DISTRIBUTIVE AND PROCEDURAL JUSTICE:
EFFECTS OF OUTCOMES, INPUTS AND PROCEDURES

by

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(Abstract)

The purpose of the current study was to investigate whether the separate contributors to procedural and distributive justice also affected the other form of justice. Previous research investigating these cross over effects of justice contributors had not examined inputs in addition to outcomes and procedures, and had typically assumed outcome level to be equivalent to the equitableness of outcomes. Subjects were 120 undergraduate psychology students. Outcomes, inputs and procedures were manipulated in a laboratory experiment in order to assess their independent and combined effects on distributive and procedural justice perceptions. In contrast to past research, the current study found a weak and inconsistent effect of procedures on distributive justice perceptions. Outcome level had a strong effect on both procedural and distributive justice perceptions. In addition, outcome fairness was found to effect procedural justice perceptions. When procedures were fair, the equitableness of outcomes
influenced distributive justice ratings. When procedures were unfair, however, the equitableness of outcomes did not influence distributive justice judgements. Implications for procedural justice conceptualizations, equity theory and organizations are discussed.
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Introduction

Perceptions of fairness, or justice, have received extensive attention in recent years by both organizational researchers and practitioners. Anecdotal evidence (Greenberg, 1990b) illustrates the importance which managers place on appearing fair to their employees, and in addition illustrates the favorable work beliefs and behaviors a sense of fairness is assumed to engender. Researchers have demonstrated that employee perceptions of fairness are related to many organizational variables such as job satisfaction, turnover intentions, trust in management, evaluation of supervisors (Alexander & Ruderman, 1987), employee theft (Greenberg, 1990a), and organizational commitment (Folger & Konovsky, 1989).

Concerns regarding justice or fairness in organizational contexts have traditionally been approached from an outcome orientation perspective. The majority of research on organizational justice has focused on distributive justice, the perceived fairness of resource distributions (Greenberg, 1987a), and on subsequent employee reactions to perceptions of distributive justice. From this perspective, individuals are expected to evaluate organizational reward allocations and related decision making activities on the basis of the fairness of outcomes.

The most well researched distributive justice theory is equity theory (Adams, 1963, 1965), which focuses on an
individual's perceptions of outcomes received in relation to the inputs of the individual. Individuals are hypothesized to compare their ratio of inputs and outcomes to the ratio of a relevant referent, such as a co-worker or their own past experience. Perceptions of distributive fairness or equity are predicted when the comparison ratios are equivalent. The outcomes of organizational pay distributions have received particular attention, most likely because monetary rewards are easily studied within the equity theory framework (Walster, Walster, & Berscheid, 1978).

Equity theory alone, however, does not provide a comprehensive view of the role of justice in organizations. Equity theory espouses a unidimensional approach which conceptualizes perceived justice only in terms of merit or contribution (Leventhal, 1980). Merit, however, is only one of several potentially relevant standards of distributive justice. Distributive standards that have attracted less empirical interest than equity theory are equality and need. The distributive standard of equality proposes that equal outcomes will be perceived as distributively fair, while the standard of need proposes that outcomes distributed in proportion to individuals' needs will be perceived as distributively fair (Deutsch, 1975). In a recent study, however, Wagstaff, Huggins and Perfect (1993) reported that
equitable distributions were found to more fair than equality or need based distributions in a business situation. In addition, equity was judged to be least likely to invoke conflict.

A second problem with equity theory in particular, and distributive justice in general, is the sole emphasis on the final distribution of outcomes (Leventhal, 1980). It has become clear recently that perceptions of justice or fairness are not limited to the domain of outcomes or rewards. Individuals are sensitive to procedural fairness issues in decision making situations which are independent of the outcomes they receive. The concept of procedural justice (Leventhal, 1976, 1980; Thibaut & Walker, 1975) was introduced in order to address this phenomena. Procedural justice is defined as the perceived fairness of procedures used in decision making. Procedural justice is now being studied extensively, and complements rather than replaces the outcome orientation of distributive justice.

Thibaut and Walker were among the first to investigate procedural justice. Their goal was to apply social psychological theory to the area of legal dispute resolution, hence their 1975 monograph addressed both psychologists and lawyers. Thibaut and Walker (1975) proposed two criteria by which individuals might judge the fairness of legal procedures: control over decision making
processes and control over actual decisions. Leventhal (1976, 1980) and Deutsch (1975) examined procedural justice outside of its original judicial context and paired it conceptually with distributive justice, thus creating a more unified approach to the study of justice perceptions. Leventhal (1980), focusing on resource distributions, proposed that fair distributions are characterized by procedural rules which are consistent across persons and over time, free from bias by the decision maker, based on accurate information, correctable, representative of all recipients' concerns, and based on prevailing moral and ethical standards.

One characteristic which both procedural justice perspectives have in common is the inclusion of influence over decisions as a contributor to procedural justice perceptions. Thibaut and Walker's (1975) process and decision control, and several factors of Leventhal's (1976, 1980) such as correctability and representativeness of all recipients concerns, imply varying degrees of influence over decisions.

