

2004

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North American Journal of Psychology

<http://hdl.handle.net/11728/6299>

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September 11: Immediate and Long Term Effects on Measures of Aggression, Prejudice, and Person Perception

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Tests of aggression, prejudice and a measure of how much uniqueness or similarity we perceive in others were administered to participants the day before the terrorist attacks of 9/11, the day of the attacks, six and seven days later, one month later, one year later, and two years later. Results show that aggression scores went up on 9/11, abated somewhat, then went back up a year later, but were not as high two years later. The prejudice scores showed no consistent change, but scores on the perception of similarity in other people by participants decreased over the two year time span. These measured dimensions are compared to "clinical" responses to trauma, such as stress and anxiety. The authors also discuss anniversary reactions to trauma, and the role of the media in spreading the effects of trauma to those not in close proximity to the event.

A number of reports have been published about the terrorist events of September 11, 2001. Many of these have focused on people who were directly involved. Dimen (2002), Strozier (2002) and others have described the responses of survivors and eye witnesses as well as therapy efforts for these individuals. Gonzalez-Dolginko (2002) has described using art therapy for students whose school was nearby, and Boscarino, Galea, Ahern, Resnick and Vlahov (2002) have reported increased utilization of mental health services in Manhattan following the attacks. Silver, Holman, McIntosh, Poulin, & Gil-Rivas (2002) have reported significant percentages of stress reactions in a web-based survey.

Numerous other discussions and research reports, however, have addressed the issue of possible effects from the attacks on groups or individuals who were not directly involved. For example, Argyrides, Downey, and Huff (2002) reported an increase in aggression scores from September 10th to September 11th for a sample of college students in Alabama, and argued that behavioral and attitudinal changes of a "non-

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North American Journal of Psychology, 2004, Vol. 6, No. 1, 175-188.

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clinical" nature (such as aggression and prejudice) should be expected to change in large segments of the population. They suggested that aside from the recognized "clinical" problems such as post traumatic stress syndrome (Brewin, Andrews, Rose, & Kirk, 1999; Wilson, Harel, & Kahana, 1988) associated with wars and other catastrophic events, a number of factors could combine to produce significant changes in many measurable psychological attributes of the population. Specifically regarding aggression, these authors pointed out that (1) the "direct provocational" nature of the attacks (Baron & Richardson, 1994; Geen, 1997); (2) the perception of the attacks as unjust (Dill & Anderson, 1995); (3) the unexpected nature of the attacks (Kulik & Brown, 1979); and (4) the observation of the violence (especially on TV) (Archer & Gartner, 1976; Eron, Gentry, & Schlege, 1994; Geen & Thomas, 1986; Paik & Comstock, 1994) all point to a possible increase in aggression following the attacks of September 11, 2001. Argyrides and Downey (2002) also argued that prejudice scores should increase after the attacks, since the terrorists were from a foreign country, practiced a different religion, and represented many cultural practices and values unfamiliar to most Americans. "Us vs. them" categorizations are well known precursors to prejudice (Brewer & Brown, 1998; Hartstone & Augaustinos, 1995). Additionally, they speculated that people might change how much similarity versus uniqueness they perceive in others following such an attack. They argued that the perception of others as "similar to each other" could decrease as the population became more aware of cultural and religious differences between themselves and the terrorists, and as such differences became more salient due to continuing coverage of the conflict in the Middle East.

Using a somewhat different approach to considering the public's response to a terrorist attack, Volkan (2002) has suggested that a group regression takes place. This concept is very similar to the classic regression work by Kurt Lewin and his associates (Barker, Dembo & Lewin, 1941). Lewin defined regression as a "primitivization of behavior, a going back to a less mature way of behaving," (p.1) and argued that a temporary regression was common in intense emotional situations. For both Volkan and Lewin, aggression and anxiety would play a large role in response to terrorism as major components of regression.

