DISSERTATION

AN APPLICATION OF ORGANIZATIONAL JUSTICE THEORY TO A COMMUNITY DISASTER

Submitted by

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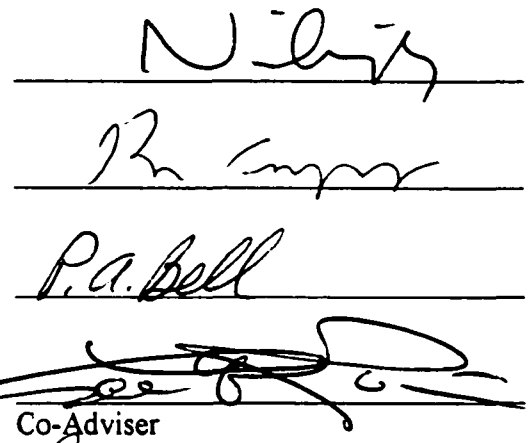
WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY PATRICIA L. HEYSE ENTITLED AN APPLICATION OF ORGANIZATIONAL JUSTICE THEORY TO A COMMUNITY DISASTER BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Committee on Graduate Work



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ABSTRACT OF DISSERTATION

AN APPLICATION OF ORGANIZATIONAL JUSTICE THEORY

TO A COMMUNITY DISASTER

The experiences of 100 residents of Fort Collins, Colorado, who were affected, financially and otherwise, by the 1997 flood were examined within the context of organizational justice. Theories of fairness provided a framework for exploring the outcomes of interactions between residents and City authorities in a community setting rather than the workplace, the traditional milieu for organizational justice research. This framework was also used to explore participants' self-reported levels of stress. Participants were recruited from neighborhoods that sustained damage from drainage system overflows rather than creek flooding. In order to limit the study to the neighborhoods of interest, a non-random sample was used. Participants' self-reported levels of flood impact, stress (retrospective and recent), perceptions of fair treatment by City authorities, and evaluations of the City were examined by a telephone survey. Hypotheses stating that perceived fair treatment of residents by the City would be related to positive evaluations of the City and lower levels of retrospective stress were generally supported, although the relationship between fair treatment and stress was small. A predicted positive relationship between impact severity and increased retrospective stress was also supported. Contrary to predictions, a negative relationship was found between impact severity and recent stress; however, this appears to reflect a floor effect in that

those with lower levels of retrospective stress had less room to improve. The predicted negative relationship between impact severity and evaluations of the City was not supported, but a predicted positive relationship between perceived distributive fairness (extent of compensation) and satisfaction with compensation was supported. Four *post-hoc* analyses were also considered. First, justice and retrospective stress were negatively correlated when impact was omitted from the analysis. Second, a negative correlation was also found between evaluations of the City and retrospective stress. Two of the *post-hoc* analyses tested the potential that satisfaction with compensation might mediate between impact and either retrospective stress or evaluations of the City. While its possible role as a mediating variable was not supported, satisfaction was negatively related to retrospective stress and positively related to evaluations of the City when impact was held constant. It was concluded that retrospective stress was positively related to reported impact and negatively related to perceptions of fair treatment, evaluations of the City, and outcome satisfaction. Recent stress was negatively related to reported impact but was not related to perceptions of fair treatment by the City. Evaluations of the City were related to perceptions of fair treatment and outcome satisfaction but not to the reported amount of damage sustained. Finally, those reporting distributive fairness also reported outcome satisfaction. Study limitations and suggestions for future research in this area are also discussed.

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Chapter I

Introduction

On the evening of July 28, 1997, heavy rains fell on Fort Collins, Colorado. The heaviest rainfall concentrations, six inches within a two-hour period, occurred on the west side of town and filled stormwater drainage systems beyond capacity. As a result of this storm, severe flooding occurred in several neighborhoods in southwest Fort Collins that were not located near Spring Creek, the primary source of flooding from this storm. In some of these neighborhoods, residents later expressed concern that City staff and officials responsible for stormwater drainage had not taken adequate measures to protect their neighborhoods from flood damage resulting from this type of rainfall event and that the City had, in fact, ignored safety concerns that had been expressed before the flood (Duggan, January 14, 1998). Specific concerns in these neighborhoods included: inadequate stormwater drainage facilities, the use of irrigation ditches to carry stormwater, and the rerouting of an irrigation ditch to the top of a newly constructed, earthen, dam-like embankment in order to accommodate a new housing development (Duggan, September 18, 1997; Duggan, November 1, 1997).

Following the flood, residents in some affected areas engaged in ongoing interactions with City staff members and officials in order to address flood safety in their neighborhoods (Fort Collins City Council, June 16, 1998). Many of these interactions occurred during a series of meetings in which residents expressed concern about safety

issues and about the apparent failure of the City to take their concerns seriously. In addition, residents insisted that City staff and officials take responsibility for their actions by improving safety policies and procedures in their neighborhoods. These meetings were often characterized by angry interchanges between residents and City staff members, and a conflict manager was ultimately called in to moderate some meetings. Despite their often-discordant nature, the outcome of these meetings was that improvements were made to some of the drainage facilities in question (Duggan, January 14, 1998; Fort Collins City Council, June 16, 1998). In addition, at the urging of residents, the City created a task force to revise the local standard for rainfall protection. On the recommendation of this task force, the magnitude of rainfall for which the City would design flood protection for residents was increased (Henley, February 27, 1999; Henley, March 3, 1999; Precipitation Study Task Force, October 22, 1998). While these changes appear to be positive, some questions remain about the processes by which the changes were effected. Specifically, did the decision-making processes that led to these changes affect residents' satisfaction with the improvements, their attitudes toward City authorities, and their ability to recover from the flood? Furthermore, how could government entities respond to citizens affected by similar disasters to ameliorate some of the negative outcomes?

In order to address questions of this nature, it is useful to place them within a theoretical framework. Organizational psychology, for example, has examined the role that processes play in the way individuals and groups respond to decisions in the business world. One organizational model, Fairness Theory (Folger & Cropanzano, 1998), may be used to illustrate the application of an organizational theory to the flood safety concerns

in these neighborhoods, the interactions between residents and City personnel, and the responses of residents to the improvements made. This model suggests that, following a negative event, those who were affected look for someone to blame and for some way to recover their losses. The level of blame ascribed to the responsible party is postulated to depend on the severity of the outcome, the extent to which the actions of the responsible party can be justified, and the degree to which the responsible party adhered to ethical standards. Violations of ethical standards are also thought to fuel resentment and outrage on the part of the affected party. However, when the actions of the responsible party are considered to be justifiable and in accordance with ethical standards, levels of anger, resentment, and blame should be reduced.

Within this framework, residents of the neighborhoods of interest in the present study may be seen to have experienced a negative outcome in the form of flood damage. They then blamed City personnel responsible for stormwater drainage for their losses and made an effort to prevent future losses through attempts to influence the City's policy and procedures for flood protection. The level of blame ascribed to the authorities would be expected to depend on the severity of damage sustained and the degree to which the actions of the City, with respect to flood safety, were considered to be justifiable and in accordance with ethical standards. If staff members were perceived to have acted unjustly by providing inadequate flood protection in the neighborhoods, they would be more likely to be blamed for damages. Furthermore, perceived deviations from ethical standards by City personnel would be expected to increase the level of resentment and outrage on the part of the residents. If, however, their actions were perceived to be justifiable and ethical, the levels of anger and blame would be expected to decrease.

The application of Folger and Cropanzano's (1998) model to this local problem is only one example of how a neighborhood issue can be examined in a theoretical context. This issue may also be placed within the broader theoretical and practical frameworks of community justice, disaster research, and organizational psychology.

Community Justice

Community justice has both ancient and modern historical roots. The ancient roots may be found in early Christian and Asian societies in which interpersonal and social justice problems were often brought to the public forum. Recent antecedents are found in the social climate of the 1960's and 1970's which emphasized humanism, justice, and community empowerment (Duffy, 1991). The community justice model is based on the assumptions that lack of trust is a source of conflict and that conflict may be mitigated by admissions of wrongdoing and expressions of remorse (Worchel & Lundgren, 1991). In general, the goals of community justice programs include fostering positive social change and empowering communities to resolve their own problems.

Recent decades have seen the influence of justice models in labor relations, the legal system, and neighborhood justice programs. The early focus of these programs was to bypass the court system on civil and criminal matters; however, this focus has since been expanded to include the arena of public policy disputes, including such matters as land use and inadequate public services (Duffy, 1991). While some issues of a public nature may be relatively straightforward, many are complex and difficult and involve not only public opinions and community values but also government regulations (Carpenter, 1991). The present study represents an example of a community dispute over the adequacy of public services.

The field of community justice traces its conceptual roots to social psychology and to theories of conflict and conflict resolution. One early conceptual influence on this field is Attribution Theory (Heider, 1958), which addresses the way human beings explain everyday events. Heider suggests that people often blame others for difficult or unpleasant circumstances in an effort to make sense of them. Attributions of blame or responsibility, however, can be influenced by extenuating circumstances.

Models of conflict and conflict resolution have examined the role of social and environmental influences on conflict situations. For example, Lewin's (1951) Field Theory applied the concept of fields in physics to a social context. This model suggests that numerous social and environmental factors influence social systems. Lewin's theory influenced the work of Deutsch (1987, 1993) who explored the role of processes and outcomes in conflict situations and proposed that certain characteristics of processes, such as cooperation or competition, influence whether solutions are constructive or destructive.

The field of restorative justice applies some of the principles of these theories to criminal justice (see McGillis, 1997). In this method, victims and offenders are brought together outside the courtroom, where the offender apologizes to the victim and offers to make amends. The expressions of remorse and the corrective actions of the offenders offer a constructive process through which to mitigate blame and outrage and improve community functioning.

Several community justice principles may be applied to the present study. For example, Attribution Theory suggests that residents are likely to blame City authorities for damages sustained during the flood. The amount of blame, however, might be

reduced if extenuating circumstances are present and the damage can be reasonably explained. Restorative justice indicates that the degree of anger and blame held by residents toward the City could be reduced if relevant individuals were willing to apologize for the damages and offer to improve safety or make restitution. Conflict Resolution Theory suggests that the quality of any solution will be affected by the processes involved in deciding the outcome. In light of these assumptions, the present study seeks to examine whether the way flood relief and mitigation were managed by the City affected residents' attributions of blame and feelings of anger toward the City as well as their satisfaction with the assistance they received.