The two theoretical perspectives appear to be somewhat divergent, however, possibly because Thibaut and Walker (1975) focused on legal dispute resolutions while Leventhal (1976, 1980) focused on resource distributions. A significant area of difference between these two theoretical
perspectives is their contrasting emphasis on the formal or structural characteristics of procedures. Thibaut and Walker investigated procedural justice perceptions by varying only the structural characteristics of procedures and holding the decision maker style, or behaviors of the individual decision maker, constant. As Lind and Tyler (1988) described, Thibaut and Walker limited their procedural manipulations to, "an idealized perfect enactment of the procedure" (p. 18).

In contrast to Thibaut and Walker's perspective, Leventhal did not specifically distinguish between the structural characteristics of procedures and other less formal characteristics related to the enactment of procedures by decision makers. Of the six procedural rules he proposed, at least one appears to be a non-structural characteristic of procedures (bias suppression), while the remainder could be interpreted and operationalized as either structural or non-structural characteristics.

Recently, there has been increasing recognition for non-structural procedural characteristics and their contributions to procedural justice perceptions (Tyler & Bies, 1990). For example, Bies and Shapiro (1987) found that procedural justice was rated higher when a decision maker provided a causal account or justification for an unfavorable outcome. Tyler and Bies suggested that
procedural fairness judgements are influenced by formal procedures, the enactment of formal procedures, and the interpersonal treatment by the decision maker.

A number of researchers have argued that the concept of procedural justice should be limited to structural procedures (e.g., Bies & Moag, 1986; Leung, Chiu, & Au, 1993). According to this view, much of past procedural justice research has confounded procedural justice with justice concerns related to the enactment of procedures and interpersonal treatment. For the purpose of this review, however, the effects of structural and non-structural procedural characteristics on procedural justice perceptions will not be differentiated.

Many diverse researchers have examined the potential relevance of an organizational justice framework. For example, grievance systems and settlements (Gordon & Bowlby, 1988; Fryxell & Gordon, 1989), parental leave policies (Grover, 1991), alternative dispute resolution procedures (Vider, 1992), punishment in organizations (Ball, Trevino, & Sims, 1993; Trevino, 1992), equal opportunity perceptions (Witt, 1991), employee reactions to drug testing programs (Crant & Bateman, 1989; Konovsky & Cropanzano, 1991; Raciot & Williams, 1993), organizational citizenship behaviors (Organ & Moorman, 1993) and employee theft (Greenberg, 1990a) have all been examined from an organizational justice
perspective. Crant and Bateman (1989) note that although much of distributive justice research concerns allocation decisions, equity judgements can occur in situations where one party takes action in relation to another, and the latter attaches a positive or negative value to the action. In addition, other research areas drawing on social psychology such as acceptance of political status quo (Tyler & McGraw, 1986) consumer reactions (Hunt & Kernan, 1991) and the acceptance of unpopular public policies (Gibson, 1989) have also found justice to be a useful framework.

The importance of both procedural and distributive justice becomes apparent when the implications of the perceptions of justice and injustice are examined. For example, Barrett-Howard and Tyler (1986) found that the criteria of procedural and distributive justice were equally important when subjects made decisions about resource allocations. Procedures used by leaders to allocate outcomes had an impact on subsequent evaluations of their leadership ability, independent of actual allocation levels or the fairness of outcomes (Tyler & Caine, 1981). Greenberg (1986) found that distributive and procedural concerns both contributed to perceptions of fairness in performance evaluations.

Several studies have discovered that perceptions of procedural and distributive justice may not contribute
equally to organizational outcome measures. The most common findings suggest that distributive justice may be more closely related to satisfaction with specific personal outcomes, while procedural justice is more predictive of global evaluations (Lind & Tyler, 1988). For example, Alexander and Ruderman (1987) surveyed approximately 2800 federal government employees and found that procedural justice accounted for more variance than did distributive justice in job satisfaction, evaluation of supervisor, conflict/harmony, and trust in management. Folger and Konovsky (1989) reported that distributive justice accounted for more variance than did procedural justice in pay satisfaction. However, procedural justice accounted for more variance than did distributive justice in organizational commitment. These examples illustrate not only the importance of justice perceptions, but the differential impact of procedural and distributive justice concerns on other relevant organizational variables.

The existence and importance of both distributive and procedural justice perceptions have been demonstrated, however the relationship between these justice perceptions is not well understood. An unresolved issue is whether the fairness of procedures used in decision making influences the fairness of the resulting outcomes. Leventhal (1976) speculated that individuals probably believe that procedural
fairness is a necessary precondition for the establishment of distributive fairness, because distributive fairness is likely to be violated unless procedural justice exists. Consequently, unless proper procedures are used, the fairness of outcomes will be doubted.

Thibaut and Walker (1975) also suggested that fairer procedures will lead to perceptions of fairer outcomes, because perceptual overlap between distributive and procedural justice is likely. Morgan and Sawyer (1979) proposed that in most social situations individuals have difficulty evaluating the value of social exchanges and social status characteristics. Consequently, individuals may use procedural rather than distributive cues to determine whether justice has occurred. According to this view, if a fair procedure is followed, it is expected that the outcome will be viewed as fair also.