The forgoing kind of speculation and research suggests four questions. First, what kind of effects, if any, has the terrorist attack of 9/11 had on populations that were not directly linked to the event; second, for how long do such possible effects last; third, what role do television and other media play in the initiation of these possible effects; and fourth, also related to the media, what role do newspapers, TV, and

other information sources play in the possible re-creation of emotional, attitudinal, or behavioral effects on the occasion of anniversaries. That is, does the media's focus every year on the anniversary of 9/11 result in the re-institution of unwanted responses that may have decreased or even disappeared over time.

Considering these four questions one at a time, there are a number of studies indicating that distant populations are likely to be affected, including the previously cited national sample data of Silver, et al. (2002). Greenberg, Schimmel, Martens, Solomon, and Pyszczynski (2001) noted a change in racism among "non-victims," and in a national sample, Schuster, et al. (2001) reported increased levels of communicating, turning to religion, participating in group functions, and making donations. Franklin, Young, and Zimmerman (2002) found that psychiatric patients not directly impacted were nonetheless at increased risk for experiencing distressing symptoms, and Chanley (2002) found that trust in the national government went up following 9/11 among "non-victim" groups. In fact, Apolone, Masconi, and LaVecchia (2002) reported a depression in mental health scores in Italy following the attacks in New York and Washington, D.C.

The question of how long such effects are likely to last is not as easily answered. Argyrides, Downey, Mikula, & Moody (2003) have reported that aggression levels appeared to be elevated for at least a year, and (Schlenger, et al., 2002), in surveys taken one month and two months after the attacks, reported high nonspecific stress as well as post traumatic stress syndrome. Miller (2002) has also offered evidence of effects one year after 9/11. In a previous act of terrorism, students in Oklahoma City were surveyed seven weeks following the Oklahoma City bombing and were still showing obvious stress-related behaviors (Pfefferbaum, et al., 2001). Thus, some evidence exists that both clinical and attitudinal changes may last a year or more.

The role of the media appears logically obvious and also is well demonstrated. Duggal, Berezkin and John (2002) relate the story of an 11-year-old boy who developed PTSD and major depression after watching the attacks on the World Trade Center on TV. The child was in Pittsburgh. Pfefferbaum, et al. (2001) found TV exposure directly related to stress symptoms in Oklahoma children seven weeks after the Oklahoma City bombing, whether or not they were close to the actual bombing, and Schlenger, et al. (2002) reported a significant correlation for adults in various parts of the country following the attacks, between the amount of time spent viewing TV and symptoms of stress. While these studies and others refer primarily to stress related symptoms, the role of the media in increasing levels of aggression, and even crime, is well known (Archer & Gartner, 1976; Berkowitz, 1984; Geen, 1998;

Huesmann & Eron, 1986). In general, few doubt the effective role of the media in changing attitudes and behaviors that are not stress related (Cialdini, 2001; Pratkanis & Aronson, 2001).

The question of anniversary reactions is not so easily answered. The re-experiencing of a traumatic event (flashbacks), sometimes linked to an anniversary type reaction, is recognized as a possible symptom of post traumatic stress syndrome (American Psychiatric Association, 2002). However the possibility of such an occurrence with other, non-anxiety, attitudinal or behavioral responses is not well documented.

Downey (1972) has argued that being reminded of an angering incident or stimulus could serve to re-establish anger and perhaps aggression that had abated. The reminder could lead to cognitive rehearsal, arousal, and subsequently could re-instate high levels of aggression. Further, Argyrides, et al. (2003) have reported that aggression scores which seemed to have decreased somewhat in the month following September 11, 2001 were back up in September, 2002. There is some evidence, then, in support of the anniversary reaction outcome in at least one attitudinal dimension.

Thus it seems safe to conclude that disasters such as the terrorist attacks of 9/11 have damaging effects such as stress, anxiety, PTSD, and also effects that are less obvious and appear more "non-clinical," such as attitudinal or behavioral changes. It is equally clear that these effects are not limited to people or groups that are victims, but that are demonstrable around the whole nation, and indeed the whole world. Also, studies such as these leave little doubt that watching the terrorist violence on television, or seeing images on the internet or in newspapers, is likely to cause stress and attitudinal, perceptual, or behavioral changes in much the same way for the general population as it does for surviving victims, eye witnesses, or others who are directly linked in some manner. Finally, some evidence supports the notion that media attention to anniversaries may lead to strengthening certain responses to terrorism that had dissipated to some degree.

