauma is associ-

ated with a greater degree of past temporal orientation and psychological distress over time, they do not explain the mechanisms that may lead some individuals to experience immediate temporal disintegration. To test the hypothesis that severity of personal loss is associated with greater temporal disintegration in the immediate aftermath of trauma, we compared the degree of temporal disintegration reported by residents who had lost their homes with that of residents who had not lost their homes. In fact, residents who had lost their homes in the fires reported significantly higher levels of temporal disintegration immediately after the fires than those who had not lost their homes ($M = 2.82$ vs. $M = 2.24$), $t(83) = 2.72$, $p < .01$.

We then set out to test the hypothesis that greater temporal

⁸ Because the Wave 3 past, present, and future TOS scores were all significantly associated with 1-year distress, a second set of regressions was conducted in which Wave 3 past, present, and future TOS scores were all included as independent variables. When we controlled for initial distress, age, gender, loss of one's home, degree of exposure to the fires, ongoing stress, and rumination, all three temporal orientations were significantly associated with subsequent distress. However, immediate temporal disintegration was associated only with past orientation scores assessed 6 months after the fires, so the mediational analyses proceeded as originally hypothesized with a focus on past temporal orientation.

⁹ Because the wording of Items 8 and 18 of the TOS past orientation subscale may be interpreted as having a negative affective tone, the analyses were repeated with a six-item past subscale (i.e., with these two items removed). The pattern and significance of the findings were essentially identical to those reported above. In addition, because some individuals may have a predisposition toward maintaining a negative view of themselves and the world, it was important to test whether the tendency to see one's past negatively may help explain these findings. Moreover, it is possible that some people are more predisposed to focus on their pasts than others and that this tendency renders them more vulnerable to temporal disintegration. To test for these alternative explanations for our findings, we reran the entire set of regressions, controlling for two additional items: the proportion of thoughts focused on the past as reported in the first interview (0–100%) and the degree of negativity respondents ascribed to their pasts, as measured on a 5-point scale in the third interview. These analyses produced results that were essentially identical to those reported in the text.

Table 4
Correlations Between Temporal Orientation Scale Scores 6 Months After the Fires and Psychological Distress 1 Year After the Fires

Variable	Temporal orientation		
	1	2	3
1. Past	—		
2. Present	0.20	—	
3. Future	-0.13	-0.15	—
4. Temporal disintegration	0.22†	0.11	-0.18
5. Psychological distress	0.49***	0.34**	-0.27*

† $p = .06$ (marginally significant). * $p < .05$. ** $p < .01$. *** $p < .001$.

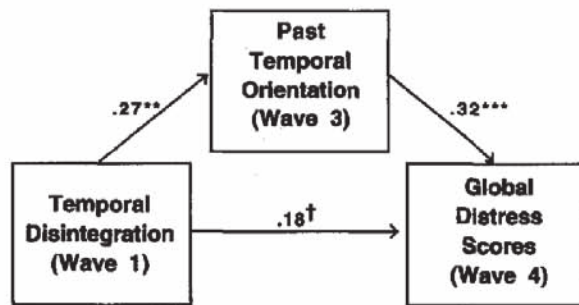


Figure 1. Relationships between Wave 1 temporal disintegration, Wave 3 past temporal orientation, and Wave 4 psychological distress, controlling for initial distress, age, gender, loss of one's home, degree of exposure to the fires, degree of ongoing stress, and rumination. † $p < .06$ (marginally significant). ** $p < .01$. *** $p < .001$.