An additional unresolved issue is whether outcomes received as a result of a decision process will influence the fairness ratings of the procedures used in the decision process. If outcomes do affect procedural justice perceptions this may be caused by egocentric bias, which is used to explain why higher outcomes are generally seen as more equitable than lower outcomes (Greenberg, 1983a). Egocentric bias resulting from outcomes may generalize to perceptions of procedures. This may explain any findings of
a relationship between outcomes and procedural justice perceptions (Greenberg, 1987a).

Alternatively, Lind and Tyler (1988) have suggested that outcome levels may provide "information" about the fairness of procedures. In other words, outcomes may be used to infer whether procedures are fair. Lind, Kurtz, Musante, Walker and Thibaut (1980) suggested that poor or low outcomes may invoke an attributional process resulting in the perception that an apparently fair procedure had been somehow corrupted. Lind and Lissak (1985) suggested that when an otherwise fair procedure appears to be enacted with impropriety, a fuller attributional process which examines the outcomes may occur.

A number of researchers have examined whether the contributors to each form of justice may "cross over" to the other form. When examining the effects of procedures, researchers have generally reported that procedures had a positive impact on distributive justice perceptions (e.g., Gilliland, 1993; Lind et al., 1980). Results of studies examining the effects of outcomes on procedural justice perceptions have been fairly equally divided, however. While a number of studies have found that outcome levels positively influence procedural justice perceptions (e.g., Lind & Lissak, 1985; Walker, LaTour, Lind & Thibaut, 1974) others have found that outcomes had no effect on procedural
justice perceptions (e.g., Landy, Barnes-Farrell, & Cleveland, 1980; Lind et al., 1980).

Unfortunately, a conceptual weakness limits the theoretical contributions of studies in this domain. Researchers have attempted to determine if contributors to perceptions of distributive justice also influence perceptions of procedural justice, and if contributors to perceptions of procedural justice also influence perceptions of distributive justice. Procedural justice perceptions are determined by psychological reactions to procedures used in decision making. Equity based distributive justice perceptions, however, are not determined solely on the basis of the outcomes resulting from a decision making process. Equity perceptions are determined by the assessment of outcomes in relation to the inputs of the individual. In addition, the individual’s outcome and input relationship is compared to the outcomes and inputs of relevant others.

Consequently, studies in this domain that have examined only whether outcomes may influence procedural justice perceptions are neglecting both the inputs and the actual fairness of the outcomes (input/outcome relationship) as possible contributors to procedural justice perceptions. In addition, Lind and Tyler (1988) suggested that researchers addressing these relationships typically confound outcomes and distributive fairness, by examining only low, unfair
outcomes and high, fair outcomes. If outcomes and perceptions of distributive fairness are confounded, it is not possible to determine whether any significant results for the effect of outcome on procedural justice perceptions are due to the actual outcome level, the input level, or the perceived fairness of the outcome.

The purpose of this study is to build upon past research examining the procedural and distributive justice relationship. The effects of outcomes, inputs and procedures will be examined in order to assess their independent and combined effects on distributive and procedural justice perceptions. Because this is the first study to examine inputs in addition to outcomes and procedures, an experimental design will be employed in order to ensure a high degree of internal validity, and eliminate confounding variables problematic in past research.

In addition to examining contributors to justice perceptions, this study will also examine the consequences of justice perceptions. Past research has found that distributive justice may be more closely related to satisfaction with specific personal outcomes, while procedural justice is more predictive of global evaluations (Lind & Tyler, 1988). The differential impact of procedural and distributive justice on outcome variables such as pay
satisfaction and evaluation of experimenter will be assessed with the hope of replicating past research results.
Literature Review

Although the majority of justice research has focused on the perceptions and reactions of persons affected by decisions, one domain of the justice field has addressed the actual procedural and distributive fairness of decision makers (Karambayya & Brett, 1989), the efforts of decision makers to be fair (Sheppard, Saunders & Minton, 1988; Tyler & Griffin, 1991) or the efforts of decision makers to appear fair (Greenberg, 1990b). The purpose of this study, however, is to examine justice perceptions of individuals affected by outcome decisions. Consequently, this review will focus on the perceptions and behaviors of persons affected by decisions, not the behaviors, intentions or motives of decision makers.

Distributive and procedural justice will be examined from both a theoretical and empirical perspective. First, the relationship between procedural justice, distributive justice and outcome variables will be presented demonstrating the consequences and importance of justice perceptions. This review will then focus on the causes or contributors to equity and procedural justice perceptions, and the relationship between equity and procedural justice perceptions. Although equity is just one of several distributive justice standards (e.g., need and equality), this review will focus on equity theory. Equity is the
distributive construct of interest in the current study, and previous research suggests it the most relevant distributive justice construct in organizational settings (Wagstaff et al., 1993).