The present report is an exploratory follow up and an addition to data presented by Argyrides and Downey (2003). It is hoped that further information will be obtained, primarily regarding the question of how long effects from terrorist attacks might last, and whether anniversary reactions may occur. It was hypothesized that: (1) aggression and prejudice scores would increase after 9/11; (2) the perception of others as similar to each other would decrease after 9/11; and (3) an "anniversary reaction" will occur around 9/11 in later years as the media re-visits the attack.

METHOD

Participants

Participants were 243 volunteers from psychology classes at the University of South Alabama. They were given extra credit for participating and the mean age was 20.6. In all testing sessions, participants were 60% female, 40% male and approximately 90% white.

Materials

The aggression measure used was a revision of the *Buss-Durkee Hostility Inventory*, revised by Buss and Perry (1992). It is a 29-item measure with a reported reliability of .80.

Prejudice was assessed by the *Modern Racism Scale* by McConahay (1986) with reported reliability coefficients ranging from .72 to .93.

The 16-item *People Perspective Questionnaire* (PPQ) was developed by Argyrides and Downey (2001). It was constructed to assess the degree to which individuals perceive others to be "similar to each other" versus very different from each other, or unique. The questionnaire has a reported reliability alpha of .86.

Procedure

The testing took place in a group setting. Participants were assured of the confidentiality and anonymity of their answers and were asked to please read the questions carefully and answer honestly. Testing took place on seven different days. Session one, September 10, 2001; as part of another study, participants responded to numerous tests and questionnaires including aggression, prejudice, and person perception questionnaires ($n = 30$).

Session two, September 11, 2001; the aggression, prejudice, and person perception questionnaires were chosen as measures that could be affected by the terrorist attacks of that morning, and therefore were administered in the afternoon to a new sample ($n = 34$). Sessions three and four, September 17th and 18th, 2001; one week after the 10th and one week after the 11th, the tests were repeated to see if any changes were occurring ($n = 30, 32$).

Session five, October 11, 2001; testing was repeated one month after 9/11 ($n = 32$). Session six, September 11, 2002; testing was repeated to assess any changes one year after 9/11 ($n = 45$).

Session seven, September 4, 2003; the final testing session was held to see if the measures changed two years after 9/11, 2001 ($n = 40$).

RESULTS

Analysis of variance indicates that aggression scores did differ as a function of the day of testing ($F_{(6,236)} = 2.94, p < .01$). Scores may be seen

in Table 1. Post hoc tests (Tukey HSD) show that scores on September 11, 2001 ($M = 83.12$, $SD = 24.05$) and scores on September 11, 2002 ($M = 79.42$, $SD = 16.57$) were significantly higher than the scores obtained on September 10, 2001 ($M = 65.77$, $SD = 14.40$). As shown in Table 1, the means for the remaining test dates were intermediate and not different from any others.

TABLE 1 Test Dates and Mean Scores for Aggression.

Test Date	Mean	Std. Deviation	N
Sept. 10	65.77*	14.39	30
Sept. 11	83.12	24.05	34
Sept. 17	72.73	17.72	30
Sept. 18	76.69	19.54	32
Oct. 11	74.25	19.39	32
Sept. 2002	79.42	16.57	45
Sept. 2003	73.20	16.76	40
Total	75.36	18.94	243

*Lower than Sept. 11 and Sept. 2002, $p < .01$.

The prejudice scores were analyzed by ANOVA and indicated that the mean scores differed only between September 11, 2001 ($M = 20.65$, $SD = 7.91$) and October 11, 2001 ($M = 16.19$, $SD = 4.80$, $F_{(6,236)} = 2.44$, $p < .03$). None of the means for other test days differed from any others (see Table 2).

