

Effects on Volunteering of the September 11, 2001, Attacks: An Archival Analysis¹

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Data from a national online organization that matches volunteers with service organizations places volunteers were analyzed to answer questions regarding the impact of the September 11, 2001, attacks on volunteering in the United States. Results showed that: (a) following September 11, there was a dramatic increase in the number of people who offered to volunteering, and the increase lasted for about 3 weeks; (b) the greatest increase in volunteering occurred for crisis-related organizations, but volunteering increased significantly for all kinds of charities and service organizations; and (c) the demographic correlates of volunteering changed little in the wake of the attacks. The results are discussed in the context of psychological theories of the factors that motivate prosocial actions.

The attacks on the World Trade Center and the Pentagon on September 11, 2001, generally are viewed as an event without precedent in American history. However, among psychologists, there has been relatively little systematic research on the impact of these events on social behaviors (for an important exception, see Pyszczynski, Solomon, & Greenberg, 2002). The present article focuses on prosocial behaviors in the aftermath of September 11.

As was widely reported in the media, huge sums of money (more than \$1.4 billion; “9/11 by the Numbers,” September 16, 2002) were donated to the victims of the attacks and their families. But the phenomenon of interest here is another kind of prosocial reaction to the attacks: the expenditure of time and effort for the

¹The authors are extremely grateful to Lila Musser and Jason Willet of VolunteerMatch for providing us with the data reported in this article. The views expressed are those of the authors and do not reflect those of VolunteerMatch. We also appreciate Joseph Vandello’s thoughtful comments on an earlier draft of this manuscript. Finally, the first author thanks the Research Center for Group Dynamics at the Institute for Social Research, University of Michigan for its support in the preparation of this manuscript.

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purpose of improving the well-being of others. The core issue addressed by this article is as follows: How did the events of September 11 affect Americans' willingness to engage in such prosocial actions?

To answer this question in a meaningful way, we must first differentiate among the various kinds of prosocial behaviors in which people engage. One widely used method is to consider the thought and planning that precede such behavior (Omoto & Snyder, 1995; Pearce & Amato, 1980; Penner, 2002). Acts of helping differ, for example, in the extent to which they are spontaneous and informal versus planned and formal.

It seems reasonable to expect that spontaneous and informal kinds of helping would have increased dramatically in the days immediately following September 11. Indeed, media reports suggest that it did (e.g., "*America Unites*," October 1, 2001). It appears that two kinds of spontaneous, informal helping were prevalent in the days immediately following the attacks. The first could be called intimate helping; that is, physical and psychological aid provided by people with close personal relationships to the victims of the attacks and their families. There was also apparently a substantial increase in what the research literature calls bystander interventions by strangers (Dovidio & Penner, 2001; Dovidio, Piliavin, Gaertner, Schroeder, & Clark, 1991; Schroeder, Penner, Dovidio, & Piliavin, 1995). That is, in the aftermath of the attacks, large numbers of bystanders unrelated to the victims of the attacks or the professional rescue workers witnessed their circumstances and came forward to offer immediate, direct aid.

There is also reason to believe that planned and formal helping increased as a result of the events of September 11. One form of this was the aid provided to the victims (and their relatives) by professional public-safety personnel in the areas directly affected by the attacks. To be sure, in the minutes and hours immediately after the planes struck the buildings, many police- and fire-department personnel spontaneously and courageously helped the victims of these attacks. As time wore on, however, the behavior of individuals in protective occupations seems to have become more planned, formal, and consistent with their occupational roles and norms.

Another kind of planned and formal helping, and the focus of this article, is volunteerism. Volunteerism can be defined as long term, planned prosocial behaviors that benefit strangers and that usually occur within an organizational setting (Penner, 2002). As this conceptual definition suggests, volunteerism is more planned, thoughtful, and organized than intimate helping or bystander interventions, but there are also other differences between it and these two other kinds of informal helping. One of the most important of these differences is the helper's relationship with the target. Even in bystander interventions by strangers, there is usually some degree of interpersonal contact between the helper and the person in need, but a volunteer may never see or even know the person or persons that his or her actions benefit.

Thus, as Omoto and Snyder (1995) pointed out, the volunteer typically is not motivated by a sense of personal obligation to some specific individual, such as a relative, a close friend, or a stranger in dire need. Indeed, in volunteering, the direct target of the behavior is most commonly an organization that aids some group or facilitates some goal, rather than helping a specific person or persons. Consistent with this, volunteering seems to be most commonly motivated (at least initially) by concerns about some group or community need (Omoto & Snyder, 2002; Penner & Finkelstein, 1998).

The motives that underlie volunteering also serve to distinguish it from the professional helping discussed earlier. That is, although the volunteer and the professional helper both usually work in an organizational context and make a long-term commitment to this activity (Independent Sector, 1999; Penner & Finkelstein, 1998; VolunteerMatch, personal communication, September 15, 2001), typically there are no tangible or material rewards for being a volunteer. The professional helper, by contrast, is paid for his or her activities. (Although, obviously, professional helpers often are motivated by more than just receiving a paycheck.)

Volunteering is a rather common form of prosocial behavior in many Western industrialized countries (Curtis, Edward, & Baer, 1992). For example, in 2000, a national survey of Americans 18 years of age and older found that about 44% of those surveyed reported they spent at least a few hours a week working as an unpaid volunteer for some service organization (Independent Sector, 2001). In the United Kingdom, a 1997 national survey of the same age group put the percentage of people who volunteered weekly at 48% (National Centre for Volunteering, 2002). In a national survey in Canada, 27% of Canadians over the age of 15 years reported they were active volunteers (Statistics Canada, 2001).

This brings us back to the specific focus of this investigation: How was volunteering affected by the September 11 attacks? We are not aware of any systematic efforts to answer this question empirically. There were media reports of dramatic increases in volunteerism, but these reports were based largely on anecdotal information provided by various service organizations (e.g., Copeland, 2001; Miller, 2002).

Independent Sector (2001) conducted a national survey entitled "Charitable Giving After September 11, 2001," but did not include any questions specifically concerned with volunteerism. We were able to address this question because we were given access to the database of a national organization (VolunteerMatch) that uses the Internet to connect volunteers with service organizations.³ Specifically, we obtained daily frequency data on the number of people who went to VolunteerMatch's website, identified a specific charity or service organization, and then sent an e-mail to that service organizationem indicating they were

³VolunteerMatch issued a press release, based on data from their database, in which they reported a dramatic increase in volunteering after September 11, 2001.

interested in volunteering for them. We shall refer to this as volunteering or volunteer rates; although, as will be discussed later, we have no way of knowing how many of the people who contacted an organization through the website actually volunteered. It must be emphasized, however, that the data analyzed here were not simply "hits" on the VolunteerMatch website.

Obviously, we had no way of knowing that the September 11 attacks were going to occur, and we had to spend considerable time examining the VolunteerMatch database before we decided what questions about volunteering we would be able to ask and to answer. Thus, it would be disingenuous (or worse) for us to present a set of hypotheses as if they were formulated without already knowing something about what we would find. Therefore, although the remainder of the discussion is organized around three questions and some predicted answers to them, this is primarily an organizational tool. In fact, a few of the predictions were informed by what we found in our preliminary inspections of the data.