The Importance of Justice Perceptions: Justice and Outcome Relationships

Greenberg (1990c) has suggested that organizational justice research may have the potential to explain many organizational outcome variables. For example, if employees believe they are fairly treated they are more likely to hold positive attitudes regarding their work, work outcomes and supervisors (Moorman, 1991). As Grover stated, "A major reason for studying justice in organizations is to determine the consequences of perceived fairness" (1991, p. 248).

Numerous studies have examined the effect of distributive and procedural justice on various outcome measures. Remondet and Hansson (1991) found that decreased control in the work place, a contributor to procedural injustice perceptions, was related to greater job stress, depression, work related injuries, absenteeism, lower job satisfaction and lower job involvement. Similarly, Mark (1985) found that unfair procedures led to more anger, lower achievement striving, and greater devaluation of the outcome compared with fair procedures in an experimental setting.
Subjects given the opportunity to express their dissatisfaction, a contributor to procedural justice perceptions, were significantly more satisfied with a payment outcome than subjects not given the opportunity to express their opinion (Folger, 1977). Youngblood, Trevino and Favia (1992) found that among dismissed employees who filed unjust dismissal claims, procedural injustice perceptions were more often cited compared with distributive injustice perceptions. In a recent study investigating the compliance of subsidiary top managers with corporate decisions, Kim and Mauborgne (1993) found that procedural justice increased managerial decision compliance.

Barrett-Howard and Tyler (1986) used a vignette paradigm in which subjects rated the importance of Leventhal’s six rules of procedural justice, distributive justice, and six nonfairness characteristics (e.g., feasibility of procedure and speed of decision process) when making allocation decisions. Their results indicated that procedural and distributive justice were equally important criteria in allocation decisions, and were more important than nonfairness criteria.

Using survey data, Tyler and Folger (1980) discovered that during contact with police officers, citizens’ perceptions of overall fairness depended more on the procedures used by the police officers than the outcome of
the police contact. Tyler and Caine (1981) reported conflicting evidence regarding the effect of outcomes and procedures on leadership evaluations. Their results revealed that both outcomes and procedures influenced leadership evaluations when subjects were responding to hypothetical situations. However, when responding to their previous experiences, outcome levels did not influence leadership evaluations. This suggests that while subjects can take both outcome and procedure information into account when evaluating leaders, subjects tend to focus more on procedures in natural settings.

Konovsky and Folger (1991) found that among employees who were laid off, procedural justice characteristics of the layoff process were predictive of employees’ willingness to recruit for their former employer. Layoff benefits, or outcomes in this situation, were not predictive of subject attitudes. Similarly, data reported by Smither, Reilly, Millsap, Pearlman and Stoffey (1993) suggest that job applicants’ willingness to recommend an employer to others was more strongly related to their perceptions of procedural justice than distributive justice.

Alexander and Ruderman (1987) factor analyzed survey data from government employees and determined that procedural and distributive justice had different relationships with five outcome variables. Procedural
justice accounted for more variance in job satisfaction, evaluation of supervisor, conflict/harmony, and trust in management. Distributive justice accounted for more variance in turnover intention.

Using employee questionnaire data, Konovsky, Folger, and Cropanzano (1987) found that procedural justice accounted for more variance in organizational commitment, whereas distributive justice accounted for more variance in satisfaction with pay. In a survey of employees investigating reactions to pay raise decisions, Folger and Konovsky (1989) found that distributive justice accounted for more variance in pay satisfaction than did procedural justice. Procedural justice accounted for more unique variance in organizational commitment and trust in supervisor.

In an organizational setting, Dailey and Kirk (1992) found that procedural justice perceptions were correlated with quitting intentions, however, distributive justice perceptions were not. Job satisfaction was more strongly related to distributive justice. In the context of drug testing, procedural justice was found to be more predictive than outcome fairness of affective commitment, trust in management and employee performance. However, neither procedural nor distributive justice were found to be related
to continuance commitment and job satisfaction (Konovsky & Cropanzano, 1991).

McFarlin and Sweeney (1992) found distributive justice was a stronger predictor of pay satisfaction and job satisfaction than was procedural justice. Conversely, organizational commitment and supervisor evaluations were more highly related to procedural justice. The results of this study also revealed an interaction of procedural and distributive justice. High procedural justice perceptions were associated with high commitment and high supervisor evaluations independent of the level of distributive justice reported. However, the combination of low procedural and distributive justice perceptions produced the lowest ratings of commitment and supervisor evaluations.

Sweeney and McFarlin (1993) tested four models of the relationship between procedural justice, distributive justice, and various outcome variables. The first model, the two-factor model, suggests that procedural justice may be more strongly related to global evaluations of organizations, while distributive justice is more strongly related to personal level evaluations. The second model, the procedural primacy model, suggests that while distributive justice affects both global and personal level evaluations of organizations, procedural justice perceptions directly affect perceptions of distributive justice. The
third model, the additive model, suggests that procedural and distributive justice to not interact to affect employee reactions, but produce independent and additive effects. The fourth model, called the distributive halo model, predicts that distributive justice has a direct effect on many different employee reactions, including a direct effect on procedural justice perceptions.