Disaster Research

The impact of disasters is a relatively recent field of study that emerged in the post-World War II era with studies of the Holocaust and of survivors of combat (Erikson, 1976; Green et al., 1990). While it has been difficult to identify specific features that differentiate disasters from other negative events, they are in general sudden, unpredictable phenomena of a dramatic and disruptive nature (Bell, Greene, Fisher, & Baum, 2001; Erikson 1976) and tend to become points of reference in the lives of those affected (Raphael, 1986). The impact of disasters is measured in terms of scope and intensity, amount of damage, abruptness of onset, and disruption of everyday life (Bell et al., 2001; Miller, 1977; Raphael, 1989). These concepts may be applied to individuals and to communities.

The disaster literature also differentiates between natural and technological disasters (Bell et al., 2001). While the former involves catastrophic events related to the natural world, the latter addresses situations related to human manipulation of the

environment (Smith, North, & Price, 1988). Bell et al. (2001) suggest that technological disasters are more likely to evoke intense anger than natural disasters.

Floods are one of the major categories of natural disasters as are hurricanes, earthquakes, and other catastrophic natural events. Floods can be slow in developing, as along the Mississippi River, or can be flash floods, as in the Big Thompson Canyon in Colorado. Urban floods, such as the one that occurred in Fort Collins, are usually flash floods (N. Grigg, personal communication, January 4, 2000). Floods can also be the result of technological problems including dam failures, such as the 1889 Johnstown, Pennsylvania, flood and the 1972 Buffalo Creek flood, in West Virginia (Bell et al., 2001; N. Grigg, personal communication, January 4, 2000). Managing losses from floods occurs in stages including preparation (increasing awareness and preparedness ahead of time), mitigation (actions taken to reduce or eliminate the risk of disaster damages), response (emergency and relief measures), and recovery (returning to typical daily conditions). Mitigation efforts may include structural features, whereby physical objects are built in an effort to reduce disaster risk, or non-structural changes, such as revising floodplain boundaries (Grigg et al., 1997; N. Grigg, personal communication, January 4, 2000).

In the present study, although the heavy rains represented a natural event, questions by residents about the adequacy and appropriate use of stormwater facilities and potential design flaws in the earthen dam were suggestive of technological involvement. Mitigation, in the present study, refers to changes made to the earthen dam and to other structures in and near the stormwater drainage systems, such as drainage

channels and detention ponds, to improve neighborhood safety and reduce the risk of future flood damage.

In evaluating the effects of disasters on individuals and communities, it is important to consider that these studies occur after the fact and access to pre-event data is usually limited. In addition, it is difficult to incorporate random sampling and experimental controls into the research design (Bell et al., 2001). Thus, such studies are largely naturalistic in nature. Much of the existing literature on disasters in the social sciences has focused on mental health and community functioning. (Erikson, 1976a; Green et al., 1990; Green et al., 1994; Raphael, 1986)

Mental health effects have been found to include symptoms of anxiety, depression, posttraumatic stress disorder (PTSD), and physical symptoms of stress (Green et al., 1990; Green et al., 1994; Raphael, 1986). Bell et al. (2001) have proposed a conceptual model that incorporates elements of stress, adaptation, and coping models to help understand the effects of disasters on individuals. According to this perspective, the actual impact of the event interacts with features of the individual and the social context to affect the degree to which daily functioning is disrupted after the event. If the event interferes substantially with daily functioning, the individual is likely to experience a stress response such as anxiety, depression, or physical symptoms. The individual's ability to cope with stress affects whether his or her subsequent adjustment will be successful or unsuccessful. If adjustment is unsuccessful, additional stress-related problems are likely to appear in the future. Furthermore, Green et al. (1990) suggest that those who suffer the greatest impact at the time of the disaster experience more prolonged effects of stress over time. With respect to the present study, the impact of the flood,

particularly the amount of disruption that this event brought to the lives of the victims, would be expected to be related to elevated levels of stress symptoms, and those with greater impact would be expected to report higher levels of stress over time as well.

With respect to community functioning, Raphael (1986) and Erikson (1976a) describe losses in the areas of human dignity, morale, trust, and connection. Raphael suggests that these effects may be long-term but that they may ultimately yield either positive or negative outcomes depending on the way the event is managed. Raphael maintains that victim input is essential to decisions pertaining to disaster recovery. Without input, victims are likely to feel angry, resentful, and distrusting. If, however, the event is managed sensitively, anger, resentment, and distrust may be moderated. In addition, Raphael maintains that, properly managed, disasters may offer opportunities to review, update, and improve policies and procedures in communities. Although the focus of the present study is on individual rather than community responses to the flood, one question that was examined was whether the opportunity to have input into flood mitigation decisions might reduce attributions of anger and distrust and personal outcomes such as stress symptoms.

Stress, Control, and Social Support

Although floods and other disasters have been demonstrated to affect the stress levels of disaster victims, psychological research has demonstrated convincing evidence that when individuals have some control over or choice in dealing with stressful situations, their levels of stress and associated physical symptoms are reduced (Lefcourt, 1992). In the present study, input into the flood relief and mitigation processes would represent a form of decision control that could potentially alleviate symptoms of stress. In

addition, social support has been demonstrated to have a beneficial effect on increasing effective coping and consequently reducing levels of stress (Carpenter & Scott, 1992). Appropriate interpersonal treatment of residents by City officials may be seen as a form of social support that might also reduce stress levels among affected individuals.

Social and Organizational Psychology

Concepts such as constructive processes, decision input, and blaming from community justice and disaster research are also found in social and organizational psychology. The attribution of blame, for example, has been one of the focal topics in social psychology, and some of the circumstances currently thought to affect the blaming process include whether or not the act was deemed intentional, whether or not the offending party had control over the outcome, and how much remorse the offending party expressed (Sheppard, Lewicki, & Minton, 1992). Other concepts such as decision-making and fair processes have occupied much of the organizational literature. This body of knowledge pertains to justice in the workplace and examines the outcomes and processes involved in decisions about resource distributions. These models suggest that judgments about justice are based on comparisons with the outcomes of referent others and adherence to accepted norms (Sheppard, Lewicki, & Minton, 1992).

The early contributions to this field address the outcomes of resource distribution, or distributive justice. The seminal work in this field is Adams' (1965) Equity Theory, which states that individuals compare outcomes to the relative contributions of the recipients. When an imbalance of input to outcome is perceived, the injured party may become angry with the perpetrator of the injustice and may attempt to restore the balance of the distribution. Although Equity Theory has most frequently been applied to the

distribution of resources in the workplace, it shares with Attribution Theory an examination of everyday events and may similarly be applied to the arenas of social policy, community standards, and the negative outcomes of disasters.

While the focus of distributive justice is on outcomes, the literature pertaining to procedural justice addresses the processes involved in decision-making and how they influence perceptions of fairness. The initial work in this area is Thibaut and Walker's (1975) Self-Interest Theory, which states that individuals prefer procedures that maximize their own outcomes. This model predicts that input into various stages of the decision-making process is related to outcome satisfaction and perceptions of fairness. Similarly, Sheppard (1985) indicates that the opportunity to express one's own opinion is an important feature of procedural justice. Sheppard (1984) also states that accurate information and consistent procedures contribute to perceptions of process fairness. The fair process effect has been found to affect outcome satisfaction and to influence negative outcomes more than positive outcomes. Colquitt (2000) indicates, however, that the effect of procedural justice on outcome satisfaction is small at best and that procedural factors are more likely to affect evaluations of leaders rather than outcome satisfaction.

Whereas procedural factors such as accurate information, consistency, and the opportunity for voice have been found to influence perceptions of fairness, the treatment of individuals during the decision-making process has also been established as an important influence on outcome satisfaction. Interactional justice addresses interpersonal aspects of the decision-making process and their effects on perceived fairness and outcome satisfaction. For example, the Group-Value model (Lind & Tyler, 1988) examines the way individuals are treated by authority figures within groups. This model

suggests that identification with a group is important to individuals. When individuals are treated with respect by authority figures, they identify with the group, take pride in membership, and experience enhanced self-esteem. These effects are likely to improve satisfaction with decision outcomes.

Interpersonal treatment, accuracy, and consistency are also addressed in the social accounts literature (Sitkin & Bies, 1993), which examines the influence of various types of explanations on perceptions of fairness. For example, the model states that several different strategies, such as making excuses, providing justification, and offering apologies, may minimize perceptions of blame associated with difficult organizational decisions. The quality of the explanation depends on both the accuracy of the information provided and the sensitivity with which this information is conveyed to the affected party. The social accounts literature also addresses the concept of remorse and suggests that apologies can often have beneficial effects.

Some models integrate principles of distributive, procedural, and interactional justice. Referent Cognitions Theory (Folger, 1986), for example, examines the role of process and outcome factors in decision-making on the level of anger and resentment experienced by the injured party. This model indicates that individuals compare their outcomes with those of others in similar circumstances and consider their allotment to be unjust if a substantial discrepancy exists between the two. In this model, the response of the injured party is comprised of a cognitive element, "comparison," and an emotional component, "outrage." In order to mitigate this response, the perpetrator of the injustice must accept responsibility for his or her actions and be sensitive to the injured party.

Similarly, Fairness Theory (Folger & Cropanzano, 1998) indicates that perceptions of fairness are related to outcome severity (negative impact) and accountability. The latter is comprised of two components: the capacity for the offending party to have acted differently ("could counterfactuals") and the adherence of the offending party to moral guidelines, or ethical standards ("should counterfactuals"), where counterfactuals refer to comparisons between actual events and presumed alternatives. As in Referent Cognitions Theory, this model identifies both cognitive (counterfactual) and emotional (moral outrage) elements of response and suggests that, in order to address injustice and minimize accountability, the offending party must provide an accurate excuse or justification for the action that is sensitive and conveys genuine concern for the affected party. In addition, although explanation quality and interpersonal treatment have often been treated as components of interactional justice, recent findings suggest that these constructs may be best represented as two justice factors: informational and interpersonal (Colquitt, 2000; Colquitt, Conlon, Wesson, Porter, & Ng, 2000).

Finally, while many of the social and organizational models address the management of perceived injustice from a preventive standpoint, retributive justice examines individuals' responses to injustices that have already taken place. Retribution Theory indicates that perceptions of injustice and violations of trust prompt individuals to seek revenge (Bies & Tripp, 1995). As in other models, the degree of responsibility assigned to the offending party is related to outcome severity, perceived intentionality, and perceived shortcomings in role expectations or standards of practice. Furthermore, the expression of remorse or contrition is expected to mitigate the injured party's

response. Although the present study does not address revenge or retribution, this theory illustrates an application of a justice model to events that have already taken place.