disintegration in the immediate aftermath of trauma is associated with a prior history of trauma. Overall, 66% of the residents reported having experienced some form of prior trauma, which included such events as military combat, car accidents with fatalities, domestic violence, unexpected loss of loved ones, and being assaulted. When the degree of temporal disintegration reported by the residents who had experienced some form of prior trauma was compared with that of the residents who had not experienced prior trauma, temporal disintegration scores did not differ between these two groups. However, further analyses revealed interesting differences in the degree of temporal disintegration reported by individuals in the previously traumatized subsample. First, we compared the degree of temporal disintegration between those who had personal experience as the target of trauma (self) with those who had witnessed a traumatic event or knew someone else who had experienced trauma (other; e.g., being physically assaulted vs. watching another person get assaulted). In addition, we compared levels of temporal disintegration between those who had experienced acute trauma (e.g., physical assault) and those who had experienced chronic trauma (e.g., persistent family violence). We found that individuals who reported having experienced *chronic* trauma prior to the fires ($n = 18$) tended to report higher levels of temporal disintegration immediately after the fires than individuals who reported having experienced prior *acute* trauma ($n = 28$; $M = 2.74$ vs. $M = 2.24$), $F(1, 44) = 3.64$, $p = .06$. There were no differences between those who had direct, personal experience with trauma (self $M = 2.43$, $n = 22$) and those who had indirect experience with trauma (other $M = 2.44$, $n = 24$). However, an interaction emerged such that individuals who had direct experience with *chronic* trauma prior to the fires ($n = 7$) reported significantly higher levels of immediate temporal disintegration ($M = 3.18$) than individuals who had directly experienced prior *acute* trauma ($n = 15$; $M = 2.08$), $F(1, 44) = 4.24$, $p < .05$ (see Figure 2).

Finally, we expected residents whose identities were most threatened by the fires to report higher levels of immediate temporal disintegration. This third hypothesis was tested by comparing the degree of temporal disintegration reported by residents who did and did not demonstrate behavior suggestive of a threatened identity. Specifically, residents' reports of what

they took with them when they left their homes during the forced evacuation were examined. Individuals who concentrated on taking items reflecting identity-related personal memorabilia (e.g., photo albums, family keepsakes; $n = 45$) reported significantly higher levels of temporal disintegration ($M = 2.59$) than individuals who reported taking practical items, such as clothing or food, or expensive material goods, such as stereos and televisions ($n = 19$; $M = 2.04$), $t(62) = 2.14$, $p < .04$.¹⁰ This difference provides tentative support for the hypothesis that a fire-related threat to residents' identities was associated with higher levels of temporal disintegration.¹¹

Discussion

Taken together, the findings from Study 3 indicate that acute, stress-related temporal disintegration is associated with the degree of past temporal orientation subsequently reported by traumatized individuals. In turn, the degree of past orientation reported is associated with distress over time, even when controlling for initial distress, age, gender, loss of one's home, degree of exposure to the fire, degree of ongoing stress, and rumination. In addition, these data suggest that residents who were most vulnerable to immediate temporal disintegration were those individuals who had experienced the most severe loss, had personally experienced chronic trauma in the past, or appeared to have experienced the fire as a threat to their personal identities. Thus, Study 3 represents the first empirical evidence linking temporal disintegration and temporal orientation with long-term adaptation to trauma. Most important, this study went beyond Studies 1 and 2 by identifying factors that may influence temporal orientation in the aftermath of trauma.

This study does not address, however, whether the tendency to have this intense, initial reaction is a predictable characteristic of one's personality or prior psychiatric disturbance. For example, it is possible that people who are depressed or high in trait-negative affectivity (cf. Watson & Clark, 1984) would experience a more intense initial reaction to the fire and end up dwelling on the negative aspects of the experience later on. However, the fact that these findings are consistent even when controlling for initial distress suggests that the results are not merely attributable to a tendency to see oneself and the world in a negative light (cf. Watson & Clark, 1984; Watson, Clark, & Carey, 1988; Watson, Clark, & Tellegen, 1988). We also note that the statistical controls for initial levels of emotional distress help to clarify the direction of the relationship between past orientation and long-term distress.

¹⁰ As some residents did not obey the orders to evacuate their residences and others were not home when the evacuation began and were thus unable to retrieve anything from them, both groups of residents were excluded from this analysis.

¹¹ A possible alternative explanation for this finding is that residents who took memorabilia when they evacuated were already past oriented before the fires. We tested this hypothesis using an item included in the initial interview that asked residents to estimate the proportion of their thoughts that were focused on the past, ranging from 0–100%. There was no significant difference between residents who took memorabilia and those who did not on the reported proportion of their thoughts that were focused on the past in the first interview.