Sweeney and McFarlin’s (1993) results support the two-factor model of justice. Distributive justice was more predictive of personal level evaluations, such as pay satisfaction. Procedural justice was more predictive of global, organizational level evaluations, such as commitment.

It is possible that situational or individual factors moderate the importance of procedural and distributive justice. Gordon and Fryxell (1989) investigated one potential moderator, voluntariness of association. They found that procedural justice concerns were very predictive of satisfaction when workers were required to be in unions. However, when workers had freely chosen their union status, procedural justice was less predictive of satisfaction. Gordon and Fryxell propose that perceptions of personal control may be the underlying explanation for these results.

Witt and Broach (1993) found that procedural justice perceptions were positively related to satisfaction with a
training experience, however, an individual difference variable moderated this relationship. The relationship between procedural justice perceptions and satisfaction was stronger among individuals high in exchange ideology. Exchange ideology is defined as an effort-outcome expectancy; individuals high in exchange ideology are expected to moderate their work effort to be congruent with their perceived treatment by the organization.

In conclusion, empirical evidence demonstrating the consequences and importance of justice perceptions has been presented. Studies examining the relative predictive ability of procedural and distributive justice seem to suggest that the results depend on the nature of the outcomes being examined. Procedural and distributive justice perceptions may influence other organizational outcome variables differently; distributive justice may be better able to predict satisfaction with specific personal outcomes, while procedural justice may be more predictive of global evaluations (e.g., Folger & Konovsky, 1989; Lind & Tyler, 1988).

Equity Theory

Adam's (1963; 1965) equity theory suggests that people will compare the ratio of their perceived outcomes and inputs to the corresponding ratio of a comparison other or referent. Inequity perceptions are expected to exist when
the individual's ratio of inputs and outcomes is not equal to the referent's ratio of inputs and outcomes. If inequity is perceived, the individual may view himself or herself to be over rewarded (positive inequity) or under rewarded (negative inequity) in relation to the referent other. Perceptions of inequity will produce tension in the individual, resulting in the motivation to reduce this tension by restoring equity. The strength of the tension reduction motivation is directly proportional to the amount of inequity perceived.

In order to restore equity, individuals may increase or decrease their inputs, increase or decrease their outcomes, or leave the situation. In addition to these potentially observable behaviors, individuals may also change their referent, psychologically distort their inputs or outcomes, or psychologically distort their referent's inputs or outcomes (Adams, 1963; Walster, Walster & Berscheid, 1978).

It is important to note that equity theory is based on the concept of relative justice. In this conceptualization, an individual's evaluation of the absolute value of both outcomes and inputs is not the critical consideration responsible for fairness judgements. More important is the comparison of one's input and outcome ratio with the ratio of a relevant referent, such as another individual or one's own past experience. In addition, individuals may use
organizational system referents which are explicit or implicit agreements concerning expected inputs and outcomes (Goodman, 1977).

Inputs in the equity comparison are the perceived contributions of the individual, not the actual inputs used to determine outcomes (e.g., Adams, 1963; Mowday, 1983). For example, in a pay raise situation, an individual may perceive experience, training and seniority as inputs in the equity equation. According to equity theory, it is not relevant whether this information was actually used to determine pay raises. Similarly, outcomes in equity theory are also perceptually based. As Adams stated, "If the recipient considers it to be relevant to the exchange and it has some marginal utility for him, it is an outcome" (1963, p. 423).

The first proposition of equity theory states that individuals are motivated to maximize their outcomes (Walster, Berscheid & Walster, 1973). Building on this assumption, groups will act in their own self-interest to maximize collective rewards by developing rules, such as equity, for allocating resources. In order to ensure group members accept the equity rule, groups will reward members who treat others equitably and punish members who treat others inequitably (Walster et al., 1973; Walster et al., 1978).
**Equity theory empirical evidence.** Perry (1993) investigated the psychological inequity distress predicted by equity theory. Perry found that relatively overpaid and underpaid workers expressed more psychological distress than equitably paid workers. However, the results revealed a positive linear relationship between amount of pay and job satisfaction, suggesting that while overpaid workers experienced more psychological distress, they did not experience a corresponding reduction in job satisfaction.

Martin and Peterson (1987) applied equity theory to a two-tier pay wage situation, in which the top pay rate for new employees was lower than the top pay rate for previously hired employees. The results revealed that the majority of employee perceptions were consistent with equity theory predictions. In particular, low-tier employees perceived significantly less pay equity than their high-tier counterparts. Cowherd and Levine (1992) examined the effects of equitable pay between lower-level employees and top management. Consistent with equity theory predictions, small pay differentials between employees and management was positively related to employee product quality.

Chiu (1990) investigated students' perceptions of distributive justice in a classroom setting. Students preferred an equitable distribution of grades, based on contribution to the group project, when they did not expect
to continue the work relationship with their group members. However, when group members believed that low contributors had nonetheless made a large effort to contribute, an equal distribution of grades was considered fair. In addition, group cohesiveness was positively related to the perceived fairness of an equality based distribution of grades.