Summary of Pertinent Literature

The effectiveness of community justice programs has primarily been documented by examining the satisfaction of the parties involved, their perceptions of the fairness of processes and outcomes, and the persistence of the resolutions over time (McGillis, 1997). In a broad range of issues including divorce mediation, land use, and conflicts about public services, disputants have been found to be favorably disposed toward using community-based programs as alternatives to court proceedings. Examples of such cases in the public domain include conflicts between historic preservation and economic development interests and between city infrastructure improvements and the interests of businesses and private citizens (Carpenter, 1991). The endorsement of constructive alternatives to the court system suggests that sound procedures can affect outcome satisfaction. However, many of these evaluations have been methodologically limited and lacking in theoretical coherence (McGillis, 1997).

Much of the research on disasters has addressed the course of psychological symptoms and sociological effects over time. For example, research on the Buffalo Creek flood in West Virginia, conducted during the two-year period immediately after the flood and again in longitudinal follow-up studies, examined the impact of this event on personal and community functioning and also explored the recovery process (Erikson,1976a; Green et al., 1990; Green et al., 1994). Psychological symptoms found among Buffalo Creek survivors during the first two years included, but were not limited to, apathy, anxiety, depression, posttraumatic stress disorder (PTSD), fear, and

nightmares (Erikson, 1976a, 1976b). In longitudinal studies conducted 14 and 17 years after the flood, Green et al. (1990; 1994) found that for most survivors, the psychological symptoms of the early years were substantially reduced. However some adults showed increased symptoms of PTSD. In addition, increases in substance abuse and suicide were found among adolescents. Sociological effects included loss of faith in order and predictability, loss of morale, and loss of interpersonal connections and community functioning (Erikson, 1976a, 1976b).

The Buffalo Creek flood is of particular interest to the present study in light of the technological nature of the disaster as well as elements of the interactions between residents and relevant authorities that pertain to the justice literature. With respect to the technological aspects of this disaster, the flood was attributed to the failure of a dam-like structure comprised of waste from a coal-mining operation that collapsed during a rainy period. Of interest in light of the justice literature is that area residents had expressed concerns about dam safety prior to the flood but had been offered reassurances by mining company representatives. Following the flood, the mining company, which was a significant presence in the area and part of the identity of the community, was held responsible for physical and psychological damages in an out-of-court settlement (Erikson, 1976a). Both procedural and interactional justice factors appear to have played a role in this attribution of responsibility. First, the company was perceived to have fallen short of role expectations for maintaining a safe structure. In addition, the company was perceived to violate expectations about interpersonal treatment by responding in an insensitive, adversarial manner toward the residents (Erikson, 1976b).

In another approach to the flood recovery process, Miller (1977) examined the functioning and recovery of families affected by a natural disaster: the 1976 Big Thompson Flood in Colorado. As with findings related to Buffalo Creek, Miller reported elevated levels of anxiety, depression, PTSD, somatic symptoms, and problems in family and community functioning in the aftermath of this disaster. Although several features of families and social networks were determined to influence the course of recovery, it is interesting to note that 1 1/2 years after the flood, Miller expressed the opinion that "no flood victim was completely recovered..." (p. 59).

Studies based on organizational justice theories have lent support to many of the concepts proposed in the community justice model and are applicable to disaster research as well. These studies underscore the importance of voice (adequate representation and input), adequate reasoning (explanations and justification), adherence to ethical standards, and respect and sensitivity toward the injured party in enhancing perceptions of fairness and reducing anger and blame about negative events (see Bies, 1987; Bies, Shapiro, & Cummings, 1988; Konovsky, Folger, & Cropanzano, 1987; Konovsky & Folger, 1991; Shapiro, 1991).

A few studies have applied these organizational concepts to conflicts in the public domain. For example, Rasinski (1987) and Syme and Fenton (1993) explored the relationship between individuals' social and political values and their attitudes toward fairness. These studies found a correlation between either egalitarian or merit-based values and preferences for distributive or procedural justice, respectively. Hilton, Mathes, and Trabasso (1992) examined the explanations presented in media reports about the Challenger disaster and found that early explanations were causal in nature while

subsequent explanations included attributions of responsibility. Finally, Ebreo, Linn, and Vining (1996) applied the Group-Value model to public opinions about solid-waste management and reported that "process control and relational processes were...related to procedural fairness judgments" (p. 1259).

Other studies have addressed blame and accountability following disasters. Williams (1995) examined the role of the media in shaping public perceptions of responsibility following the Mississippi River floods of 1993 and found that, while assigning blame was not a priority of the media, the way the news was presented did influence public perceptions of responsibility and blame. Wells (1995) addressed issues of corporate liability and collective responsibility from the perspective of criminal justice and noted a trend toward blaming corporations for major disasters. Neal (1984) examined the role of a citizen's group in attributions of blame related to air pollution concerns. This study found that the blaming process had both positive and negative effects on the goals of the group. For example, blame was instrumental in forming and organizing the group but interfered with progress toward addressing issues of interest. Finally, studies by Hans, Nigg, and D'Souza (1994) and Nigg and Hans (1995) examined attributions of responsibility toward government entities following natural and technological disasters. In these studies, participants read scenarios describing disaster situations that were of either a natural or technological origin and responded to questions about moral and ethical responsibility. The studies found that participants consistently rated technological disasters as more severe although the severity of impact in the scenarios was intended to be equated. In addition, more blame was assigned in the case of technological disasters. These studies also found that, while all levels of government were held responsible for

disaster relief and mitigation, the greatest responsibility was attributed to local governments and the least was assigned to the federal government. In addition, these studies found that the severity of impact was not strongly related to attributions of responsibility and that, in some cases, moderate impact was associated with more blame than was severe impact.

Rationale for Present Study

While theory and research in the areas of community justice, disasters, and organizational fairness share some common antecedents and often address similar topics, none of the literature to date has explicitly attempted to explore the intersection of these related fields. The present study applied concepts from organizational justice theories to citizens' personal adjustment and perceptions of fairness and accountability in the wake of a local disaster. This study sought to expand the field of justice from the business world to the public domain and to provide a theoretical framework for examining both community justice and disaster response and recovery.

More than two and one-half years passed between the date of the flood and the time of data collection; however, several reasons may be posited for undertaking this study after this substantial amount of time had elapsed. First, interactions between residents and the City transpired over much of the intervening time. Recognition of the effects of the flood in the community as a whole was also ongoing. For example, both the rainfall protection revision and the erection of a memorial took place during the summer of 1999. In addition, a group of students at Colorado State University recently created a documentary film about the flood (Henley, 1999). Thus, although the event itself occurred over two and one-half years before the present data was collected, the effects

appear to be lasting. This phenomenon is consistent with evidence from the Buffalo Creek and Big Thompson floods, as well as other traumatic events, that the effects of disasters can be long lasting (Erikson, 1976a; Green et al., 1990; Green, et al., 1994; Miller, 1977) and that the events themselves become points of reference in the lives of those affected and merit ongoing consideration (Raphael, 1986). Finally, although not addressed by any study variables, the opportunity to talk about flood experiences may have provided an additional avenue of support for the recovery of the participants (Pennebaker, 1990).

Predictor variables included event impact (self-reported financial and relative damage and degree of life disruption), outcome (compensation) fairness, and procedural (voice, ethics, consistency, and accuracy), interpersonal (respect, remorse, concern, and sensitivity), and informational fairness (quality of explanations). These variables were drawn from community justice, disaster research, and organizational psychology. Outcome variables included personal adjustment (self-reported levels of stress symptoms) and evaluations of the City and were drawn from the disaster literature and organizational psychology. Individual survey items related to personal adjustment were based on symptoms associated with stress, anxiety, depression, and PTSD as described in the Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV, American Psychiatric Association, 1994). Evaluations of City authorities were based on social and organizational psychology and included anger, trust (confidence in future interactions), attributions of responsibility (accountability), and satisfaction with the relief and mitigation provided (outcome satisfaction).

Current Hypotheses

The present study applied several of the concepts described above to the interactions between residents of certain Fort Collins neighborhoods that experienced flood damage during the summer of 1997 and City authorities responsible for stormwater drainage and flood mitigation. The community justice literature suggests that anger and blame toward the City by neighborhood residents is likely to be related to the interpersonal treatment of residents by the City. This literature also suggests that satisfaction with flood compensation decisions should be related to the use of constructive processes. Research on disasters suggests that input by residents into the decision-making process should reduce anger and distrust related to the flood, and research on stress responses suggests that the impact of the event as well as social support and perceived control should affect residents' stress levels. Organizational psychology (see Folger & Cropanzano, 1998) suggests that impact severity as well as procedural, interpersonal, and informational fairness should be related to evaluations of the City and that outcome fairness should be positively related to outcome satisfaction. When the predictions from these fields were considered together, the following hypotheses were generated (a schematic model is presented in Figure 1):

Hypothesis 1a: Retrospective, self-reported stress (during the first year after the flood) should be positively related to the level of impact (self-reported amount of damage suffered) and negatively related to perceptions of procedural, interpersonal, and informational justice involving interactions with the City.

Hypothesis 1b: Comparative stress (stress at time of data collection as compared with stress during the first year after the flood) should be negatively related to the level of