Research Question 1. What was the impact of the attacks on the rate of volunteering in the United States? Did volunteering increase, and if it increased, how long did this last?

We expected that (a) volunteering increased in the aftermath of the September 2001 attacks, but that (b) this increase was relatively short-lived. In this article, we discuss some of the specific theories and findings that led us to these predictions. The first of these concerns the modeling of prosocial behaviors.

In the days that immediately followed the attacks, the print and electronic media presented numerous examples of heroic and selfless acts intended to help the victims and their families. There is a substantial literature to suggest that exposure to models in the mass media results in a change in behavior among observers (Bandura, 2001). Although psychological research has focused primarily on the effects of modeling on antisocial actions (e.g., aggression; Bushman & Anderson, 2001; Phillips, 1985; Yukawa & Yoshida, 1999), there is also a literature that suggests media models can affect prosocial actions as well (Schroeder et al., 1995). Most of this research has been conducted with children (e.g., Hearold, 1986), but there are also studies that have shown prosocial modeling effects with adults. For example, Penner and Fritzsche (1993) found that "Magic" Johnson's altruistic public statements following the disclosure that he was HIV positive resulted in significant increases in college students' willingness to help a person they believed to have AIDS.

A second reason for expecting an increase comes from work on the effects of common external threats on people's sense of community and how they perceive who is a member of their in-group. Although the attacks took place in the northeastern United States, the targeted group did not appear to be some specific ethnic, religious, or regional group, but rather, in most people's views, it was the

American people. Research done over 40 years ago suggests that a shared common external threat will, at least initially, increase a sense of community among the targets of the threat and will diminish the divisions among groups within the targeted community (e.g., Burnstein & McRae, 1962; Feshbach & Singer, 1957; Sherif, 1958).

The results of a poll conducted in New York City in 2002 are consistent with these earlier findings. Specifically Black, Hispanic, and White New Yorkers all agreed that ethnic relations in the city had improved substantially since September 2001 (Murphy & Halbfinger, 2002). Thus, to the extent that the attacks created an increased sense of community and in-group solidarity among a large segment of the American population, one would expect volunteerism to increase in the aftermath of those attacks. That is, as suggested earlier, volunteerism is often motivated by a sense of community (Omoto & Snyder, 2002), and people who identify with their community are more likely to work toward the common good (Van Vugt, 2001).

Another theory that would predict increased volunteering after the attacks is Lerner's (1998) just-world theory, which posits that people see the world fundamentally as a fair and just place, where the good are rewarded and the bad are punished. When violations of this assumption occur, people act in various ways to restore a just world. The deaths of over 3,000 innocent victims on September 11 was almost certainly seen by most Americans as an instance of an unjust world, and volunteering to help others would be one possible way of trying to reestablish a just world.

Terror management theory (TMT; Greenberg, Solomon, & Pyszczynski, 1997; Pyszczynski et al., 2002) would also predict an increase in volunteerism, but for reasons quite different from just-world theory (Lerner, 1997). One of the relatively pervasive psychological reactions to the attacks was a sense of fear and uncertainty about the future. For example, Pyszczynski et al. (2002) reported that, "In November 2001, 40% of all Americans believed that they or a family member will be the victim of a future terrorist attack; and 74% said they believed such an attack was quite likely in the near future" (p. 3). TMT would argue that this sense of vulnerability and fear of death would cause people to engage in actions intended to reduce their anxiety about their own mortality. One such tactic strategy to do this means of doing this is acting in ways that attempt to increase one's self-esteem and feelings that one is valued by society (Greenberg et al., 1997). It seems reasonable that prosocial actions would be a way to achieve that end. And indeed, a recent study by Jonas, Schimel, Greenberg, and Pyszczynski (2002) supports such a proposal. Specifically, Jonas et al. found that when participants' mortality was made salient, they gave more money to charity than did people in a control condition. Extrapolating from these specific findings and the other research reviewed, we would expect an increase in interest in volunteering after the attacks of September 11.

What is less clear is how long this increase will last. Penner and Fritzsche (1993) found that the impact of “Magic” Johnson’s statements persisted for more than 2 months, but this is not the typical finding and may have been a result of the continued positive publicity Mr. Johnson received in the area in which the study was done. Most studies of the effects of media models find that such effects are relatively short lived (Brown & Potosky, 1990; Phillips, 1985; Sorrentino, Vidmar, & Goodstadt, 1974). However, the September 11 attacks were without precedent in recent American history, and, in contrast to the circumstances surrounding these earlier studies, there were numerous independent attempts to sustain any increases in volunteerism that might have occurred. For example, volunteering was explicitly and widely encouraged by public officials (including President Bush in a nationally televised speech on November 8, 2001) and by the media in the weeks that followed the attacks.

Research Question 2. Was volunteering for certain charities differentially affected by the attacks?

It seems likely that volunteering for the charities most readily connected to the needs created by the attacks (e.g., crisis-related charities) would have increased dramatically, but predictions about charities whose activities were only loosely related or totally unrelated to the attacks are less obvious. One possibility is that an increase in volunteering for the former kinds of charities occurred at the expense of volunteering for the latter group of charities. Thus, we might expect a decrease in volunteering for charities whose activities were unrelated to the attacks. Such an expectation would be consistent with anecdotal reports that charitable donations to those service organizations that most directly served the victims of the attacks and their families (e.g., the Red Cross’s Liberty Fund and the United Way’s September 11 Fund) increased at the expense of other organizations with less obvious connections to the attacks. The VolunteerMatch database contains data on volunteering for 27 kinds of charities/service organizations, which are differentiated on the basis of the target or focus of an organization’s activities (e.g., animals, children, education and literacy, health and medicine, politics, women). Thus, it was possible to divide these organizations into crisis-related and non-crisis-related ones and to compare them in terms of the relative changes in volunteer signups before and after September 11.

Within the non-crisis-related charities, we also examined the relative rates of volunteering for charities that served different target populations. The question of interest was whether certain specific kinds of charities experienced a decrease in volunteering after September 11. The rationale for asking this question follows. Although volunteering and service organizations are generally valued in the United States, this is not necessarily true for some specific kinds of volunteers/organizations. For example, Snyder, Omoto, and Crain (1999) suggested that

certain charities (e.g., AIDS service organizations) may actually elicit negative reactions because the people served by the organizations are somehow stigmatized or considered members of out-groups (e.g., homosexuals, immigrants).

As noted, the September 11 attacks probably increased mortality salience among a large number of U.S. citizens. And also as noted, Greenberg and his colleagues (e.g., Greenberg, Pyszczynski, Solomon, & Rosenblatt, 1990; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989) have found that when people's mortality is made salient to them, they are likely to engage in more moralistic behaviors and to be especially punitive toward people or groups that violate cultural norms or the person's worldview. Extrapolating from these findings, interest in joining organizations that served stigmatized groups could have declined after the attacks. Jonas et al.'s (2002) findings are consistent with such a conjecture. They found that mortality salience increased contributions by their American subjects only when the charity would benefit other Americans; mortality salience did not increase donations to a charity that benefited an international cause.