Van Dijk and Grodzka (1992) found support for equity theory using an experimental design in which subjects were required to contribute resources in order to increase rewards for all group members. Subjects who were aware of differential resource levels within the group considered it fair for high resource members to contribute more than low resource members. In a related study using a similar research paradigm, subjects who were given no explanation for why group rewards would be divided unequally, gave resources in proportion to their expected rewards (Van Dijk, & Wilke, 1993). When the subjects were told that group resources would be divided unequally because more time was required from some subjects, subjects gave equally to the group regardless of how they expected to benefit compared with other group members.

Bazerman, Loewenstein and Blount White (1992) found that individuals displayed a great concern for relative payoffs when they evaluated the desirability of a payoff for themselves and another person. However, when asked to
choose between two or more pairs of outcomes, their choices reflected greater concern for the absolute level of their payoffs, and less concern for relative payoffs. In a related study, however, equity theory could explain the preferences of individuals in a Maximizing Difference Game in which players must choose between outcome pairs for themselves and a partner (Wilke, Liebrand, Lotgerink & Buurma, 1986).

Hammock, Rosen, Richardson, and Berstein (1989) examined the equity restoration reactions of subjects in a mock learning experiment. The results indicated that both over and under benefitted subjects acted to restore equity with their partners by varying the number and level of punitive shocks. Consistent with equity theory predictions, Brockner, O’Malley, Hite and Davies (1987) demonstrated that participants in an experiment made greater self-allocations to themselves rather than their partner when they performed better than their partner. Participants low in self-esteem, however, were more likely to imitate their partner’s allocation pattern.

Griffeth, Vecchio, and Logan (1989) investigated the joint influence of equity and interpersonal attraction on perceived equity and task performance. The results showed that participants acted to restore equity by altering the quantity and quality of their work. In addition, the
attractiveness of the referent influenced equity responses, suggesting that the characteristics of referents can influence equity judgements.

Greenberg (1989) investigated whether the psychological distortion predicted by equity theory took place in a pay cut situation. As expected, the results suggested that workers cognitively reevaluated their outcomes during the pay cut; the perceived importance of non-monetary outcomes was higher during the pay cut than after full pay was reinstated. In a similar pay reduction situation, underpayment resulted in increased employee theft (Greenberg, 1990a). In a study examining work outcomes other than pay, Greenberg (1988) found that temporary office assignments resulted in efforts to establish equity through work performance. In this field study, employees assigned to higher status offices increased their performance level compared with control employees, while employees assigned to lower status offices decreased their performance level.

Several authors have investigated the performance of major league baseball players from an equity theory perspective. Taking advantage of contract changes regarding free agent players, Lord and Hohenfeld (1979) found that equity theory successfully predicted performance decrements for three out of four performance measures. In a later examination of an extended major league sample, however,
these results were not replicated (Duchon & Jago, 1981). In a related study, Hauenstein & Lord (1989) examined the performance of major league baseball players who had participated in final-offer arbitration processes. Final-offer arbitration involves an impartial arbitrator adopting either the player's or the team management's nonnegotiable salary figure. Their results were consistent with equity theory predictions, which suggest that when salary levels are perceived as low and inequitable, performance will decrease. Several other similar studies have also found equity theory to be a useful framework for understanding the performance of major league baseball players (Bretz & Thomas, 1992; Harder, 1991; Howard & Miller, 1993).

A number of researchers have examined the usefulness of equity theory in understanding interpersonal relationships. Researchers have found that equitable interpersonal relationships result in the more satisfaction with the relationship (Bunk & VanYperen, 1991; Snell & Belk, 1985), and more contentment and commitment (Winn, Crawford, & Fischer, 1991). Canary and Stafford (1992) found that spouses reduced their marital maintenance behaviors, or inputs, when they perceived negative inequity in their spousal relationship.

Empirical evidence detailing the existence of distributive justice perceptions and the usefulness of
equity theory in explaining behavior has been presented. Consistent support for equity theory has been demonstrated in both laboratory (e.g., Van Dijk & Wilke, 1993) and field studies (e.g., Cowherd & Levine, 1992) examining equity perceptions and attempts to restore equity. In addition, these studies have found equity theory to be a useful framework in settings investigating such diverse areas as classroom grades (Chiu, 1990), major league baseball performance (e.g., Hauenstein & Lord, 1989), and interpersonal relationships (e.g., Canary & Stafford). Equity theory is further supported by the demonstration of psychological inequity distress which is hypothesized to motivate to equity restoration (Perry, 1993). In addition, cross cultural evidence suggests that equity theory is a useful tool even in collectivistic societies such as Japan (Kashima, Siegal, Tanaka & Isaka, 1988). In summary, equity theory has enjoyed a long history of successful research which suggests that equity is a powerful standard in many work and interpersonal situations.