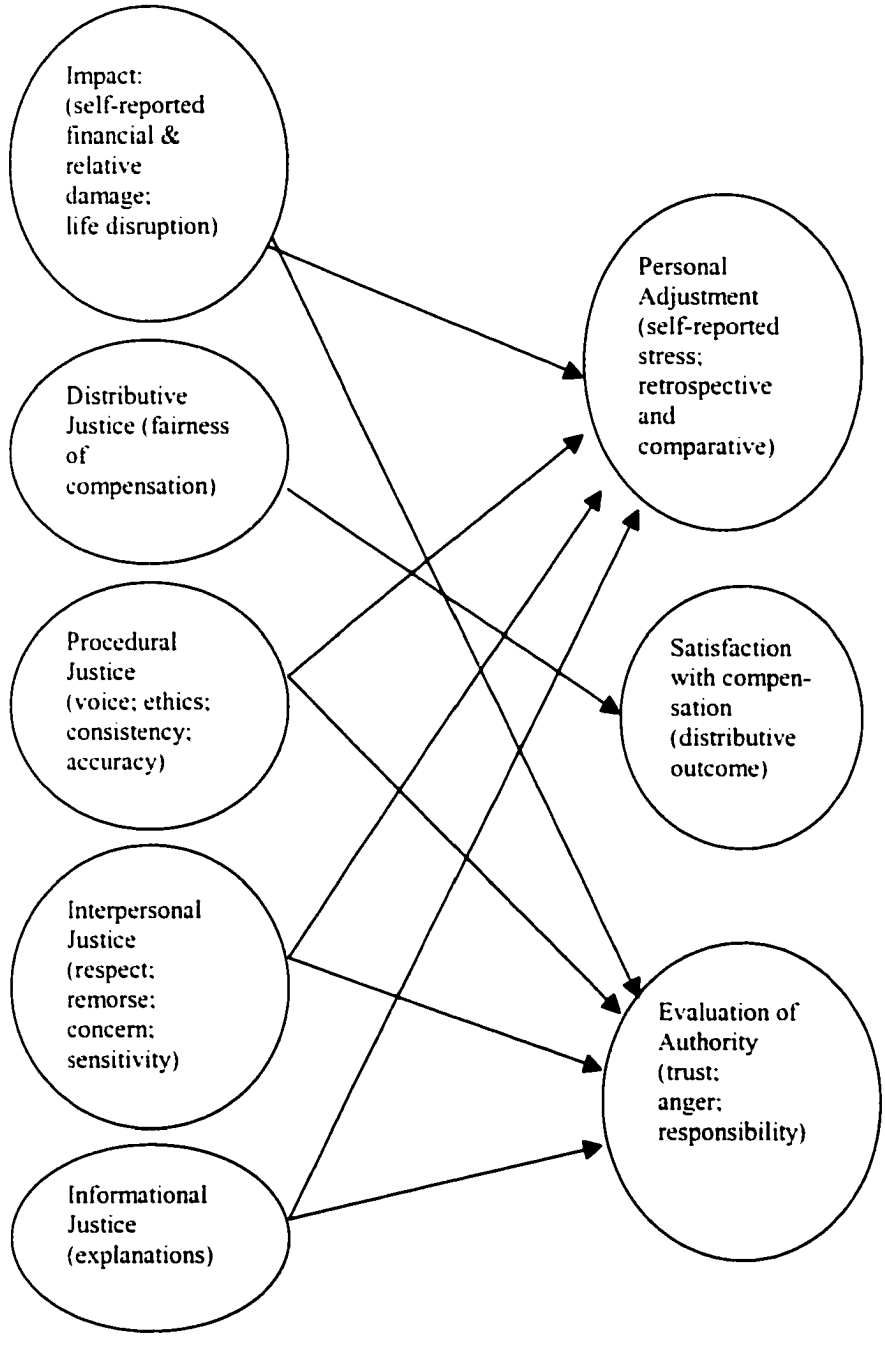

Figure 1: Schematic diagram of proposed model

impact (self-reported amount of damage suffered) and positively related to perceptions of procedural, interpersonal, and informational justice involving interactions with the City.

Hypothesis 2: Evaluations of the City (trust, anger, and attribution of responsibility) should be negatively related to the level of impact and positively related to perceptions of procedural, interpersonal, and informational justice.

Hypothesis 3: Satisfaction with compensation (relief and mitigation) should be positively related to distributive justice (compensation received).

Chapter II

Method

Participants

The participants were 103 residents from neighborhoods in southwest Fort Collins that were located along two stormwater drainage channels and associated irrigation ditches who were affected by varying degrees of flood damage during the storm of July 28, 1997. Other potential respondents throughout the city were affected by flooding and suffered considerable losses, but were not included in the study because their neighborhoods were not similarly located. Neighborhoods were selected on the basis of floodplain, stormwater drainage, flood damage, and street maps that were available in the public domain (Grigg et al., 1997; http://horton.eng2.uconn.edu/FortCollins/Pictures/6/collins.jpg). Participants were recruited from lists of property owners in these neighborhoods that were available at the county website (http://www.co.larimer.co.us/depts/assess/query/search.cfm). Telephone numbers were obtained from the local telephone directory and respondents were screened to verify that they were property owners, 18 years of age or older, and had experienced the effects of the 1997 flood in their neighborhoods. Of 389 properties that were identified in the neighborhoods of interest, 168 had unlisted phone numbers and were not included in the study. Of the remaining 221 properties, 5 numbers had been disconnected and 13 potential participants were not accessible by phone. Among the remaining 203

potential participants, 18 declined to participate due to lack of interest, 21 indicated that they were not affected by the flood, 38 did not live in the neighborhood during the time of the flood, 8 stated that they did not have time to participate, 7 reported personal difficulties such as health problems or language barriers that would interfere with their ability to complete the interviews, and 8 owned multiple properties in the neighborhood.

One hundred and three individuals, or 51% of those contacted by phone, met the inclusion criteria for the study and agreed to participate. These participants included 44 males and 59 females. The median age group of the participants was in the range of 35 – 44 years. Seventy percent of the participants were married, 14% were single, 14% separated or divorced, and 2% widowed. The median range of property values among survey participants was $130,000 to $159,000, and participants had lived in their neighborhoods for an average of 13 ½ years. Of the 103 interviews completed, three were not included in the final analysis due to the large number of items the participants declined to answer. Consequently, a total of 100 interviews were analyzed.

Design and Procedures

The study involved a telephone survey of a non-random sample of property owners in the neighborhoods of interest. The telephone calls were made by the investigator. Data were collected over a two month period during the spring of 2000. Questionnaire items related to predictor variables addressed self-reported event impact (financial and relative damage and life disruption) and justice: distributive fairness (compensation received), process fairness, interpersonal fairness, and quality of explanations (informational fairness). The outcome variables included retrospective, self-reported stress levels for the first year after the flood, comparative stress (recent stress,

relative to to the first year after the flood), and evaluations of the City (trust, anger, attribution of responsibility), and satisfaction with compensation received in the form of relief and mitigation.

The survey began with a prepared script introducing the investigator and the purpose of the project and included information regarding voluntary participation, time commitment, confidentiality, termination of participation, potential benefits and risks, whom to contact for further information, and the opportunity to obtain study results (see Appendix). The interviews took about 15 - 20 minutes for most participants to complete, although some participants added comments that took longer. No follow-up calls were made regarding questionnaire items. Some individuals, however, requested the opportunity to participate in the survey at a more convenient time and in thoses cases repeat calls were made in order to accommodate the participants. Completed surveys contained no identifying information. Referrals for counseling were offered; however, none of the respondents expressed interest in this offer.

Survey Items

A copy of the telephone interview schedule is included in the Appendix.

Stress outcome measures. The questions in the first section asked about the levels of stress experienced by the respondents since the flood. These items were derived from DSM-IV (1994) criteria for several stress-related disorders including depression, anxiety, and PTSD. Respondents were first asked to retrospectively rate the degree of difficulty they experienced with each of these symptoms during the year immediately after the flood (items RS1 – RS9) on a scale of 0 ("no difficulty") to 10 ("extreme difficulty"). They were then asked to compare their recent levels of these symptoms to their stress

during the first year (items CS1 – CS9). In order to maintain consistency with the severity ratings on the retrospective stress scale, the anchors on this 5-point Likert-type scale ranged from 1 = Much Better to 5 = Much Worse; consequently, a lower number refers to an improvement in stress over time whereas a higher number indicates increased stress over time.

Meaures evaluating the City. The second section of the questionnaire addressed evaluations of the City. The eight items on this scale were derived from Byrne (1999) and included relief and mitigation satisfaction (items E1 and E2), attribution of responsibility (items E3 and E4), trust (items E5 and E6), and anger (items E7 and E8). This scale was originally comprised of nine items; however, a third satisfaction item stating, "In my neighborhood, flood relief and repair bore no relation to what the residents deserved," was eliminated from the questionnaire after a few administrations due to the substantial difficulty participants reported in responding to that item. The remaining items were administered in a branching format in order to reduce participant confusion (Weisberg, Krosnick, & Bowen, 1996). In the branching format, respondents were first asked to report whether they agreed or disagreed with the item statement and were subsequently asked to rate the strength of their agreement or disagreement according to the categories "slight," "moderate," or "strong." This administration resulted in a 6-point Likert-type scale with anchors of 1 = Strongly Disagree (most negative evaluation) to 6 = Strongly Agree (most positive evaluation), except for items E2, E4, and E7, which were reverse-scored.

Impact predictors. The self-reported amount of financial damage was assessed by asking respondents to estimate the total amount of damage in dollars that they sustained

as a result of the flood. Relative damage was measured by asking respondents to rate how much damage they had compared with their neighbors. These responses were measured on a 5-point Likert-type scale with anchors of 1 = Much Less and 5 = Much More. Finally, life disruption was assessed by asking respondents to rate the amount of disruption they experienced after the flood on a 4-point scale. The possible responses on this scale included: 1 = None, 2 = Somewhat, 3 = Moderate, and 4 = Almost completely for awhile.

Justice predictors. Questionnaire items addressing organizational justice were derived from measures developed by Byrne (1999) and used by permission. The 16 items comprising this scale included relief and mitigation fairness (items J1 & J2), process fairness (voice = J3 & J4; ethics = J5 & J6; consistency = J7; accuracy = J8 & J9), interpersonal fairness (respect = J10 & J11; sensitivity = J12 & J13; apology = J14), and informational fairness (items J15 & J16). This scale was originally comprised of 17 items; however, an additional consistency (procedural justice) item was eliminated from the questionnaire after several of the early respondents reported difficulty understanding and responding to it. The discarded item stated, "The City used sound, consistent procedures in addressing relief and repair issues after the flood." Administration of the remaining items followed the same procedures as the evaluation of the City scale and resulted in a 6-point Likert-type scale with anchors of 1 = Strongly Disagree and 6 = Strongly Agree. Item J9 was reverse-scored.

Following the administration of the survey items, participants were asked two open-ended questions to offer them the opportunity to address relevant issues not covered by the survey and to ask the investigator about any questions they had about the study.

Demographic information including age group, gender, marital status, length of residence in neighborhood, and range of property values for homes in their immediate neighborhood was also requested for descriptive purposes.

Chapter III

Results

Scales

In light of theoretical considerations of different dimensions of justice (distributive, procedural, interpersonal, and informational; see Colquitt, 2000), it was originally expected that these forms of justice would be perceived differently and would operate differentially as predictors. Upon examination of the data, however, it was found that these measures were all correlated at .70 or higher. Despite these correlations and in accordance with theory, outcome fairness (distributive justice) was considered as a separate measure. However, the remaining dimensions (procedural, interpersonal, and informational) were found to correlate at .75 or higher with a Cronbach's alpha of .92 and were used as a single predictor. As a result, the two justice predictors used were a distributive justice scale (FAIR; interview items J1 and J2) and a composite justice scale comprised of the procedural, interpersonal, and informational justice items (PII; interview items J3 – J16).

The individual components of the City Evaluation Scale (trust, anger, and attributions of responsibility) were not represented as distinct outcome variables in the original model. It had, however, been anticipated that upon analysis they might emerge as unique factors that would operate differentially as outcome measures. Since these measures were all correlated at .60 or higher and since the Cronbach's alpha for these

measures was .81, suggesting a single factor, it was concluded that these evaluation measures did not operate differentially. Consequently, they were used as a single outcome measure. Based on theoretical considerations, however, satisfaction with compensation was considered separately. Consequently, evaluation of the City (EVAL; interview items E3 – E8) and outcome satisfaction (SATISF; interview items E1 and E2) were the two evaluation outcome measures.