On the other hand, it also was possible that the attacks created a heightened sense of concern and community among the typical supporters of the different causes represented by the various organizations, and thus increased their willingness to volunteer to work for them (Omoto & Snyder, 2002). Thus, volunteering would have increased for all charities. Such increases would be consistent with predictions derived from other theories as well. For example, if people were motivated to restore a just world, this would probably increase helping for all groups, not just the ones directly related to the tragedy. Also, it is fairly well established that helping can serve to reduce negative affect among helpers (Schroeder et al., 1995). To the extent that people's affective states were negatively affected by the attacks, volunteering for one's favorite charity might have provided a psychological benefit for many people.

Research Question 3. What demographic characteristics were associated with volunteering after the attacks?

There is a fairly extensive and consistent set of findings on the demographic correlates of volunteering. Studies conducted in North America and the United Kingdom find that individuals are more likely to volunteer and to be more active once they begin to volunteer if they are wealthy, better educated, more religious, and have a history of donating money to charity (Statistics Canada, 2001; Independent Sector, 1999; National Centre for Volunteering, 2002; Penner, 2002; Schroeder et al., 1995).

In the present study, the question was whether these relationships would still be found after September 11, 2001. Why might they change? One possibility is that the enormous impact of this situational variable served to eliminate the

influence of personal characteristics on volunteering. It is also possible the nature of the attacks brought new variables into the equation. For example, attacks were widely perceived as an "attack on America," which might have made variables related to patriotism and citizenship better predictors of volunteerism than the demographic variables presented in the previous paragraph. To address these issues, we used data, aggregated at the state level, to examine relationships between selected variables and volunteerism before and after September 11.

Method

Participants

The original participants were 605,454 people who selected a charity or service organization through the VolunteerMatch website (<http://www.volunteermatch.org/>) from August 7, 1997, through December 31, 2001, and indicated that they wanted to work as volunteers. No information about the attributes of individual volunteers was available. Rather, the database contains aggregated information about the day on which people offered to volunteer, the kind of charity or service organization for which they wished to work, and the state in which they lived.

Volunteering Through VolunteerMatch

VolunteerMatch is a private, nonprofit organization located in San Francisco, California. VolunteerMatch launched its website in August 1997. When people go to the website, they are asked first to provide their ZIP code. This takes them to a new screen in which they are presented with a dropdown menu with 27 entries that generally describe the primary purpose or targets of the organizations contained in each entry. Examples of the entries include animals; children and youth; crisis support; disabled; emergency and safety; gay, lesbian, and bisexuals; health and medicine; immigrants and refugees; seniors; and women.⁴

The person selects one of the entries and then is provided with fairly detailed information about specific charitable or service organizations that fall into the selected group and that are located in or near the area covered by his or her ZIP code. Once a specific organization is selected, the person receives a template for his or her e-mail address. If the person is interested in volunteering, he or she clicks on "Send" and his or her name and e-mail address are sent directly to the organization. Also, if the person agrees (by checking a box), his or her name is listed on the website as someone who is interested in volunteering for this

⁴At the time this study was conducted, there were over 20,000 organizations listed on the VolunteerMatch website.

organization. VolunteerMatch records this information in their database and sends another, separate message to the organization informing them that this person is interested in volunteering for them.⁵

Data Preparation

Volunteering rates. The first set of analyses focused on the number of people who offered to volunteer before and after the attacks. Spreadsheets provided to us by VolunteerMatch contained daily totals of the number of people who had contacted an organization and expressed a desire to volunteer from August 7, 1997, through December 31, 2001. A careful examination of the spreadsheets shows that in 1997, there was a substantial number of consecutive days that contained no entries, as well as other anomalies in the daily data. These probably reflect the fact that in 1997 the website was still in its early stages and was not working properly on a consistent basis. Therefore, we decided to exclude all but 4 days of the 1997 data and to focus on the remaining 4 years.

Weekly totals were computed by summing daily totals. The weekly rates were analyzed to answer the main study questions. Therefore, it was important to estimate the reliability of the data that made up the weekly totals. To do this, each week was treated as if it were a seven-item scale (i.e., the 7 days in the week) and the daily totals were responses to the items in the scale. Then a coefficient alpha was computed for each year, with the *ns* being the number of weeks in each year. Across the 4 years, the lowest coefficient alpha was .93, indicating very high internal consistency among the daily totals within the weeks. Thus, it was reasonable to use weekly totals as the unit of analysis.

To make the weekly totals comparable across years, we began every week in the analyses with the same day. Because the first day of 1998 was a Thursday, we actually began this week with the last Sunday in 1997. That is, we added the last 4 days from 1997 to the “first week” of 1998. A similar process was used to create the first week in 1999 and the subsequent years as well. This procedure yielded 4 years of data, each containing 51 comparable weekly totals.⁶

Volunteer activities chosen. We were provided with another spreadsheet that contained the daily totals of how many people offered to volunteer in each of the 27 entries presented in the dropdown menu on the Web page. Although it would have been preferable to have all 4 years of data on the entries chosen, we were only given information on charities selected from September 7, 2001, through

⁵The reader may wish to go to the VolunteerMatch website to learn more about how people sign up to volunteer.

⁶There were 51 rather than 52 weeks in each year because we only used totals from full 7-day weeks. Weeks that began in one year and ended in another were not included in that year. Thus, the “missing” weeks always involved the last few days of a given year.

December 31, 2001.⁷ September 7, 2001, was a Friday, 4 days before the attacks in New York and Washington, DC. Therefore, to avoid confounding the pre-attack and post-attack volunteering rates with specific days of the week, only the totals for these 4 days (i.e., Friday Saturday, Sunday, and Monday) in each of the weeks were used in the analysis. The reliability in totals across these 4 days was assessed in the same manner. Again, the coefficient alphas were all in excess of .90.

State of residence. A third spreadsheet contained the daily totals for all 50 states, plus the District of Columbia and Puerto Rico. The state data were available only for the time period from September 7, 2001, to October 15, 2001. Again, to avoid confounding changes in volunteering rates with specific days of the week, only totals for Friday through Monday were used. Also, Puerto Rico was excluded from the final data analysis because of the very small number of people from this location who contacted VolunteerMatch during the time period studied.

Using census data and other sources, we obtained the following information about each state and the District of Columbia: population; total yearly donations to charity; average education; median income; percentage voting in the last election; percentage reporting that they regularly attended religious services; percentage of residents in the active military or the reserves; percentage of residents with a personal computer; percentage of residents with Internet access; distance from state capital to New York City; distance from state capital to Washington, DC; and the average of these two distances. The information about religious-service attendance was from 1990, while all of the other information was published in 2000. Finally, as part of an exploratory analysis, we used Vandello and Cohen's (1999) ratings of relative collectivism in each of the 50 states.