Procedural Justice

In the 1970’s, social psychologists who had been studying distributive justice began to direct their attention to procedural justice. Procedural justice refers to the perceived fairness of procedures used in decision making. In contrast to the content orientation of equity
theory, procedural justice focuses instead on the process of decision making (Greenberg, 1987b). Two separate conceptual perspectives of procedural justice were developed by Thibaut and Walker (1975), and Leventhal (1976, 1980). Thibaut and Walker (1975) examined the type of control allowed to disputants and an intervening third party in dispute resolution procedures. Control of both the disputants and the third party can be characterized as "process control" and "decision control." Process control refers to control over the development and selection of information subsequently used to resolve a dispute. Decision control refers to the degree to which a participant controls the outcome of the dispute.

Thibaut and Walker (1975) outlined five dispute resolution procedures that vary the degree and type of control afforded the intervening third party and the disputants. These procedures are:

1. autocratic procedures - third party has control over processes and decisions;
2. arbitration procedures - third party has control over decisions, but not processes;
3. mediation procedures - third party has control over processes, but not decisions;
4. moot procedures - third party shares control over processes and decisions with disputants; and
5. bargaining procedures - third party has no control over processes or decisions.

The second approach to procedural justice, advanced by Leventhal (1976, 1980), emphasized reward allocation. Leventhal proposed that individuals will examine a number of procedural elements in order to evaluate the fairness of procedures. These procedural elements are:

1. selection of agents - procedures for determining who makes allocation decisions;
2. setting ground rules - procedures for determining and evaluating potential rewards, and the behaviors necessary to attain them;
3. gathering information - procedures for obtaining and using information about reward recipients;
4. decision structure - procedures for defining the structure of the allocation decision process (e.g., the successive ordering of individual and group decisions);
5. appeals - procedures for seeking redress against unsatisfactory decisions;
6. safeguards - procedures for ensuring that the decision-making body does not abuse its power; and
7. change mechanisms - procedures enabling allocation practices to be altered.
An individual may evaluate any of these procedural elements using six procedural rules. Leventhal assumed that the weighting of the procedural rules may vary according to the situation. However, the principles for weighting were not specified. The procedural rules are:

1. **consistency rule** - allocation procedures should be consistent across persons and over time;
2. **bias suppression rule** - personal self-interest in the allocation process should be prevented;
3. **accuracy rule** - decisions must be based on accurate information;
4. **correctability rule** - opportunities must exist to enable decisions to be modified;
5. **representativeness rule** - the allocation process must represent the concerns of all recipients; and
6. **ethicality rule** - allocations must be based on prevailing moral and ethical standards.

Lind and Tyler (1988) presented two explanatory models of motivation which addressed the assumptions underlying procedural justice. Similar to the assumptions of equity theory, the self-interest model states that individuals seek control over decisions because they are concerned with maximizing their outcomes. Thibaut and Walker's view of procedural justice is based on this motivation of persons (Lind & Tyler, 1988). The group value model suggests that
individuals value group membership for non-outcome reasons. Procedures are subsequently evaluated in terms of whether they affirm one's status in the group. Tyler (1989) found support for the group value model, and suggested that control issues are important to the dispute settings studied by Thibaut and Walker, but are less important in other settings. Other research, however, has found support stronger support for the self-interest model (Conlon, 1993). It may be premature to form any conclusions regarding the differential value of these two models.

More recently, researchers have begun to note that in addition to the actual procedures used, the way procedures are enacted by the decision maker may be important to fairness perceptions (e.g., Bies & Shapiro, 1987; Tyler & Bies, 1990). Although Greenberg (1990c) suggested that procedural justice refers to both the structural characteristics of the decision and the quality of the interpersonal treatment associated with decision making, other researchers have suggested that the construct of procedural justice should be limited to structural procedures (e.g., Bies & Moag, 1986). For the purpose of this review, however, the effects of structural and interpersonal characteristics on procedural justice perceptions will not be specifically differentiated.
Procedural justice empirical evidence. A number of studies have investigated the existence of and contributors to procedural justice perceptions. For example, Sheppard & Lewicki (1987) identified 16 rules which employees used to evaluate managerial fairness. The rules included all of Leventhal’s procedural justice rules and one distributive fairness rule. They also discovered nine previously unidentified rules which may have been specific to the managerial fairness situation.

In a review of the procedural justice literature, Folger and Bies (1989) reported seven key managerial responsibilities which employees perceived as central to procedural justice. The first was giving adequate consideration to employees’ viewpoints, which is closely related to Thibaut and Walker’s process control. The second is suppressing biases which is directly related to Leventhal’s bias suppression rule. The third is applying decision-making criteria consistently across employees, which is directly related to Leventhal’s consistency rule. The fourth is being truthful in communication, which is relevant to Leventhal’s ethicality rule. The last three are providing timely feedback to employees after the decision, providing justification for the decision, and treating employees with courtesy and civility.
Greenberg (1986) surveyed middle managers in order to investigate the determinants of performance evaluation fairness. Two factors were revealed, a distributive factor and a procedural factor. The distributive determinants included receipt of ratings based on performance, and salary and promotions based on performance ratings. The procedural determinants included soliciting input prior to evaluation and using it, two-way communication during the interview, ability to challenge/rebut the evaluation, rater familiarity with the ratee’s work, and consistent application of standards. Several of the procedural determinants closely correspond to Leventhal’s procedural rules, and Thibaut and Walker’s process control. Similarly, Singer (1990) conducted an exploratory analysis of perceived fairness in selection practices. Singer found five factors of perceived fairness which closely matched Leventhal’s procedural rules. In addition, these factors were consistent across two samples: entry level job applicants and human resource professionals.