With respect to the stress measures, the items comprising the two original scales, retrospective stress for the first year after the flood (RSTRESS; interview items RS1 – RS9) and recent stress, as compared with the retrospective level (CSTRESS; interview items CS1 – CS9), were found to be correlated at .61 or higher within their respective scales, with the exception of three items (CS1, CS3, and CS9) which were correlated less strongly (.52, .55, .59, respectively) within the comparative stress scale. However, since the Cronbach's alphas of these scales were .93 (RSTRESS) and .88 (CSTRESS), it appeared that these two measures could reliably be considered as single factors and were used as originally constructed.

Finally, the low correlations (.60 or lower) and the extremely low Cronbach's alpha (.00) among the three impact measures,self-reported financial impact, relative impact, and life disruption, suggested that these should be considered separately. Since the content of the relative impact measure was similar to theself-reported financial impact measure, it was decided not to use relative impact in the final analysis. Consequently,self-reported financial impact (IMPACT x$1000; item I1) and life disruption (DISRUP; item I3) were the two outcome scales used to measure flood impact.

Descriptive Statistics

Table 1 displays the means, standard deviations, correlations, and Cronbach's alpha values of all variables.

Table 1

Descriptive Statistics and Correlation Matrix for Study Variables

Variable	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) IMPACT (xS1000)	12.18	20.32	--							
(2) DISRUP	3.22	0.90	0.43**	--						
(3) PII	3.72	1.25	-0.35**	-0.38**	(.86)					
(4) FAIR	3.74	1.73	-0.22*	-0.34**	0.78**	(.95)				
(5) RSTRESS	2.97	2.60	0.59**	0.63**	-0.43**	-0.47**	(.93)			
(6) CSTRESS	2.28	0.65	-0.39**	-0.46**	0.16	0.25*	-0.62**	(.88)		
(7) EVAL	3.23	1.41	-0.33**	-0.39**	0.80**	0.78**	-0.47**	0.16	(.87)	
(8) SATISF	3.47	1.69	-0.36**	-0.36**	0.76**	0.73**	-0.49**	0.14	0.78**	(.70)

Note: n=100, *p < .05, **p < .01

The Cronbach's alpha values were all .86 or above, except for satisfaction (Cronbach's alpha = .70), indicating homogeneity within the measures. Consequently, for each of the multiple-item scales listed above, the mean of the individual responses was used as an index.

Tests of Hypotheses

Hypothesis 1a stated that retrospective stress (self-reported level for the first year after the flood) would be positively related to the self-described level of flood impact and negatively related to procedural, interpersonal, and informational justice received from the City. The values from the resulting linear regression equations are presented in Table 2. This analysis supported the first hypothesis. The omnibus test of this hypothesis was found to be significant, $F(3,97) = 39.59$, $p < .0001$. The results show a positive relationship between retrospective stress reported retrospectively (RSTRESS) and the two impact measures, self-reported financial impact (IMPACTxS1000), $t(97) = 4.52$, $p < .0001$, and life disruption (DISRUP), $t(97) = 5.23$, $p < .0001$, and a negative relationship between retrospective stress and procedural, interpersonal, and informational justice (PII), $t(97) = -2.42$, $p < .05$. This analysis indicates that the retrospectively reported stress level of the average respondent during the first year after the flood was 2.94 (on a scale of 0 = no stress to 10 = extreme stress) when reported financial impact, life disruption, and justice were at their mean values ($12,176, 3.22, and 3.72, respectively). For every $1000 increase in self-reported financial impact, retrospective stress increased by 0.04 units over and above the effects of life disruption and perceived justice. In addition, for every unit increase in life disruption (on a scale of 1=none to 4=almost completely for awhile), stress increased by 1.20 units over and above the effects of financial impact and perceptions of justice. Thus, both self-reported financial impact and life disruption were related to retrospectively reported elevations in level of stress for the year following the flood. Finally, for every unit increase in perceived justice (on a scale

Table 2

Summary of Multiple Regression Analyses of Original Hypotheses

Variables	β	B	df	F	t	R^2
Hypothesis 1a						
Dependent variable: RSTRESS (stress during 1st year after flood, retrospective)						
Full Model			3	39.59****		.56
Intercept	0	2.94				
IMPACT[a]	0.35	0.04	1		4.52****	.13
DISRUP	0.41	1.20	1		5.23****	.40
PII	-0.18	-0.38	1		-2.42*	.03
Hypothesis 1b						
Dependent variable: CSTRESS (comparative stress, at time of data collection)						
Full Model			3	10.94**		.26
Intercept	0	2.28				
IMPACT[a]	-0.22	-0.007	1		-2.17*	.04
DISRUP	-0.35	-0.26	1		-3.47***	.22
PII	0.05	0.02	1		0.46	.002
Hypothesis 2						
Dependent variable: EVAL						
Full Model			3	50.87****		.62
Intercept	0	3.23				
IMPACT[a]	-0.03	-0.002	1		-0.38	.001
DISRUP	-0.10	-0.16	1		-1.37	.01
PII	0.73	0.82	1		10.34**	.61
Hypothesis 3						
Dependent variable: SATISF						
Full Model			1	135.26****		.58
Intercept	0	3.47				
FAIR	0.76	0.74	1		11.63****	.58

Note: n=100; *p<.05; **p<.01, ***p<.001, ****p<.0001; [a] IMPACT = IMPACTx$1000
Independent variables were analyzed in mean deviation form ($X_i - \bar{X}$)

of 1=most unfair to 6=most fair), retrospective stress decreased by 0.38 units over and above the effects of the impact variables. An inspection of the partial R^2 values for this model reveals that disruption accounted for 40% of the shared variance in this model, reported financial impact for 13%, and justice for 3% of the shared variance.

Hypothesis 1b stated that comparative stress (CSTRESS; self-reported recent stress, as compared to the retrospective level) would be negatively related to self-reported financial impact and life disruption and positively related to perceived justice. The values for the linear regression equation for this hypothesis are presented in Table 2. The omnibus test of this hypothesis was significant, F (3,97) = 10.94, $p < .0001$. Contrary to predictions, these results indicated a positive relationship between impact and comparative stress. While the parameter estimates of the two impact variables in this analysis are negative, the direction of the CSTRESS scale, as described in Chapter II (1=greatest improvement to 6=least improvement), means that a lower rating represents a greater reduction in stress over time. Consequently, while self-reported financial impact (IMPACTxS1000), t (97) = -2.17, $p < .05$, and life disruption (DISRUP), t (97) = -3.47, $p < .001$, were significantly related to comparative stress, this relationship was in the opposite direction of the hypothesis. However, this may represent a floor effect in that those who reported low impact and low retrospective stress would have little room for improvement over time. In addition, the model did not support the hypothesized relationship between comparative stress and perceived justice (PII), t (97) = 0.46, n.s. The reported level of comparative stress at the time of data collection for the average respondent was 2.28 (on a scale of 1 = Much Better to 5 = Much Worse) when self-reported financial impact, life disruption, and perceived justice were at their mean values.

In this analysis, for every $1000 increase in reported financial damage, the level of comparative stress was reduced (representing an improvement in overall stress level) by 0.007 units over and above the effects of life disruption and perceptions of justice. In addition, for every unit increase in life disruption, the level of comparative stress was reduced by 0.26 units (representing an improvement in stress level) over and above the effects of reported financial impact and perceived justice. Consequently, and contrary to predictions, individuals with higher levels of reported financial impact and life disruption reported more improvement in stress symptoms over time whereas justice was not significantly related to comparative stress. In this model, life disruption accounted for 22% of the shared variance and reported financial impact for 4 %.

In light of the strong correlation (.78) between the distributive justice (FAIR) and other justice (PII) measures, hypotheses 1a and 1b were also tested with a justice measure that included all four justice components (distributive, procedural, interpersonal, and informational); however, these tests did not differ appreciably from the results described above with respect to the F-statistics or parameter estimates. Consequently, the above tests were used in order to maintain consistency with the original predictions.

Hypothesis 2 stated that evaluations of the City would be negatively related to the level of flood damage sustained and positively related to procedural, interpersonal, and informational justice (PII) received from the City. The resulting linear regression equation is summarized in Table 2. The omnibus test for this hypothesis was found to be significant, $F(3,97) = 50.87$, $p < .0001$. This analysis supported the hypothesized relationship between evaluations and perceived justice (PII), $t(97) = 10.34$, $p < .0001$, but did not support the hypothesized relationship between evalutions and reported

financial impact (IMPACTxS1000), t (97) = -0.38, n.s., or life disruption (DISRUP), t (97) = -1.37, n.s. The average evaluation of the City was 3.23 (on a scale of 1 = most negative evaluation to 6 = most positive) when reported financial impact, life disruption, and perceived justice were at their mean values. With each unit increase in perceived justice, evaluations increased 0.82 units over and above the effects of the two impact variables. Justice accounted for 61% of the shared variance in this model.

Hypothesis 3 stated that satisfaction with compensation would be positively related to fairness (distributive justice). The model for this hypothesis is shown in Table 2. The result of this analysis, t (98) = 11.63, $p < .0001$, supports the hypothesis that outcome satisfaction would be related to perceived distributive fairness. The level of satisfaction was 3.47 (on a scale of 1 = Strongly Disagree, or least satisfied, to 6 = Strongly Agree, or most satisfied) for individuals at the average level of fairness (FAIR= 3.74 on a scale of 1 = Strongly Disagree, or least fair, to 6 = Strongly Agree, or most fair). For each unit increase in fairness, satisfaction improved by 0.74 units. Evaluation of the City accounted for 58% of the variance in this model.

Post-Hoc Comparisons

Following the analysis of the original hypotheses, four additional relationships were considered. The relationship between justice (PII) and retrospective stress (RSTRESS), with the impact variables omitted from the analysis, and the relationship between evaluation of the City (EVAL) and retrospective stress (RSTRESS) were examined as simple correlations that are presented in Table 3. Two other comparisons were also considered in an effort to examine whether satisfaction with compensation (SATISF) might function as a mediator between reported flood impact (IMPACTxS1000

and DISRUP) and the remaining outcome variables: retrospective stress (RSTRESS) and evaluations of the City (EVAL). The values for these linear regression equations are presented in Table 3.

The analysis of the relationship between justice (PII) and retrospective stress (RSTRESS) was found to be significant, t (97) = -5.21, $p < .0001$, supporting the proposed relationship between perceived justice and decreased levels of reported stress. The results indicate that the average level of reported stress during the first year after the flood was 2.97 (on a scale of 0 = no stress to 10 = extreme stress) for individuals at the average level of perceived justice (3.72 on a scale of 1 = Strongly Disagree, or least fair, to 6 = Strongly Agree, or most fair). For each unit increase in perceived justice, the level of retrospective stress decreased by 0.97 units. In this analysis, perceived justice accounted for 21% of the variance.