Results

Changes in Volunteer Rates

The first research question concerns the amount and duration of increases in the number of people who used VolunteerMatch to contact a charity and offer to volunteer after September 11, 2001.⁸ However, in the interest of simplicity, we are using volunteer rates or volunteering to describe the public offer to

⁷The data on charities selected and volunteering by state covered shorter periods of time because the way in which these kinds of information were entered into VolunteerMatch's database made it quite difficult and time consuming for the VolunteerMatch staff to retrieve this information and provide it to us.

⁸As noted previously, we do not know the percentage of people who actually did volunteer (i.e., who actually worked for a charity/service organization).

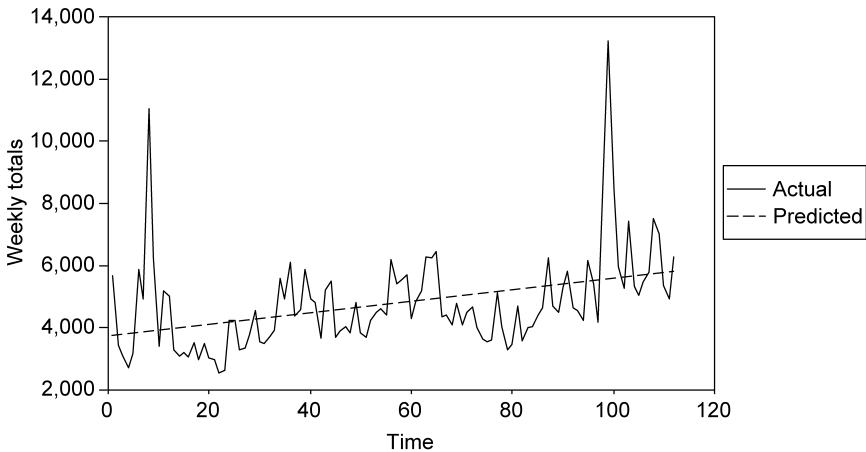


Figure 1. Predicted and actual volunteering: October 1999 through December 2001.

volunteer. Before the analyses relevant to these questions were carried out, we looked for general trends in the data over 4 years. A cursory examination of the volunteering rates across the 4 years suggests a steady and substantial increase across time.

In order to investigate this trend more systematically, a linear regression analysis was computed/conducted in which weekly totals for all 4 years (i.e., 1998 through 2001) were regressed onto time (operationalized as week number; $R^2 = .74$, $F(1, 203) = 559.13$, $p < .0001$). An examination of this regression scatterplot shows a substantial discontinuity in volunteer rates beginning around Week 92, or late October 1999. The most likely reason for this is that on about October 17, 1999, the AOL Online Foundation entered into a partnership with Volunteer-Match and began an extensive Internet-based campaign to publicize the organization and to encourage people to volunteer through it.

Although the effects of this effort are impressive, they are not relevant to the specific questions of interest. More important, it was our judgment that if we included the pre-October 1999 data, we might provide an inaccurate estimate of the impact of the attacks on volunteering rates. Therefore, we decided to include only data from the week of October 17, 1999, through December 31, 2001, in the subsequent analyses. For this time period, the overall means and standard deviations of weekly volunteer totals were 4,770.90 and 1,576.53, respectively. The regression analysis based on these later data yielded an R^2 of .15, $F(1, 111) = 18.79$, $p < .0001$, indicating a small but still significant increase in volunteering rates over the time period studied. Figure 1 presents the scatterplot derived from this regression.

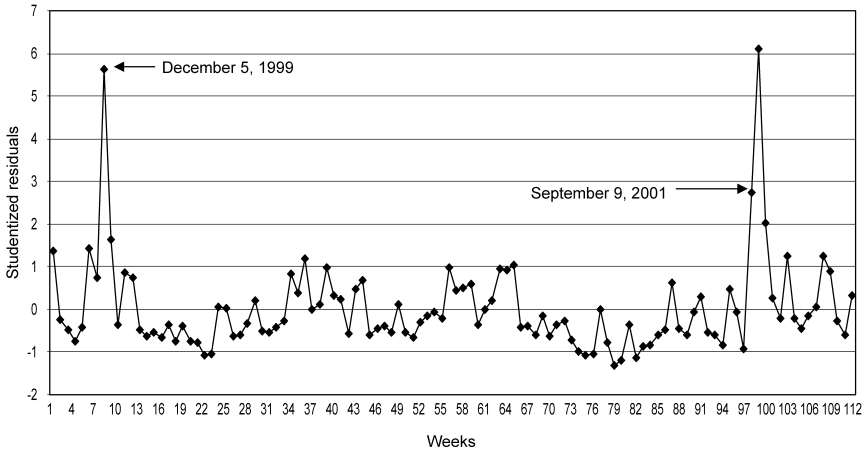


Figure 2. Studentized residuals: October 1999 through December 2001.

A cursory examination of the deviations from the best-fit regression line shows unusually high volunteering rates during two time periods: early December 1999 and early through late September 2001. In an attempt to quantify more precisely the magnitude of these deviations, a distribution of Studentized deleted residuals (SDRESIDs; Pedhauzer, 1997) from the best-fit regression line was then created. This technique computes each data point's deviation from the regression line in standardized units ($M = 0$, $SD = 1$), with that data point excluded from the overall regression so it has no influence on the placement of the regression line distribution. SDRESID is distributed as a t distribution, but as Pedhauzer noted, "it is generally used not for tests of significance but for identifying large residuals" (p. 47). The distribution of the residuals is shown in Figure 2.

There were 4 weeks for which the volunteer totals deviated 2 or more standard deviations from the mean of the distribution. The first of these was the week of December 5, 1999; the volunteer total for this week was 5.63 standard deviations above the overall mean of the SDRESIDs (actual volunteering rate = 8,285). This increase is most probably because of the fact that during that week, Oprah Winfrey's television show contained a segment specifically about VolunteerMatch. The three other substantial deviations from the mean of the residual's distribution appear to be a direct result of the September 11 attacks. These were for the weeks of September 9, September 16, and September 23, 2001. The SDRESIDs for these three weeks were 2.72, 6.12, and 2.02, respectively. The actual volunteer rates for these three weeks were 9,370; 13,227; and 8,459, respectively.

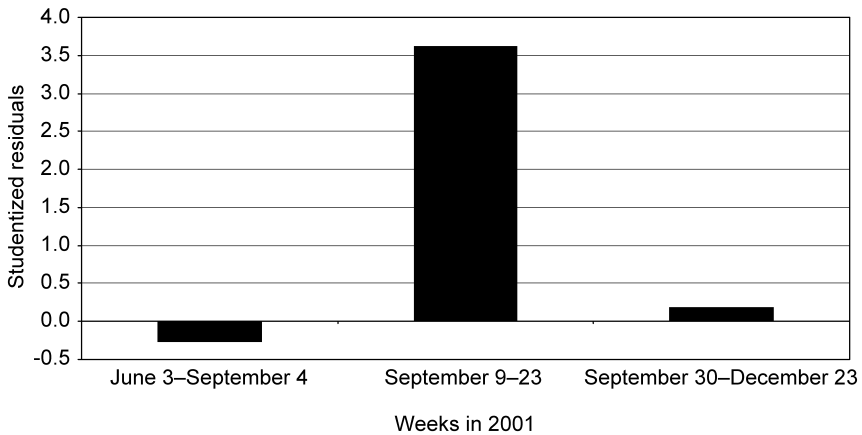


Figure 3. Volunteer rates for three time periods.