Table 5
Results of Three Individual Regressions Predicting Changes in Psychological Distress From Immediate Temporal Disintegration and Past Temporal Orientation Six Months After the Fires

Variable	Adjusted R^2	Overall F	df	ΔR^2	$F(\Delta R^2)$	b	SE	T
Temporal disintegration	.37	4.59***	11, 55	.08	8.16***	.05	.02	2.86***
Past temporal orientation	.41	5.08***	11, 55	.10	11.38***	.05	.02	3.37***
Temporal disintegration ^a	.43	5.22***	12, 54	.03	3.87	.03	.02	1.97†

Note. These analyses controlled for age, gender, loss of one's home in the fires, degree of exposure to the fires, degree of ongoing stress, degree of rumination reported, and initial distress scores.

^a Controlling for past temporal orientation.

† $p < .06$ (marginally significant). *** $p < .001$.

Finally, these findings raise important questions about the buffering effects of acute trauma over time. Specifically, temporal disintegration scores in the immediate aftermath of the fires were lowest for individuals who had experienced acute trauma prior to the fires ($M = 2.08$), moderate for individuals who had never experienced prior trauma ($M = 2.47$), and highest for individuals who had experienced chronic trauma prior to the fires ($M = 3.18$). To the extent that temporal disintegration is linked with subsequent emotional distress, these findings offer partial support for the hypothesis that prior exposure to acute trauma may help minimize the negative effects of subsequent exposure to acute trauma (see Eysenck, 1983; Norris & Murrell, 1988; but see Wallbaum & Silver, 1998, for alternative findings). That is, *acute* prior trauma may have inoculated these residents against the negative effects of the fires (cf. Eysenck, 1983), whereas *chronic* trauma may have rendered them more vulnerable to these effects (Norris & Uhl, 1993).

General Discussion

Together, the three studies reported here suggest that when traumatized individuals become stuck in their prior traumatic

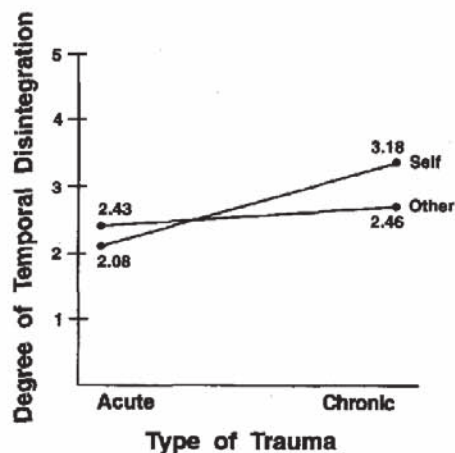


Figure 2. Mean levels of temporal disintegration for individuals who directly experienced trauma (self) versus those who were traumatized by events occurring to others (other), as a function of the type of trauma experienced, $F(1, 44) = 4.24, p < .05$.

experience, they are likely to experience elevated levels of psychological distress long after the trauma itself has passed. More important, our findings suggest that past temporal orientation makes a unique contribution to explaining long-term distress, over and above the tendency for some traumatized individuals to ruminate about their experience. In addition, individuals who are able to maintain a future orientation in the aftermath of trauma are less likely to experience high levels of psychological distress over time. Finally, individuals who report high levels of temporal disintegration in the immediate aftermath of an acute traumatic stress appear to be more focused on the past over time than those with low levels of temporal disintegration. These findings raise several questions about the general nature of temporal orientation and its role in the coping process.

The first issue involves the development and malleability of temporal orientation. Recent research suggests that infants' cognitive, emotional, physical, and social development lays the foundation for future-oriented thinking (see Haith, Benson, Roberts, & Pennington, 1994). In the context of exploring their physical and social environments, young children learn contingencies, expectation, and rudimentary planning behaviors. Over time, these experiences help create a set of basic assumptions about one's self and the world—assumptions that guide future expectations (or the lack thereof) so that individuals may function effectively in the world around them (see Bowlby, 1969; Janoff-Bulman, 1992). In essence, it is our view that temporal orientation provides organization and structure for people's views of themselves and the world. As such, temporal orientation is likely to be vulnerable to the challenging effects of highly stressful or traumatic experiences, especially when they occur early in life (see Stewart & Healy, 1989). Unfortunately, little has been done to identify how (or whether) such life experiences may precipitate changes in temporal orientation.