TABLE 2 Test Dates and Mean Scores for Prejudice

Test Date	Mean	Std. Deviation	N
Sept. 10	17.53	4.67	30
Sept. 11	20.65*	7.91	34
Sept. 17	18.20	4.58	30
Sept. 18	19.61	5.79	32
Oct. 11	16.19	4.80	32
Sept. 2002	19.68	5.15	45
Sept. 2003	19.81	6.46	40
Total	18.92	5.87	243

*Higher than Oct. 11, $p < .03$.

Scores on the measure of how similar participants perceived others to be (*People Perspective Questionnaire* or PPQ) also differed by day of testing ($F_{(6,234)} = 3.52, p < .002$) (see Table 3). Post hoc analysis (Tukey HSD) indicates that scores on September 4, 2003 ($M = 54.16, SD = 12.71$) are lower (people are seen as less similar to each other) than scores on September 11th, 2001 ($M = 64.66, SD = 19.57$) and those of September 18th, 2001 ($M = 66.86, SD = 14.66$).

The mean of the scores ($M = 55.68, SD = 16.49$) for September 11, 2002 is also significantly lower than the mean of September 18, 2001.

TABLE 3 Test Dates and Mean Scores for the Perception of Similarity in Others (PPQ).

Test Date	Mean	Std. Deviation	N
Sept. 10	62.40	15.23	30
Sept. 11	64.66	19.57	34
Sept. 17	63.07	11.68	30
Sept. 18	66.86	14.66	32
Oct. 11	60.79	11.30	32
Sept. 2002	55.68*	16.48	45
Sept. 2003	54.16**	12.71	38
Total	60.60	15.35	241

*Lower than Sept. 18, $p < .02$.

**Lower than Sept. 11 and Sept. 18, $p < .02$.

Note: Portions of these data have been presented at the Southeastern Psychology Association Meeting (2002) and the American Psychological Association Meeting (2003).

DISCUSSION

These test results suggest that there were attitudinal and perceptual changes in the general population following the terrorist attacks of September 11, 2001. The aggression measure showed a significant increase the afternoon of the attacks. After abating somewhat a week later and a month later, the scores were higher again on September 11th of 2002. It seems plausible that aggression may have increased in response to the attack, dissipated somewhat with time, but was reinstated a year later in response to "anniversary" attention from the media, and perhaps personal memories. Two years later (September 4, 2003) the aggression scores were at the intermediate level of one week and one month after 9/11, and had not returned to the higher levels of 9/11, 2001 and 9/11, 2002. It is possible that the passage of another year resulted in further dissipation of the aggression arousal. However, it may also be possible

that the barrage of media attention regarding the anniversary of the attacks had not yet begun on September 4th (a week before the 11th) when the most recent data was collected.

The only difference in the prejudice measure for the seven measurement times was between the highest mean of September 11, 2001 and the lowest mean of October 11, one month later. Thus, while the highest scores were found on the day of the attacks, they were not significantly different from the scores of September 10th. One might speculate that prejudices of various kinds may have changed, but the measure used in this study (*Modern Racism Scale*, McConahay, 1986) is focused directly on racial prejudices within one's community (not international) and primarily toward African Americans (not Middle Eastern populations). Therefore, it is quite possible that the test used was simply not a good measure of any potential prejudice changes following 9/11. On the other hand, one could argue for a possible decrease in prejudice levels due to the fact of sharing a common enemy and the perception that "we're all in this together". This attitude may account, in part at least, for the surge in patriotic flag displays following the attacks.

Greenberg, et al. (2001) offer evidence that reminding people of their own mortality, for example in the form of a terrorist attack, may lead to greater tolerance for racism by members of their own group. However, it would appear that the group with which one identifies is certainly subject to change. For example, following a terrorist attack one's "group" could possibly change from friends, to state, to race, or to nation. Therefore, predictions of prejudice, or tolerance for prejudice, would be problematic, perhaps dependent on the particular group identification of the individuals involved. One possible result could be less prejudice regarding one's identified group and, at the same time, more prejudice directed at certain out groups. Pyszczynski, Solomon, and Greenberg (2002) have made a related suggestion, arguing that a fear of terrorism will motivate people to support their own culture or group, and to become more hostile to those who are different.