The impact of the attacks on volunteer rates also can be seen in a hierarchical regression analysis in which the predictor variables entered into the equation were time and September 11, respectively, coded as 1 (*before*) or 2 (*after*). The criterion variable again was weekly volunteer rates. The overall R^2 was .28, $F(2, 110) = 21.21$, $p < .001$; and the standardized regression weight for September 11 was significant ($\beta = .42$, $p < .001$). Thus, both kinds of analyses show that, as expected, volunteering dramatically increased after September 11.

Although the first two figures clearly show the dramatic increase in volunteering immediately after September 11, 2001, they also suggest that this increase was of a relatively short duration. The question about the duration of this change in volunteer rates was addressed directly by comparing the volunteer rates during the weeks immediately preceding and following the attacks. More specifically, we compared (a) volunteering rates for the three peak weeks to the rates in the remaining 12 weeks of 2001; and (b) these final 12 weeks to the 12 weeks that immediately preceded the attacks.

First, we consider the raw totals. The average weekly volunteering rate for three peak weeks was 10,352; and the averages for the 12 weeks immediately preceding and following this 3-week period were 5,034 and 5,960, respectively. These data are informative, but the averages are somewhat confounded with the general trend for volunteering rates to have increased over time. Therefore, it was decided it would be more appropriate to compare the mean SDRESIDs for these three time periods. These residuals are presented in Figure 3.

The one-way ANOVA conducted on the SDRESIDs for the three time periods produced a significant F ratio, $F(2, 24) = 26.33$, $p < .001$. Post hoc tests (LSD) disclose that, as one would expect, the mean SDRESID for the 3 weeks

including/immediately following the attacks ($M = 3.62$) was significantly greater ($p < .001$) than the mean residual for both the 12 weeks that preceded them ($M = -0.27$) and the 12 weeks that followed them ($M = 0.18$). However, the mean residual for these latter 12 weeks was not significantly higher ($p > .05$) than the mean residual for the 12 weeks that preceded the attacks.⁹

Volunteering for Different Charities

The second research question concerns changes in volunteer rates for specific kinds of charities/service organizations. Recall that data on specific kinds of volunteering were available only for the 4 days immediately preceding September 11 and that these data were compared to the same 4 days of the week (i.e., Friday through Monday) for the 15 weeks after that date. A visual inspection of the spreadsheets discloses that during the Friday through Monday period following September 11, the volunteering rates increased substantially (at least tripled) for every single one of the 27 kinds of charity/service organizations listed by VolunteerMatch. A more fine-grained analysis of these changes will be presented.

An examination of the targets or activities that were the primary focus of the organizations associated with each of the 27 entries on the dropdown menu suggests that most of the entries would fall into one of four categories. These categories are as follows: popular target organizations, serving a nonstigmatized and usually well-regarded group of people (e.g., children, women, hungry people, seniors); unpopular target organizations, serving a frequently stigmatized or not usually well-regarded group of people or activity (e.g., gays and lesbians, homeless individuals, refugees and immigrants, human rights); crisis-related organizations, engaged in activities clearly related to attacks (e.g., emergency and safety, crisis relief, health); and community-related organizations, engaged in activities that benefit the general community (e.g., voter education, environmental cleanup, arts and culture).

Two judges independently attempted to assign the 27 entries to these four categories. There was complete agreement between the judges as to the categories in which 22 of the entries belonged. The remaining five did not seem to belong in any of the categories, and there did not appear to be any underlying commonality among them with regard to activities or purpose. Therefore, they were not used in the analyses that follow.

⁹Although unlikely, it is possible that this 3-week increase reflects a seasonal effect, rather than an expected effect of the attacks. A visual examination of exactly the same time periods in 2000 shows no such effect. However, an additional analysis was conducted. The volunteering rates for these 27 weeks were regressed onto exactly the same weeks in 2000, and the SDRESIDs for 2001 were obtained. Then, the ANOVA was performed on these "season-adjusted" residuals. The results of the ANOVA were virtually identical to those reported in the text.

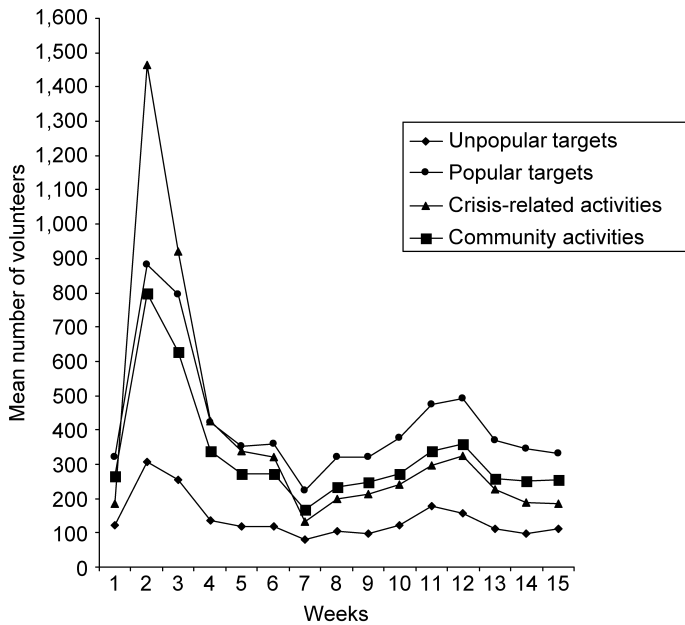


Figure 4. Volunteering across time for four kinds of organizations.

Because there were different numbers of organizations in the four categories, the analyses were conducted on the mean volunteering rates across the organizations within each category. Figure 4 shows these averages for the four categories across 15 time periods (1 pre-attack and 14 post-attack). A two-way split-plot ANOVA was conducted on these data, with time period being the repeated measure. The ANOVA yielded no significant effect for kind of group ($F < 1$), but there was a significant effect for time period, $F(14, 84) = 19.24, p < .00001$; and a significant Time Period \times Group interaction, $F(42, 84) = 1.95, p < .01$. A post hoc analysis of the time period effects, using Tukey's Studentized range test (HSD), provides results comparable to those discussed earlier. Volunteering rates in the first two 4-day periods immediately following the attack were significantly greater ($p < .05$) than any of the other time periods.