The second question raised by our findings involves identifying specific factors that may affect temporal orientation. For example, how are temporal processes influenced by the specific characteristics of trauma? In the present research, the relationships among temporal disintegration, past orientation, and long-term distress were investigated only in response to an *acute* form of trauma (i.e., firestorms), whereas the role of temporal disintegration in response to *chronic* forms of trauma (e.g., incest, war) remains unexplored. However, it is likely that the onset of chronic trauma mimics the experience of an acute

trauma, and initial responses to these different traumas may be very similar. Moreover, the ongoing nature of chronic trauma may produce unique changes in an individual's sense of time that are not found in response to acute trauma (cf. Herman, 1992). In research with parents whose children had been diagnosed with leukemia, parents displayed shifts in their overall temporal perspective that coincided with the progression of their child's disease—that is, they tended to prolong the present and constrict the future (Friedman et al., 1963).

When one copes with chronic trauma, these shifts in temporal perceptions are likely to be adaptive in that they may help the individual function despite the uncertainty of the future (Herman, 1992; Visotsky et al., 1961). When one copes with an acute trauma, however, continued narrowing of one's focus to the present may have limited adaptive function. It may be useful to the extent that it can help individuals identify and avoid immediate threats to their survival. However, once the acute traumatic event is over and survival is no longer an issue, narrowing one's temporal perspective to the present may be maladaptive (see Shalev, 1996).

Another important aspect of the trauma that may influence temporal processes is its recency. That is, simply distinguishing acute from chronic forms of trauma may obscure an important difference between the traumas represented in this paper: The incest and war-related experiences objectively had ended several decades prior to these studies, whereas the fires were a recent experience that had substantial ongoing sequelae for many respondents. This difference in the studies may help explain why present orientation in Study 1 was negatively associated with distress whereas in Study 3 it was positively correlated with distress. Many residents in the fire-stricken communities reported that they were still contending with the ongoing stress of cleaning up and rebuilding at the 6-month interview. For the incest survivors, however, present orientation may signify that the past is objectively and subjectively over and hence that they are no longer reliving the negative experience in their present lives.

Cognitive coping strategies may also influence temporal processes in the context of trauma. For example, suppressing thoughts about a past disturbing event may help an individual function in the present. However, thought suppression may also fragment an individual's memory for the event and disrupt the temporal ordering and sequencing of the event in memory (Wegner, Quillian, & Houston, 1996). In so doing, it may undermine the individual's ability to make sense of the experience and thereby prolong the search for meaning. Alternatively, although past temporal orientation and long-term psychological distress were positively associated in all three studies, focusing on the past in the short-term may help people cope with a traumatic experience. For instance, many cognitive responses to stress involve engaging in processes that focus the mind on the past experience, such as searching for meaning (Silver et al., 1983), mental simulation of events (Taylor & Schneider, 1989), rumination (Horowitz, 1986; Tait & Silver, 1989), and counterfactual thinking (Davis, Lehman, Wortman, Silver, & Thompson, 1995). To the extent that these processes help people "work through" and integrate the traumatic event into their worldview, they may be adaptive (Epstein, 1991; Janoff-Bulman, 1992; Silver et al., 1983). However, if these initially adaptive coping

strategies keep people focused on a distressing and seemingly unresolvable past, they appear to be detrimental for long-term adaptation (Baum et al., 1993; Silver et al., 1983). At the same time, the degree to which people can see beyond the present trauma and envision a different future (i.e., future orientation) may protect them and help them cope with the event (see Tedeschi & Calhoun, 1995).