The relationship between retrospectively reported stress (RSTRESS) and evaluations of the City (EVAL) was also found to be significant, t (99) = -5.32, $p <$ .0001. Thus, individuals who retrospectively reported no stress ("0" on a scale of 0 = no stress, to 10 = extreme stress) during the first year after the flood rated the City at 3.99 on a scale of 1 (Strongly Disagree, or most negative evaluation) to 6 (Strongly Agree, or most positive evaluation). For each unit increase in retrospective stress, the evaluation rating decreased by 0.26 units, with stress accounting for 22% of the variance. Consequently, the City was rated more negatively by individuals who reported higher stress levels for the year following the flood.

The possibility that satisfaction with compensation (SATISF) might function as a mediator between impact (IMPACTxS1000 and DISRUP) and retrospective stress

Table 3

Summary of Multiple Regression Analyses of Post-Hoc Tests

Variables	β	B	df	F	t	R^2
Post-Hoc Hypothesis 1						
Dependent variable: RSTRESS						
Full Model			1	25.96****		.21
Intercept	0	2.97				
PII	-0.47	-0.97	1		-5.21****	.21
Post-Hoc Hypothesis 2						
Dependent variable: EVAL						
Full Model			1	28.28****		.22
Intercept	0	3.99				
RSTRESS	-0.47	-0.26	1		-5.32****	.22
Post-Hoc Hypothesis 3						
Dependent variable: RSTRESS						
Full Model			3	41.45****		.57
Intercept	0	2.94				
IMPACT[a]	0.34	0.04	1		4.40****	.13
DISRUP	0.41	1.19	1		5.33****	.40
SATISF	-0.22	-0.33	1		-2.92**	.04
Post-Hoc Hypothesis 4						
Dependent Variable: EVAL						
Full Model			3	51.63****		.62
Intercept	0	3.23				
IMPACT[a]	-0.01	-0.001	1		-0.17	.0001
DISRUP	-0.13	-0.20	1		-1.76	.02
SATISF	0.73	0.61	1		10.43****	.60

Note: n=100; *p<.05, **p<.01, ***p< .001, ****p< .0001; [a]IMPACT = IMPACTxS1000; PII, IMPACT, DISRUP, and SATISF were analyzed in mean deviation form ($X_i - \bar{X}$)

(RSTRESS) or between impact and evaluations of the City (EVAL) was initially explored in two stepwise analyses that forced the non-significant variables into the

model. The results of these stepwise analyses did not improve the models and did not support the *post-hoc* hypotheses that satisfaction might function as a mediator; however, simple correlations between satisfaction and reported stress and between satisfaction and evaluations of the City were found to be significant when impact was held constant. Since the stepwise analyses did not improve the models or reveal a mediating role for satisfaction, only the results of the linear regression equations for the full models are reported in Table 3 for these comparisons.

The omnibus test of the relationship between satisfaction (SATISF), impact (IMPACTxS1000 and DISRUP), and retrospective stress (RSTRESS) was significant, F (3,97) = 41.45, $p < .0001$. The results of this linear regression analysis indicated that the level of retrospective stress for individuals at the average levels of reported financial impact, life disruption, and satisfaction with compensation was 2.94 on a scale of 0 = no stress to 10 = extreme stress. For each unit increase in reported financial impact (IMPACTxS1000), t (97) = 4.40, $p < .0001$, reported stress for the first year after the flood increased by 0.04 units, over and above the effects of life disruption and satisfaction with compensation. For each unit increase in life disruption (DISRUP), t (97) = 5.33, $p < .0001$), stress increased by 1.19 units over and above the effects of reported financial impact and satisfaction, and for each unit increase in satisfaction with compensation (SATISF), t (97) = -2.92, $p < .01$, retrospective stress decreased by 0.33 units over and above the effects of reported financial impact and life disruption. Consequently, as previously found in Hypothesis 1a, individuals who reported greater financial impact and life disruption also reported greater stress when retrospectively rating the level of stress they experienced during the first year after the flood. Satisfaction

with compensation, however, was associated with lower levels of retrospectively reported stress. In this model, reported financial impact accounted for 13% of the shared variance, life disruption for 40%, and satisfaction with compensation for 4% of the shared variance.

Finally, the omnibus test of the relationship between satisfaction with compensation (SATSIF), impact (IMPACTxS1000 and DISRUP), and evaluations of the City (EVAL) was found to be significant, F (3,97) = 51.63, $p < .0001$. This linear regression analysis revealed a significant positive relationship between satisfaction and evaluations (SATISF), t (97) = 10.43, $p < .0001$. As in Hypothesis 2, however, neither reported financial impact (IMPACTxS1000), t (97) = -0.17, n.s., nor life disruption (DISRUP), t (97) = -1.76, n.s., was significantly related to evaluations of the City. In this model, for each unit increase in satisfaction, evaluations increased by 0.61 units (on a scale of 1=Stongly Disagree, or least favorable, to 6=Strongly Agree or most favorable) when reported financial impact and life disruption were held constant, and satisfaction accounted for 60% of the shared variance. Thus, respondents who reported greater satisfaction with the compensation they received also evaluated the City more favorably.

Anecdotal Information

In addition to the quantitative results described above, many of the completed interviews contained unsolicited comments that merit attention. Several themes were noted in these comments and some themes were repeated in up to one-fifth of the surveys. Comments were made in the areas of stress, evaluations of the City, and recommendations both for the City and for future studies.

With respect to stress, 20% of respondents indicated that they continue to experience recurrent anxiety during the rainy season although for some the anxiety was reported to have diminished over time. Fewer than 5% mentioned noticing the effects of anxiety on their children or pets. Nearly 10% indicated that their symptoms were related to observing their neighbors' losses, although their own were minimal. Nine percent of the respondents attributed longer term effects on health, including two deaths, and fewer than 5% noted declines in neighborhood stability after the flood. About 5% of the respondents indicated that recurrent thoughts or memories associated with the flood had the effect that "it's still with us." Eight percent of the respondents, however, noted that neighbors "pulled together" after the flood and offered social support that increased a sense of community.

In addition to comments about stress symptoms, a number of respondents added comments pertaining to the evaluations of City authorities. Although 15% of those surveyed mentioned attending meetings with City personnel after the flood, about 20% of the surveys indicated that the City did not actively seek neighborhood input, did not seem sincere in its concerns for the neighborhoods, and took action "only when coerced" by residents: "We had to beat it out of them." Twenty percent of the surveys also contained remarks about lack of adequate planning for growth and development, failure to provide adequate drainage in the face of rapid growth, and failure of the City to resist pressure from developers. Nine percent expressed distrust or anger with the City, for example, "I have been left with a general distrust of how City officials look after the best interests of the citizens." Twelve percent of the respondents expressed frustration that the City had ignored safety warnings and complaints prior to the flood and had "dropped the ball."

Fewer than 5% remarked on the limited visibility of City personnel in their neighborhoods after the flood. The comment, "to have somebody from the City come and talk to you; to sit on the front porch and look you in the eye and just be human would have made all the difference" reflects this concept. Eight percent of the respondents remarked that the City had failed to take responsibility or to apologize for their part in the damage stating, for example, "If they had the attitude that 'we made a mistake and what can we do to make it right,' it would have felt so much different." The comment, "I was very unimpressed with the City in terms of accountability and empathy" reflected the constructs of interest in the present study.

Other evaluative comments, however, were more positive in nature. Nine percent of the respondents differentiated between their experiences with different City personnel, indicating that some appeared more sincere or more trustworthy than others. Six percent indicated that the City's response appeared to have improved over time or that, while more improvements could have been made, at least the City had made an effort. Other surveys contained more positive evaluations of the City. For example, 12% of the respondents indicated that the City could not have foreseen or prevented the flood and was not responsible for damages. About 5% of these respondents stated that residents may have been looking for someone to blame for their losses and targeted the City. Five percent of the respondents also stated that they were "happy with [the City's response]" and that "the City did a fine job," "they really tried," "they seemed very sincere," "they were very available," "in larger cities [than Fort Collins] I know what it's like to feel ignored by the government."

Twelve percent of the respondents had suggestions for ways that the City could improve its disaster preparedness and response. These included having a better warning system, reevaluating the drainage system and the growth plan, resisting pressure from developers, and forming a "non-government citizen committee" to ensure that relief funds are fairly distributed, and making safety improvements because "even if it won't affect us; it will affect others in the future." About 5% of the participants recommended that the City see the results of this study.

Finally, several respondents made suggestions for future studies. These included 4% of respondents who suggested rewording some survey items to appear more neutral, although these comments were evenly divided between individuals who held opposing views concerning the direction of perceived bias of the items in question. In addition, 16% of those surveyed indicated that other agencies, such as the Federal Emergency Management Administration (FEMA), the Red Cross, and insurance agencies, should be included in order to compare and contrast their responses to residents.

Chapter IV

Discussion

This paper drew on concepts from three fields of study: community justice, which has applied methods of constructive conflict resolution to a variety of community conflict situations; disaster research, which has examined the effects of natural and technological disasters on individuals and communities; and organizational psychology, which has explored the effects of fair treatment by authority figures on the satisfaction of the affected parties and their evaluations of relevant authorities. While justice has frequently been examined within the context of the business world (Folger & Cropanzano, 1998), few studies have applied this concept to other settings. In addition, no known study has attempted to merge concepts from these three fields.

This study examined the experiences of 100 individuals who were affected by the Fort Collins, Colorado, flood of 1997. The participants were recruited from neighborhoods along stormwater drainage channels and nearby irrigation ditches where flooding occurred as a result of drainage system overflows rather than from creek flooding. The study had two primary purposes: 1). to apply principles from organizational psychology's theories of justice to a community rather than business setting, and 2). to examine whether perceptions of justice would relate to levels of stress as well as evaluations of City authorities. Although it had originally been hoped that individual justice factors (distributive, procedural, interpersonal, and informational) would

differentially predict various components of the evaluation of the City outcome measures (trust, anger, and accountability), no individual factors were found in these scales and the measures were used as single factors.

From a descriptive perspective, study respondents were found on average to have experienced low to moderate stress during the first year after the flood and to have experienced moderate improvement in stress symptoms over time. The average respondent evaluated the City in a slightly negative light and was slightly dissatisfied with flood compensation. The average respondent suffered somewhat more than $12,000 damage and reported considerable life disruption as a result of the flood. Finally, respondents, on average, reported feeling that they were treated somewhat unfairly by the City.