Of more interest is the significant Group \times Time Period interaction. Visual inspection of the figure discloses the likely cause of this interaction. During the Friday through Monday immediately following the attacks, the volunteer activities that benefited popular targets, unpopular targets, and the community all had about a threefold increase in volunteer rates, but the crisis-related activities experienced almost an eightfold increase (from 185 to 1,464, averaged across the three organizations in this category), and the mean volunteering rate was about 2

to 3 times as great as the means in the other three categories. However, by 4 weeks after the attacks, the volunteering rates for crisis-related organizations were about the same as the rate for the popular-target and community-activities organizations. And by 6 weeks after the attacks, the mean volunteering rate for the crisis-related organizations (134) was lower than either of these two groups (popular, $M = 224$; community, $M = 169$) and higher only than the rate for the unpopular target organizations (80).

Correlates of Volunteering

The final research question concerns the correlates of volunteering rates before and after the attacks. Our primary interest was whether the relationships that are usually found between certain demographic variables and volunteering also would be found after the attacks. As noted in the Method section, the demographic variables and volunteering rates were aggregated at the state level. Specifically, the 4-day volunteering rates for each state and the District of Columbia were adjusted for the state's population by dividing the state's total population into each of the 4-day volunteer totals for that state. The resultant ratios were then used to examine the relationships between volunteering and all the variables presented in the Method section (e.g., percentage with at least a bachelor's degree, distance from sites of attacks, percentage with Internet access). The first set of analyses was a series of product-moment correlations between the predictor variables and adjusted volunteering rates for the 4 days just before the attacks (i.e., Friday, September 7, through Monday, September 10), and the same 4 days of the week during the first and second weeks after the attacks.

Only two variables were significantly ($p < .05$) correlated with volunteer rates across the three time periods. These were the amount donated to charity in 2000 ($r_s = .33, .35, \text{ and } .44$, respectively) and percentage of state population over 25 years of age with at least a bachelor's degree ($r_s = .54, .63, \text{ and } .64$, respectively).¹⁰ Although these correlations increased across the time periods, the differences among them were not significant.

A second and related way of asking the same questions was to compute difference scores between the adjusted volunteer rates for the 4 days that immediately preceded September 11 and the comparable days of the week during each of the 2 weeks after the attacks. Then these difference scores were correlated with the same set of predictor variables as were used in the previous analysis. Table 1 presents the results of this second set of analyses.

¹⁰We also used percentage of the state's total population with at least a bachelor's degree as an index of education; the correlations were almost identical. The same was true for the correlations with changes scores.

Table 1

Correlates of Changes in Volunteering Rates

Characteristic	Difference 1 (<i>n</i> = 51)	Difference 2 (<i>n</i> = 51)
Percentage voting in 2000 election	-.01	-.01
Percentage with computers	.17	.17
Percentage with Internet access	.29*	.27*
Average distance to attack sites	-.25	-.31*
Percentage attending religious services weekly	.07	.08
Percentage active or retired military	-.12	-.11
Amount donated to charity	.34*	.48*
Percentage with bachelor's degree	.57*	.54*
Median income	.31*	.36*
State collectivism score	.18	.07*

Note. "Difference 1" is the difference in volunteering rates between 4 days (Friday through Monday) of the week *before* the attacks and the same 4 days during the *first* week after the attacks. "Difference 2" is the difference in volunteering rates between the same 4 days of the week *before* the attacks and these same days of the week during the *second* week after the attacks. The *n* equals the 50 United States, plus the District of Columbia.

* $p < .05$.

Four variables correlated significantly ($p < .05$) with the first difference score (i.e., the adjusted totals for the Friday through Monday after the attacks less the adjusted totals for the same days of the week before the attacks). These were percentage of state population with Internet access ($r = .29$), amount donated to charity in 2000 ($r = .34$), percentage of state's population over 25 years of age with at least a bachelor's degree ($r = .57$), and median state income ($r = .31$). Five significant ($p < .05$) correlations were found for the second difference score. These were for the four variables just presented, and the average distance from the state's capital to New York City and Washington, DC ($r = -.31$). That is, the closer the state's capital to the crash sites, the more the state residents volunteered.

The significant relationships for donations, education, and income were largely consistent with prior studies of the demographic correlates of volunteering in the United States, the United Kingdom, and Canada (Independent Sector, 1999; Penner, 2002; Schroeder et al., 1995). The other two variables that yielded significant zero-order correlations have not been examined before. Therefore, the

last question we asked of these data was whether the two “new” variables would account for variance in volunteering rates that was not explained by the other variables.

To answer this question, we computed conducted hierarchical multiple regressions on each of the two difference scores. In both regressions, donations, education, and income were entered as the first block; and Internet access and average distance from the sites of the attacks were entered as the second block of predictor variables. The variance uniquely explained by the second block was examined. The overall R^2 for regression involving the first difference score was .44, which was significant, $F(5, 43) = 6.72, p < .001$. However, entering the second block of variables (i.e., distance and Internet access) did not significantly change the R^2 ($\Delta R^2 = .04$), $F(2, 43) = 1.56, p > .20$. The second regression equation produced very similar results. The overall R^2 was significant, $R^2 = .52, F(5, 43) = 9.45, p < .01$, but the increment in the R^2 was not, $\Delta R^2 = .06, F(2, 43) = 2.51, p > .20$.

Discussion

In the interest of clarity, the discussion of the results will be organized around the major questions of interest. First, we consider how the attacks of September 11 affected the rate of volunteering in the United States.

Magnitude and Duration of the Impact of the September 11 Attacks on Volunteering

It appears that this national tragedy produced a very dramatic increase in interest in volunteering among Americans. This can be seen in the raw numbers of people who signed up to volunteer, as well as the deviations from the best-fit line for the regression of volunteering rates on time. With regard to the former, during the 3-week period beginning with September 9, 2001, and ending with September 30, 2001, well over 30,000 people signed up to work as volunteers through this online service. This was more than double the rate during any other 3-week period for the 4-year period VolunteerMatch had been operating its website. The only other time when there was such a dramatic volunteering increase was in December 1999, when the organization was featured on a popular daytime television talk show. That increase, however, was limited to the week in which the show was broadcast and was smaller than that seen in any of the 3 weeks following September 11, 2001.

As discussed in the introduction, the post-September 11 increase in interest in volunteering would be predicted by several social psychological theories, but the data available in this study do not allow us to identify one theory that best explains the increases. Indeed, we suspect that no single theory of the causes

could explain the increase; rather, it is likely that several causal factors complemented one another. For example, it seems that the dramatic stories of rescuers that appeared in the print and electronic media may have provided prosocial models that made people more likely to act in prosocial ways. But, at the same time, the images of death and destruction that followed the attacks may have served to heighten people's feelings about the injustice of the attacks (as predicted by just-world theory) or their awareness of their own mortality (as predicted by terror management theory). Further, it seems that both of these latter reactions would be exacerbated by the sense that one's own community (i.e., the United States) had been attacked.