The person perception variable was predicted to change after the attacks (Argyrides, et al., 2002) in the direction of people reporting more dissimilarity among others than before. It was felt that the terrorist action would lead to an increased awareness of differences between people (cultural and religious, for example) and therefore a lower score on the PPQ. This hypothesis appears to have been partially supported, since the scores were indeed lower on September 4th, 2003 than on September 11th and 18th of 2001, and September of 2002 scores were lower than those reported on September 18, 2001. A possible interpretation of these results is that the immediate reaction of participants on September 11, 2001 was a primarily a more visceral affective response (higher aggression scores)

but the change in how participants' perceived similarities among others was a more cognitive response involving the processing of piecemeal information over time. Thus, one and two years after the attacks, people may have developed different perceptions, or perhaps new schemas with regard to how similar to each other or how different from each other that we perceive others to be.

The present results appear to support previously cited evidence that attitudinal and perceptual changes are likely following catastrophic events such as wars or terrorist attacks. Such changes appear to be discriminably different from the oft-cited "clinical" symptoms such as anxiety, fear, and post traumatic stress syndrome. Interestingly, recent research regarding these anxiety-related problems (Boscarino, et al., 2002; Norris, et al., 2000; Silver, et al., 2002) suggests that young persons, women, and those with secondary stressors or previous psychiatric problems are more likely to suffer such problems following trauma. Therefore, one might ask whether these or a different set of "risk" factors may predict "non-clinical" attitudinal, or other post trauma changes.

The present results also add weight to the existing evidence that people anywhere in the country (possibly the world) are likely to be affected by events such as terrorist attacks. Perhaps exhaustive, intensive, and relentless media coverage helps to make "victims" of us all.

One might ask, more specifically, if there is a correlation between impact and distance from an attack. While the evidence seems clear that people in all corners of the United States have felt some impact from the attacks, were those farther away in physical distance affected less? Galea, et al. (2002) found a distance relationship within the city of New York, in that persons interviewed who had been closer to the actual attacks reported more stress symptoms than those who had been a little farther away. The questions remain as to whether 500 miles away is an area of greater impact than 1,000 miles away, and whether attitudinal or other changes will also be related to distance. One might speculate that a greater distance, less impact relationship might hold for "clinical" responses such as anxiety, but perhaps not for attitudinal responses.

The third question raised earlier about how long any effects might persist remains unanswered since some changes (aggression) may have dissipated somewhat, while others (our perception of other's similarity) may be still changing. It seems quite likely that events such as 9/11 become an instigation, along with an array of other variables, to changes in people that are permanent, and some of which are as yet unidentified.

It appears that the media, while performing an informational role, may be a significant contributor to both "clinical" and attitudinal effects

resulting from catastrophes, and also may re-institute certain of these effects through focusing on the anniversary of a catastrophe every year.

An interesting question exists with regard to the anniversary reaction possibility. The controversial issue of "debriefing" victims after a traumatic event and the therapeutic practice of coaxing trauma victims to "re-live" the experience (Foa, Dancu, Hembree, Jaycox, Meadows, & Street, 1999) appear derivable from psychoanalytic ideas about catharsis. That is, talking about, or re-experiencing an event supposedly "gets out" unconscious or unresolved conflicts or stress. Of course, another possible explanation for any desired outcomes of this "getting out" process is that desensitization or habituation may take place. On the other hand, if anniversary reactions take place, then one could predict that thinking, talking about, and "re-living" traumatic events would delay or even prevent healing processes. Thus, a reminder, or the re-living of an experience may be viewed as both a symptom and a therapeutic process. This apparent theoretical conflict should be a focus of increased attention in future research.

Since the present data were collected over the span of two years, one must be cautious in attempting to identify causal variables. Other events have occurred over the course of those two years, some of which may have pushed results in the direction obtained in the present study. Further, the sample sizes at each test date were relatively small, which also points to cautious interpretation (Since we were unable to enlarge the first serendipitous sample on September 10, 2001, we saw no great advantage in using larger samples at later dates.). Finally, future research in this area should attempt a more complete assessment of any variables of interest.

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