The results of the analyses supported the proposed relationships between retrospectively reported post-flood stress and impact, retrospective stress and justice, and evaluations of the City and justice. Due to the non-experimental nature of the study, however, it is not possible to make assumptions about causal relationships among these variables. The results, however, did not support the proposed relationships between comparative stress (stress at the time of data collection as compared with retrospective stress level) and justice or between impact and evaluations of City authorities. In addition, the analysis showed a significant relationship between impact and comparative stress in the opposite direction from the hypothesis that is likely to reflect a floor effect. A revised model based on study findings is provided in Figure 2. First, it was predicted that higher levels of stress would be associated with higher levels of impact and with lower perceptions of fairness. As predicted, financial damage and self-reported life

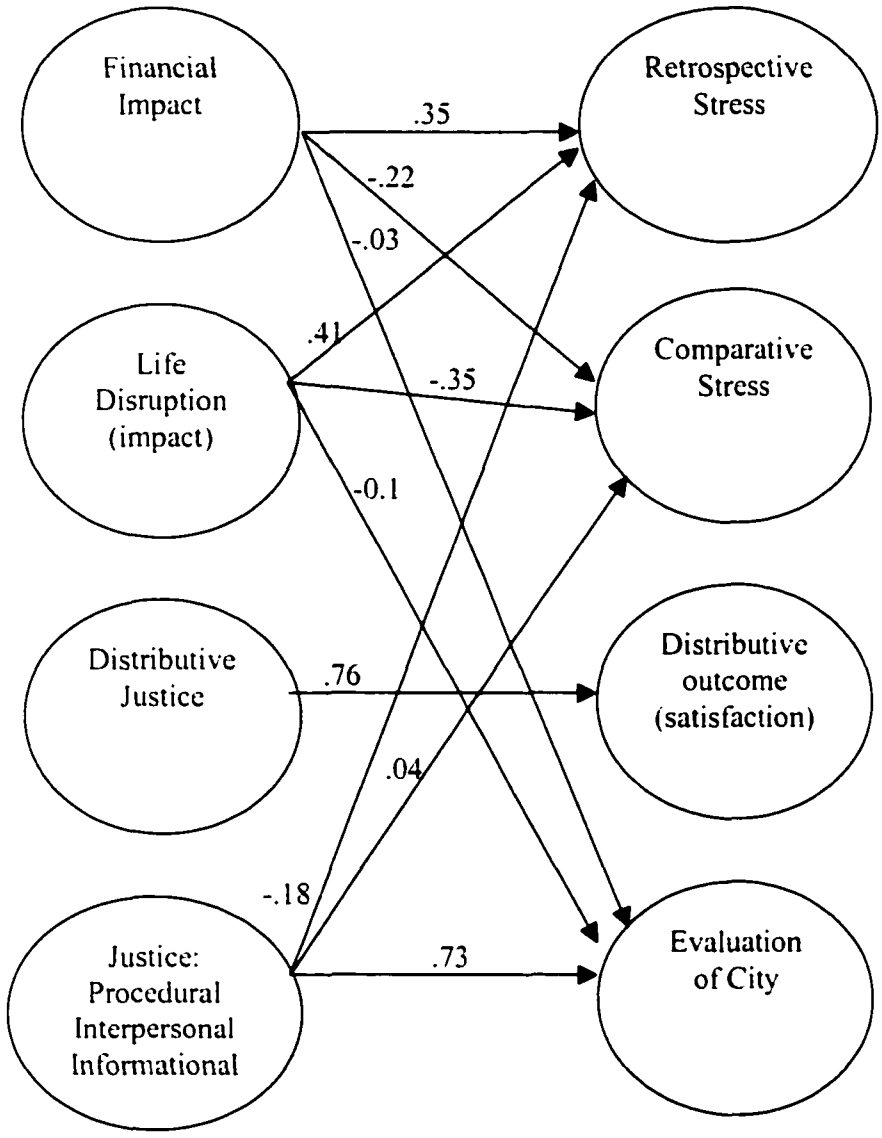

Figure 2: Schematic diagram of revised model

disruption were found to be positively related to self-reported levels of stress for the first year after the flood (Hypothesis 1a). This finding, consistent with prior research in the area of disasters, suggests that exposure to a disaster situation is significantly related to the increased stress levels of victims (Green et al., 1990; Green et al., 1994; Raphael, 1986). Contrary to predictions, self-reported financial damage and life disruption were

also positively related to recent stress, as compared with stress during the first year after the flood (Hypothesis 1b). While it was originally predicted that individuals reporting higher levels of impact would also report higher levels of stress over time, the analysis showed that those with the greatest impact at the time of the disaster experienced the greatest reductions in stress over time. It is likely that this finding reflects the fact that those with lower levels of impact also reported lower initial stress levels and consequently had more room for improvement over time. While this finding differs from the ongoing stress symptoms found among the Buffalo Creek survivors with the greatest impact (Green et al., 1990; Green et al., 1994), it is consistent with post-disaster research that shows improvements in the stress levels of disaster victims over time (Raphael, 1986). Nonetheless, the lengthiness of the stress-recovery process has been documented by Green and colleagues (1990; 1994) and by Miller (1977) and has been revisited in a recent newspaper article covering the healing process of the victims of the Fort Collins flood (Benson & Benanti, July 27, 2000). Thus, although respondents reported considerable improvements in stress over time, the recovery process appears to be ongoing. In addition, these results may reflect disparity in rating systems between the two stress scales and may also reflect the dissimilarity between the present respondents' impact (property) and the loss of life involved at Buffalo Creek.

In addition, as predicted, the study results showed a small but significant relationship between justice and retrospective stress over and above the effects of the impact variables (Hypothesis 1a). This suggests that the use of appropriate procedures, appropriate interpersonal treatment, and adequate information by community authorities after disaster situations is related to reduced stress levels among victims and may thus

enhance the recovery process, particularly in the early stages. In order to explore this relationship further, a *post-hoc* analysis of the relationship between justice alone and stress was performed. In this analysis, justice was found to have a significant correlation with reduced stress, thus lending insight into the small but significant relationship between justice and reduced retrospective stress over and above the powerful effects of the impact variables. While the application of the justice model to a community problem requires further testing, these preliminary results suggest that fair treatment of disaster victims by community authorities may be an important intervention during the early stages of disaster recovery.

Justice, however, was not found to affect respondents' levels of comparative stress (Hypothesis 1b). While this finding was contrary to prediction, it is likely that the length of time between the flood and the gathering of data, the ongoing recovery process, and the retrospective nature of the study interfered with any relationship that may have existed between justice and recent stress, as compared with retrospective ratings of stress during the first year after the flood. In addition, individual and community factors such as stress tolerance, interpretation of events, past disaster experiences, social support, and pre-flood neighborhood cohesion that were not accounted for in this study may be reflected in the results.

It was also predicted that positive evaluations of City authorities would be associated with lower levels of impact and with higher levels of perceived justice (Hypothesis 2). The predicted relationship between impact and evaluations was not supported by the data; neither actual impact nor life disruption was found to significantly affect evaluations of City authorities. Although this finding was contrary to predictions

based on Fairness Theory (Folger & Cropanzano, 1998), it was consistent with research by Hans, Nigg, and D'Souza (1994) and Nigg and Hans (1995) who found that impact had little effect on attributions of responsibility in hypothetical scenarios of disaster situations. The relationship between justice and evaluations of the City, however, was found to be significant, as predicted. While additional testing is needed, this finding is consistent with the results of numerous studies in the business world and provides preliminary support for the proposed application of organizational concepts as a useful theoretical framework for exploring processes and outcomes in non-business settings.

The third and final of the original hypotheses predicted a positive relationship between outcome satisfaction (compensation) and distributive fairness. Consistent with the large body of research in organizational psychology, this relationship was supported by the study data. Consequently, individuals who reported that post-flood decisions were made fairly were more likely to report satisfaction with the relief and mitigation efforts in their neighborhoods than were those who did not report that decisions were handled fairly.

Finally, in addition to the *post-hoc* analysis of the relationship between justice and retrospective stress when the impact variables were not included in the model, as described above, three further *post-hoc* analyses examined the relationships between the original dependent variables: retrospective stress, satisfaction with compensation, and evaluations of the City. The first of these analyses found a negative relationship between evaluations of the City and stress reported retrospectively for the first year after the flood. The two subsequent analyses explored the possibility that satisfaction with compensation (outcome satisfaction) might serve as a mediator between the impact variables (self-

reported financial impact and life disruption) and retrospective stress as well as evaluations of the City. While the concept of satisfaction as a mediator was not supported, these comparisons did yield a negative relationship between outcome satisfaction and retrospective stress and a positive relationship between outcome satisfaction and evaluations of the City. While these findings do not imply casual relationships among these variables, they do suggest that outcome satisfaction is associated with both reduced stress levels and positive evaluations of the City. The latter is consistent with accepted principles of organizational justice while the former supports the role of justice in stress reduction. Moreover, the results as a whole would appear to support the primary study objectives: the application of organizational justice models to non-business settings and the extension of justice variables to the study of post-disaster stress.

Following the quantitative analyses, anecdotal comments offered by respondents during the interviews were explored. Some of the prevalent themes of these comments included recurrent anxiety during rain storms, increased neighborhood cohesion, decreased confidence in City authorities, concerns about the adequacy of public utilities and planning for new developments, and recommendations for improved disaster preparedness and responses. In contrast to the concerns described above, additional themes reflected satisfaction with the City's response following the flood or noted improvements by the City since the flood.

Limitations of the Study

Several limitations exist which should be taken into account when interpreting the above results. These include concerns about the sample itself, the time elapsed between

the flood and the study, and measurement considerations. First, the non-random nature of the study and the small size of the sample may limit the generalizability of these results to other populations. The small sample size may also have interfered with the ability to detect differences among the components of the justice and evaluation scales. In addition, selection biases are likely to have occurred due to the large number (nearly half) of the potential respondents with unlisted telephone numbers or who were otherwise unable to be reached by phone. Furthermore, due to the length of time elapsed between the flood and the data collection period, many potential respondents had moved, thus further limiting the available pool of participants. The length of time between the flood and the study is also related to the retrospective nature of the study. Participants may have responded differently if the data had been collected sooner after the flood. For example, retrospective stress levels may not accurately reflect the stress that respondents actually experienced after the flood. In addition, retrospective reporting of the extent of financial impact and life disruption may be less accurate than would be desired. Consequently, conclusions based on these retrospective measures should made with caution.