The second part of the question about the impact of the attacks concerns the duration of the increase in volunteering rates. As noted in the introduction, media reports suggested that there were continued high levels of volunteerism in the weeks and months that followed September 11, and a number of volunteer-service organizations claimed that the surge in volunteerism persisted for a long time after the attacks. However, our analysis suggests that the increase was relatively short lived. For example, none of the residuals for the 12 weeks following the peak 3 weeks deviated substantially from the mean of the overall distribution of the residuals. The ANOVA comparing volunteering rates immediately before and after September 11 shows that the volunteering rate (i.e., the number of people who offered to volunteer) for the 3 peak weeks was (of course) significantly greater than the 12 weeks that preceded or followed them. But more importantly, the ANOVA failed to produce a significant difference in volunteer rates between the 12-week period before the attacks and the rates for the last 12 weeks of 2001.

Of course, collapsing across the individual weeks could have masked a trend within each time period, so we also attempted to fit some function (e.g., linear, cubic, quadratic) to the curve for volunteer totals for the individual weeks used in the ANOVA. No function that we examined provided any better description of the data than what is shown in Figure 3. That is, volunteering spiked dramatically during the 3-week period and then returned to more or less pre-September 11 levels for the remainder of the year. We also were unable to identify any substantial increases in volunteerism that were associated with President Bush's nationally televised speech that encouraged volunteering, the enormous media attention that was given to the anthrax-laced letters received by members of Congress, the American invasion of Afghanistan, or any other well-publicized event during the last 12 weeks of 2001. In fact, when we compared the standardized residuals for last 12 weeks of 2001 to the residuals for the same 12 weeks in 2000, we found that the 2001 volunteering rates were nonsignificantly lower, $t(22) = -0.17, ns$.

Finally, we used the data on state volunteer rates to see if the increase in offers to volunteer continued any longer in the areas most immediately affected

by the attacks: New York and Washington, DC. The volunteering patterns in these two areas were essentially the same as the national pattern. There was a dramatic increase in volunteering in the weeks immediately after the attacks, and then a return to pre-attack levels. Thus, the duration of the effects of the September 11 attacks appears to be comparable to the duration found in most other studies of how well-publicized media events affect individuals' behavior (e.g., Brown & Potoskey, 1990; Phillips, 1985; Sorrentino et al., 1974).

Types of Volunteer Organizations

The second major question concerns the impact of the attacks on volunteering rates for different kinds of charities/service organizations. As we expected, organizations whose activities could be most easily and directly tied to helping the victims of September 11 experienced the greatest increase in offers to volunteer. On first inspection, the reason for this disproportionate increase in interest in these organizations would seem fairly obvious. The people who volunteered to work for them wanted to do something that would most immediately and directly remediate the effects of the attacks. However, this explanation becomes less obvious when the specific kinds of organizations listed on the VolunteerMatch website are examined more closely. The vast majority of the crisis-related organizations had a local rather than national focus; that is, their activities were concentrated in the local community. Thus, a volunteer who lived some distance from New York or Washington, DC, was not really choosing activities that would, in fact, directly help the victims of the attacks. Why, then, did the volunteers disproportionately choose these kinds of organizations?

Obviously, given the nature of the data, we cannot provide any definitive answers to this question. However, we can offer a few speculative conjectures. First, the choice may not have been based primarily based on the belief that the volunteer's actions would benefit the attack victims. For example, given that the attacks made volunteering more probable, working for a crisis-related organization may simply have been a much more salient choice than working for the other kinds of charities. It would be, after all, most easily connected to the plight of the victims of the attacks.

Another related explanation is that in the aftermath of the attacks, volunteering for crisis-related organizations might have bestowed greater status and prestige on the volunteers than working for other kinds of organizations. In other words, offers to volunteer for crisis-related organizations may have served to increase the participants' sense of self-esteem and self-worth. Such an explanation is consistent with prior research findings about the various motives that underlie volunteering. Although altruistic or other-oriented motives are the most common reasons why people initially volunteer (Independent Sector, 1999; Omoto & Snyder, 1995; Penner, 2002; Penner & Finkelstein, 1998), egoistic and

self-serving concerns also can play an important role in motivating people to engage in this behavior (Clary et al., 1998).

Finally, we must consider the possibility that for many people, choosing crisis-related charities was, in fact, a rational choice. They might have thought that by helping a national crisis-related organization's local office (e.g., the local chapter of the Red Cross), they were helping the victims of the attacks by enabling the national organization to allocate more of its total resources to the victims of the attacks.

A somewhat more counterintuitive finding is the substantial increases in volunteering for all other kinds of charities/service organizations. The theoretical models presented in the introduction all would predict greater volunteering for organizations that serve popular targets or activities (e.g., children, seniors, hunger) and the community's activities (e.g., political, education), but we do not think they all would have predicted the same kinds of initial increase for the organizations that serve traditionally stigmatized groups (e.g., gays, lesbians, bisexuals) or groups/activities that would have become stigmatized in the wake of the attacks (e.g., immigrants and refugees, human rights). Indeed, it would seem reasonable to suggest that terror management theory might predict just the opposite trend for volunteering for these particular organizations. Following are some possible explanations for these somewhat unexpected findings.

It now seems clear that after the attacks, a very large number of people felt a need to volunteer. Volunteering is almost invariably a thoughtful and planned activity. That is, people do not impulsively or mindlessly volunteer, but rather they select organizations they consider useful and worthwhile and engage in activities that are consistent with their own beliefs and values (Davis et al., 1999; Penner, 2002). Thus, we would suggest that the increase in volunteering for charities that served unpopular targets occurred primarily among people who supported the cause or mission served by these organizations. Similarly, people who were concerned about a popular target group (e.g., children, seniors) or community activities selected organizations that address these concerns. In other words, although many people's choice of an organization probably reflected a direct response to the attacks, there were also many other people who responded to the attacks with an increased willingness to help those organizations or causes in which they already believed. It should be noted also that these findings provide almost no support for the anecdotal reports in the media after September 11 that the increase in volunteering for crisis-related service organizations was achieved at the expense of volunteering for non-crisis-related organizations.

Correlates of Volunteering

The final question of interest concerns the correlates of volunteering. Specifically, we asked whether the relationships usually found between certain

demographic variables and volunteering changed in the aftermath of the attacks. An ancillary to that question is whether any new relationships emerged because of the unique nature of the September 11 attacks.

The analyses of the changes in volunteer rates from before to after the attacks yield significant correlations for three demographic variables: amount previously donated to charity, educational level, and median income. These three relationships were consistent with findings from a number of prior studies of the correlates of volunteering (e.g., Independent Sector, 1999; National Centre for Volunteering, 2002; Penner, 2002; Statistics Canada, 2001; also see Schroeder et al., 1995). However, in contrast to findings from some of the same studies, the measure of religiosity (i.e., the percentage of the state's population who regularly attend religious services) did not correlate with volunteering. We do not know why this null result occurred, but we suspect that this may have been too crude a measure of the construct of interest, or perhaps because the data on religiosity we were forced to use were over 10 years old. A better and more recent measure of the average strength of religious beliefs within a state might have yielded different results.