Finally, because trauma does not occur in a cognitive vacuum, it is important to consider how social relations in the aftermath of trauma may be related to temporal processes. For example, the taboo nature of some types of trauma (e.g., incest) may inhibit discussion of the experience (see Summit, 1983) and foster ongoing intrusive thoughts about the experience (cf. Wegner, 1994). Disaster, on the other hand, is a socially shared experience that creates new social groups with which to identify. Although war is also a socially shared experience, it is not, by nature, a topic that is easily discussed with others, and this may be especially true for veterans of the Vietnam War. Nonetheless, to the extent that new trauma-related affiliations provide individuals with the opportunity to share their experience, they may facilitate coping processes. However, to the extent that new social affiliations discourage such discussion, they may hinder recovery and increase the risk that people will continue processing the experience long after it has passed (see Lepore et al., 1996; Pennebaker & Harber, 1993; Tait & Silver, 1989). As a result, the social context of a traumatic event may both facilitate movement beyond the trauma and keep traumatized people focused on their past experiences.

Conclusion

The findings reported here suggest several areas for future research when considering the role of temporal processes in coping with trauma. First, these studies cannot address whether pretrauma temporal orientation influences subsequent adaptation. For example, do future-oriented individuals generally cope better with trauma? Second, these studies do not address the nature of the relationship between cognitive coping strategies and temporal orientation over time. For example, can commonly used strategies such as rumination and searching for meaning inadvertently foster shifts in temporal orientation, as we have suggested? Third, the role of personality in the relationship between temporal processes and trauma adaptation (see Tedeschi & Calhoun, 1995) needs further exploration. Finally, systematic analysis of the relations between temporal perceptions and social interactions in the context of trauma is needed.

Nonetheless, the findings from the present set of studies suggest that temporal disintegration and orientation are important constructs underlying long-term adaptation to trauma. By focusing their mental attention on the past, people constantly reexperience a potentially painful and distressing period in their lives. To the extent that being focused on the past fosters misunderstanding or misinterpretation of current situations, it may undermine the development of appropriate responses to current social and physical environments (see, e.g., Holman & Stokols, 1994). In contrast, if individuals can learn consciously to shift attention away from potentially distressing past life events and instead to focus on current opportunities for growth and pleasure, adaptive functioning in the present may be maximized (cf. Silver et al.,

1983). As we learn more about the processes by which people get stuck in their pasts, psychologists may be able to develop ways of helping traumatized individuals reestablish an integrated, and hopefully fulfilling, view of the past, present, and future periods in their lives.

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Appendix A

Temporal Disintegration Scale

1. In the last 24 hours, how often did you feel as though you were in slow motion?
2. In the last 24 hours, how often did you feel as though time had stopped?
3. In the last 24 hours, how often did you feel as though you had no future?
4. In the last 24 hours, how often did you find yourself forgetting what just happened or feeling unclear about the order of events you just experienced?
5. In the last 24 hours, how often have you felt "caught up" in the present moment?
6. In the last 24 hours, how often were you unsure about what time or day it was?
7. In the last 24 hours, how often did you feel that nothing was real?

Appendix B

The Temporal Orientation Scale

1. I take risks that bring excitement into my life
2. I often think about how things were earlier in my life
3. I am usually certain about what I am going to do next
4. I put off small gratifications I can get now in order to try for bigger gratifications later
5. I like to be spontaneous and make decisions on the spur of the moment
6. I try to be realistic about what the future holds for me
7. I try to live one day at a time
8. Sometimes I wish I could go back to relive or change my past experience(s)
9. It's more important for me to enjoy what I am doing than it is to get things done "on time"
10. I prefer the old, familiar, and known ways of doing things to new and changing ways
11. Planning activities takes all the fun out of them
12. My plans about the future are pretty well laid out
13. My behavior seems to be more influenced by past experiences than by future goals
14. Most of my thoughts are about things that have already happened
15. I don't think much about what did or will happen, only about what is happening now

16. What I do today is focused on making tomorrow better
17. I live to experience what is, rather than worrying about what will be
18. When someone hurts or angers me, it is hard for me to forgive and forget
19. The best way to do things well is to take them as they come
20. When I want to accomplish something, I set goals and consider means for achieving them
21. How I behave today is a direct reflection of my past experiences
22. I am able to resist temptations when I know there is work to be done
23. I believe it is important to save for a rainy day
24. I often feel as though I were reliving experiences from my past
25. If I can't see the immediate benefits of doing something, I won't do it
26. I think about the future consequences of my actions
27. I often talk about my past experiences with others
28. It is best to live day-to-day and let tomorrow take care of itself

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