Finally, some limitations related to measurement warrant consideration. Not only was the study retrospective in nature but also relied solely on self-report measures. In addition, the disparity of scaling between the two stress measures made comparison of these measures difficult. It would perhaps have been prudent to use the same 10-point rating scale for both retrospective and comparative stress levels. Also of concern is whether the various scales were sufficiently distinct to ensure that they measured discrete constructs. Furthermore, it is possible that the nature of the survey questions did not permit respondents to adequately describe their experiences. Finally, factors such as age,

gender, individual differences in temperament or stress tolerance, available social support, and other personal or cultural factors that were not held constant in the analyses may have contributed to the results but could not be accounted for in this study.

Directions for Future Research

This paper is a beginning step toward an integration of the study of disaster effects, justice in communities, and organizational justice. It is hoped that the application of organizational concepts to this non-business setting will provide a novel framework for the systematic study of disaster effects and will also help identify ways for local governments and other agencies working with disaster victims to respond effectively to the emotional as well as physical needs of victims.

It is also hoped that future studies will broaden and refine this type of research. For example, further research in this area might link these findings to the literature on public involvement and public administration and potentially offer useful information for those who provide training for individuals who respond to the public after disaster situations (N.Grigg, personal communication, October 6, 2000). Another potential extension of this study might involve linking these findings to the literature on social support or victim advocacy in an effort to explore ways to empower disaster victims in their efforts to seek assistance. In addition to these potential links with other areas of research, larger studies including victims of different types of disasters as well as individuals who are unaffected by disaster could provide useful comparisons. The inclusion of additional authority figures, as noted above, could also help broaden the scope of future studies. Future efforts could also attempt to include physiological and/or behavioral measures of stress in addition to self-report measures and refine the justice-

related scales used in the present study to more clearly delineate the constructs of interest. Future studies might also explore the effects of disasters on communities in addition to individuals and could examine variables such as dignity, morale, and social cohesion (Erikson, 19762).

In contrast with the present results, future studies might also be able to differentiate between the effects of different types of justice and identify differential effects of the various types of justice on different components of authority evaluations. Furthermore, longitudinal methods such as those used by Green and colleagues (1990; 1994) following the Buffalo Creek flood could expand the scope of the present study and address issues of retrospective self-reporting and other effects of time through the inclusion of more immediate information. Longitudinal studies could also track more effectively the course of recovery over time.

The present results suggest that the application of organizational principles to community disaster situations warrants further consideration and may provide useful information to local governments and other agencies who respond to disaster victims. These results reflect one of the primary goals of the study which was to test the applicability of organizational principles to a community setting. This approach requires additional testing and replication. However, while these results are preliminary and should be interpreted with caution, they would appear to support the idea that fair procedures, adequate information, and appropriate interpersonal treatment may enhance the relationships between victims and relevant authorities and may also enhance the recovery of victims by reducing stress.

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APPENDIX

Survey

Hello, I'm Patty Heyse. I live on the west side of Fort Collins not far from you and I am also a psychology graduate student at CSU. Our family went through the flood in 1997 and I am doing a study through the University to find out about the effects of the flood on you and about your opinions on what has happened since then. I need the assistance of people who experienced the flood to help understand some of the psychological effects of such disasters. The information you give me is for my Ph.D. dissertation and we hope to publish the results in a scientific paper. Your participation is voluntary, you can stop at any time, and your answers will be confidential. No one but my advisor and myself will see the answers, and in our report they will be combined with other people's answers so that no individual answers will be identified. The benefits of your participation include an opportunity to express your opinions about the flood and could also help communities respond effectively to people after events like the flood. The risks of participation are minimal, however, the series of questions that I would like to ask you may remind you of unpleasant memories associated with the flood. If at any time, it becomes difficult for you to talk about these questions, you may stop the interview. If you would like, or if you feel the need for additional support, I can refer you to a local counseling agency. If you have any concerns regarding this study either now or

at a later time, please contact me or my advisor, Dr. Jack Hautaluoma, at 491-6278. If you would like to participate in the survey, it will take about 20 minutes. May I begin?

1. **(Screening questions for study participation)**

A. Did you experience the flood of July 28, 1997? Y N

(If "no", thank you for your time.)

B. (If "yes") were you a property owner in this neighborhood at that time? Y N

(If "no," thank you for your time).

C. Are you 18 years old or older? Y N (If "no," thank you for your time.)

2. **The questions in the first section ask about stress. Research has shown that people who go through disasters like the flood often experience various symptoms of stress. I have a list of symptoms that have been reported by people in other disaster situations. For each symptom, please think back to the first year after the flood and rate the amount of difficulty you had at that time on a scale of 0 to 10, where 0 is "none" and 10 is "extreme." Then I would like to know whether the difficulty has become better, stayed about the same, or become worse since that time. (personal outcomes - stress symptoms)**

RS1/CS1. Let's start with physical symptoms, for example, headaches, muscle tension, pain, or unwanted weight change, increased blood pressure, or other physical problems.

- (RS1) 0 (none) 1 2 3 4 5 6 7 8 9 10(extreme)
- (CS1) Better Same Worse - if worse or better, Much or Somewhat?

RS2/CS2. Next is sadness or depressed mood

- (RS2) 0 (none) 1 2 3 4 5 6 7 8 9 10 (extreme)

- (CS2) Better Same Worse - if worse or better, Much or Somewhat?

RS3/CS3. Next, worry or anxiety?

- (RS3) 0 (none) 1 2 3 4 5 6 7 8 9 10 (extreme)
- (CS3) Better Same Worse - if worse or better, Much or Somewhat?

RS4/CS4. What about stress?

- (RS4) 0 (none) 1 2 3 4 5 6 7 8 9 10 (extreme)
- (CS4) Better Same Worse - if worse or better, Much or Somewhat?

RS5/CS5. Sleep difficulty or nightmares?

- (RS5) 0 (none) 1 2 3 4 5 6 7 8 9 10 (extreme)
- (CS5) Better Same Worse - if worse or better, Much or Somewhat?

RS6/CS6. Fatigue or loss of energy?

- (RS6) 0 (none) 1 2 3 4 5 6 7 8 9 10 (extreme)
- (CS6) Better Same Worse - if worse or better, Much or Somewhat?

RS7/CS7. Difficulty concentrating?

- (RS7) 0 (none) 1 2 3 4 5 6 7 8 9 10 (extreme)
- (CS7) Better Same Worse - if worse or better, Much or Somewhat?

RS8/CS8. Irritability?

- (RS8) 0 (none) 1 2 3 4 5 6 7 8 9 10 (extreme)
- (CS8) Better Same Worse - if worse or better, Much or Somewhat?

RS9/CS9. Apathy or loss of interest in activities you usually enjoy?

- (RS9) 0 (none)1 2 3 4 5 6 7 8 9 10 (extreme)
- (CS9) Better Same Worse - if worse or better, Much or Somewhat?

3. **Next I'd like to ask your current opinion about the City's response to your neighborhood after the flood. In this section, please state whether you Agree or Disagree with each of the following statements and use "slightly," "moderately," or "strongly" to indicate how much you either agree or disagree. (Outcomes: satisfaction and evaluation of the City)**

E1. I am satisfied with the flood relief and repair in my neighborhood. (satisfaction)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly).

E2. The people in my neighborhood were entitled to more assistance than they received from the City. (satisfaction) (R)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

E3. The City was largely responsible for the damage that occurred in my neighborhood because of the flood. (responsibility/blame)

Agree (slightly moderately strongly)Disagree (slightly moderately strongly).

E4. If the City had done things as it should before the flood, there would not have been so much damage. (responsibility/blame)(R)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

E5. Based on their efforts after the flood, I am confident that I can work effectively with the City in the future. (trust)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

E6. After my experience with the flood, I trust the City to try to do their best for our neighborhood. (trust)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

E7. No one would be angry at the City for how they responded to our neighborhood after the flood. (anger)(R)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

E8. I was angry with the way the City treated my neighborhood after the flood. (anger)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

4. In the **next section, I would like to ask how you felt about any flood relief and repair efforts in your neighborhood that were administered by the City. This may include relief and repair to people's homes and personal property or any repair to drainage or sewage systems. Again, tell me how much you agree or disagree with each statement.** (Predictors: Outcome fairness, Process fairness, Interpersonal, Accounts)

J1. Flood relief and repair efforts in my neighborhood were fair. (O)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J2. The City did all it could to help us after the flood. (O)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J3. After the flood, the City sought our neighborhood's views about the damage we had. (P, voice)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J4. The City used our neighborhood's ideas to help make their decisions after the flood. (P,voice)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J5. The City acted ethically with regard to flood relief and repair in my neighborhood. (P, ethics)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J6. After the flood, City authorities conducted themselves as public officials should in dealing with my neighborhood. (P, ethics)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J7. The City used acceptable procedures to address relief and repair issues related to the flood. (P, consistency)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J8. The City used accurate information to make decisions after the flood. (P,accuracy)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J9. The City ignored some important information about the flood. (P,accuracy) (R)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J10. We were treated with respect in our dealings with the City after the flood. (I,respect)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J11. In our interactions with the City about flood issues, we felt like valued members of the community. (I, respect)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J12. The City cared about how the neighborhood was doing after the flood. (I,sensitivity)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J13. The City treated my neighborhood in a sensitive, considerate manner after the flood.(I,sensitivity)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J14. The City expressed regret about the flooding in my neighborhood. (I, apology/remorse)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J15. The City provided reasonable explanations for their decisions after the flood. (A)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

J16. Based on their explanations, the City was justified in the way they approached flood relief and repair in my neighborhood. (A)

Agree (slightly moderately strongly) Disagree (slightly moderately strongly)

5. **In the next section, I would like to ask about the damage you received from the flood. (Predictors: impact)**

I1. How much damage did you have to your home and possessions ($ amount)?

_____ (actual damage)

I2. How much damage did you receive compared to your neighbors? (relative damage)

More (much somewhat) About the same Less (somewhat much)

I3. How much did the flood disrupt your life at that time? (disruption)

Not at all Somewhat Moderately Almost completely for awhile

6. **Now, please answer just a few questions about yourself (demographics)**

1. Which of the following categories best describes your age?

   18-24 25-34 35-44 45-54 55-64 65-74 75+

2. Gender? _____

3. What is your marital status? _____

4. How long have you lived in this neighborhood? _____

5. Which of the following categories best describes property values in your immediate neighborhood?

   Under $100K $101 – 129K $130 – 159K $160 – 189K Over $190K

Thank you for your time. Are there any questions you have for me?

Is there anything else you would like to add?

Would you like a summary report of my findings when I am done with the study? Y/N (If "yes": a summary of the findings will be posted at my homepage, heyse.org, after August 31, 2000. If you prefer, you may call my advisor, Jack Hautaluoma, at 491-6278 to leave your name and address and have the results mailed to you after August 31, 2000)

Would you be interested in a referral number for a counseling agency? (If "yes," provide agency names and telephone numbers from ServiceNet directory)