Two other variables were associated significantly with changes in volunteer rates: percentage of the state with access to the Internet, and average distance from a state's capital to the site of the attacks. The relationship for Internet access is somewhat confounded with educational levels, as these two variables were correlated at .30 ($p < .05$). And when educational level is partialled out of the correlation between Internet access and changes in volunteer rate, the correlation remains positive but becomes nonsignificant. However, we do not believe that the zero-order correlation for Internet access is totally spurious. The simple fact is that no matter what a person's educational level, he or she could not have volunteered via VolunteerMatch without Internet access. Thus, we would suggest that Internet access is a necessary, but not a sufficient condition for volunteering using this medium.

Now we turn to the significant relationship between the distance from the state where the volunteers lived to the sites of the attacks and changes in volunteering. In passing, it should be noted that distance was not significantly related to any of the other variables that were significantly associated with volunteer rates. Our explanation of this finding begins with the assumption that the closer people lived to the cities that were attacked, the greater was the psychological impact of the attacks. This assumption is consistent with a body of theory and research suggesting that the closer the source of the influence is to its object, the greater is the source's social influence (e.g., Latané, Liu, Nowak, Bonevento, & Zheng, 1995).

Thus, the more affected people were by the attacks, the greater was their willingness to offer their services as volunteers. We cannot, of course, specify the nature of their reaction (e.g., terror, sense of injustice, perception of threat,

negative affect, sympathy, empathy). However, the stronger any one of these reactions are, the more likely people are to offer help. Thus, we are suggesting that physical (and thus psychological) closeness was an intensifier of sentiment, and this served to increase volunteer rates somewhat.

Although Internet access and distance from the attack sites both yielded significant zero-order correlations with changes in volunteering, when Internet access and distance were entered into a hierarchical regression after the traditional variables, they did not account for unique variance in changes in volunteering rates. Thus, although these two variables did correlate with volunteering after September 11, it appears that they were not still incrementally important beyond the kinds of variables that typically are found to be associated with volunteerism.

Study Limitations

Before summarizing the results and drawing some final conclusions about volunteering after September 11, we need to discuss a few of the study's possible limitations. The first of these limitations concerns whether these data represent actual acts of volunteering. As we have noted several times, the daily totals analyzed were the number of people who wrote to an organization and VolunteerMatch and indicated that they wanted to volunteer. We have no hard data on the percentage of people who actually followed through and spent some time volunteering. Nor do we know how long those people who volunteered worked for the organization they chose. We would argue, however, that these data are construct-valid indicators of how the September 11 attacks affected actual volunteering in the United States. We base this argument on the social psychological literature on the relation between intention and behavior.

The people whose responses we analyzed had said that they intended to volunteer. More precisely, they contacted a specific organization, told them they were interested in volunteering, provided personal information about themselves, and asked the organization to contact them. And in some instances, they allowed their names to be placed on the website as volunteers for this organization. There is a long and consistent research literature that shows that intentions under such conditions are rather strong predictors of actual behavior (e.g., Ajzen, 2000). To be sure, the number of people who actually worked as volunteers is probably less than the numbers reported in the Results section. But there is no obvious reason to suspect that the differences between intentions and actual behavior were any greater after September 11 than before, or differed across types of charities or states of residence. Thus, it is our view that the responses we analyzed do, indeed, accurately (albeit not perfectly) show the impact of the September 11, 2001, attacks on volunteering among the people who contacted this website.

There is, however, the related question of whether the responses of these people are representative of all Americans' responses to the attacks. It seems obvious that the participants in this study self-selected and were not a representative sample of citizens of the United States. For example, by definition, 100% of the people who participated in this study had some sort of access to the Internet, but we know from national surveys that only about 65% of the general public have Internet access (Featherly, 2001). Further, since the percentage with Internet access is generally lower among certain ethnic minorities and groups that are economically or educationally disadvantaged, our sample is probably biased toward well-educated, affluent people of European ancestry.

Thus, the question becomes whether an obvious selection bias would also bias the results of this study. That is, would we have found a different pattern of results had we somehow been able to obtain comparable data about volunteering from another, non-web-based source? In response, again we would note that in the United States, volunteers are more likely to be well educated, affluent, and of European ancestry than are nonvolunteers (Independent Sector, 1999; Penner, 2002; Schroeder et al., 1995). Thus, our sample was probably more similar to the typical volunteer than to the general population.

But the question still remains as to whether the nonrandom sampling of participants produced patterns of change or significant relationships that would not have been found with a true random sample. Our cautious answer to this question is "No." We cannot easily identify a reason why our findings would have been different had we somehow been able to find a national database of volunteers who used more traditional means to volunteer. And even if there is some selection bias in these data, they still tell us something about how the September 11 attacks affected the behavior of a very large number of people.

There are, however, some other limitations in this study. One of these concerns the level of analysis. Whereas most social psychological studies and theories use an individual level of analysis, here the data were aggregated by days of the week, charities selected, and states. Thus, the data did not really allow us to identify the psychological processes that underlie volunteering or to distinguish meaningfully between the competing theoretical explanations of the relationships that were found. Thus, when we speculated about causal processes, we were making a substantial inferential leap from aggregated data to the individual psychological processes that are proposed to explain them.

The analyses concerned with the demographic correlates of volunteerism were subject to another limitation, which Robinson (1950) called the ecological fallacy. This fallacy can occur when data collected at the aggregate level are used to draw conclusions about processes that occur at the individual level. In this instance, the data on volunteering among the states do not necessarily tell us anything about volunteering among the individual residents of those states. Consider, for example, the significant relationship for education. It is possible (albeit quite

unlikely) that within the states with better educated populations, the volunteers were actually more likely to be the least educated residents of those states. Clearly, our causal inferences would be greatly strengthened by a complementary study in which the unit of analysis was individuals.

With these study limitations clearly in mind, we offer the following summary and conclusions.

1. Consistent with a number of social psychological theories about the effects of disasters (both natural and human made) on prosocial actions, the September 11 attacks resulted in a very dramatic increase in volunteering in the United States.

2. Although the increase in volunteering was dramatic, it was rather short lived. By 4 weeks after the attacks, volunteer rates were only marginally higher than they had been before the attacks.

3. The greatest increase in volunteering was for charities/service organizations that engage in a crisis-related activities, but volunteering for all of the studied charities also increased substantially. Contrary to media reports, increased volunteering for the former kind of organizations was not achieved at the expense of the other organizations. In the main, people appeared to volunteer for organizations that were consistent with their preexisting beliefs and values.

4. The strongest demographic correlates of volunteering after the attacks were those that have been identified in prior studies of volunteering. Thus, the relationships between these variables and volunteering did not seem to be altered by the unprecedented nature of the attacks.

5. From a practical perspective, recruiting people to volunteer via the Internet seems to represent a very cost-efficient and user-friendly way to obtain a substantial number of volunteers. However, given the ease of volunteering via this medium and the absence of personal contact at the time of volunteering, the strength of people's commitment to this activity remains unknown.

As noted several times in this article, we simply do not know how many people actually volunteered and, if they did, how long they remained active volunteers. Thus, before we make any definitive statements about the utility of VolunteerMatch (and other similar organizations), it would be necessary to compare the long-term course of volunteering among volunteers recruited via VolunteerMatch and those recruited via more traditional methods. It is hoped that future research will shed some light on this question.

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