Tyler (1988) investigated whether procedural justice affected citizen reactions to contacts with the police and court systems, and how citizens defined fairness. Seven variables influenced perceptions of procedural fairness regarding legal authorities. These variables were: degree to which authorities were motivated to be fair, judgements
of their honesty, degree to which authorities followed ethical principles of conduct, extent to which opportunities for representation were provided, quality of decisions made, opportunities for error correction, and whether authorities behaved in a biased fashion. Tyler's results suggested that citizens judge the fairness of procedures according to different criteria in different situations. No evidence indicated that individual differences, such as gender, age, race, education, income or degree of liberalism, produced differences in the use of criteria. In addition, the results showed that procedural justice had a major influence on citizen satisfaction.

Lind, Lissak, and Conlon (1983) reported that greater process control enhanced perceptions of procedural justice in non-binding dispute resolution procedures. Similar research has shown that courtroom situations which give process control to disputants invoke more satisfaction with the procedures, and the procedures are seen as being fairer, than situations in which no process control is allowed (Walker et al., 1974; Lind et al., 1980). In these situations, disputants prefer adversarial procedures, which gives the dispuant more control over evidence presented, to inquisitorial procedures. Recent research, however, suggests that hybrid procedures which combine aspects of both the adversary and inquisitorial models may be perceived
as more procedurally fair than adversarial procedures alone (Poythress, Schumacher, Wiener, & Murrin, 1993).

The general preference for adversarial procedures over inquisitorial procedures can not be explained by a cultural bias due to Americans' familiarity with adversarial procedures. Cross-cultural evidence from countries using the inquisitorial courtroom system has also suggested that adversarial procedures are preferred (Lind, Erickson, Friedland, & Dickensberger, 1978). In fact, Lind and Early (1992) suggest that procedural justice concerns may be more important in cultures that are less individualistic and where social concerns are stronger.

A number of studies have found that the opportunity for voice, or opinion expression, has increased procedural justice judgements (e.g., Bies, 1987). In addition, justifications by the decision maker and perceptions of decision maker sincerity have also influenced procedural justice perceptions. Lind, Kanfer and Earley (1990) found that perceptions of control accounted for some but not all of the variance in voice enhancements of procedural justice perceptions. They concluded that both instrumental and non-instrumental concerns are responsible for voice effects.

Tyler, Rasinski and Spodick (1985) explored the distinction between process and decision control in the area of leadership endorsement. The results revealed that the
opportunity to express opinions led to increased judgments of procedural justice, independent of decision control. These findings suggest that the opportunity to express opinions may have value in itself. It should be noted, however, that when individuals believe their views are not being considered, the justice-enhancing effects of voice can be negated (Tyler, 1987).

In summary, a review of the procedural justice empirical literature suggests that individuals are sensitive to the procedures used in decision making situations and make judgements regarding the fairness of procedures. Exploratory research designs have been particularly helpful in establishing the existence of procedural justice perceptions in organizational situations such as performance evaluation (Greenberg, 1986) and selection practices (Singer, 1990). Although the procedural justice conceptualizations proposed by Thibaut and Walker (1975), and Leventhal (1980) are quite distinct, both conceptualizations have received strong empirical support. Proposed Relationships between Distributive and Procedural Justice Perceptions

The importance of both distributive and procedural justice perceptions has been demonstrated in many organizational and dispute resolution settings. However, the relationship between both forms of justice warrants a
closer examination. Of interest is whether contributors to each form of justice also influence the other form of justice. Specifically, do procedures influence only procedural justice, or do they also influence distributive justice perceptions? Conversely, do contributors to distributive justice perceptions also effect procedural justice perceptions?

Several justice theorists and researchers have addressed the relationship between distributive and procedural justice. Thibaut and Walker (1975) proposed that the relationship between both forms of justice could be independent. Specifically, they suggested that distributive justice could be achieved in the absence of fair procedures. Although Thibaut and Walker (1975) proposed the conceptual independence of distributive and procedural justice, they also suggested that fairer procedures may lead to fairer outcomes, because of possible perceptual overlap between distributive and procedural justice. Similarly, Leventhal (1976) argued that procedural justice may be necessary to establish distributive justice. Individuals may believe that unless procedural fairness exists, distributive fairness may be violated. Consequently, an individual’s perception of procedural fairness may affect his or her perception of distributive fairness.
Morgan and Sawyer (1979) suggested that individuals may have difficulty evaluating the value of social exchanges and social status characteristics in most social situations. Consequently, individuals may use procedural rather than distributive cues to determine whether justice has occurred. According to this view, if a fair procedure is followed, it is expected that the outcome will also be viewed as fair.

It is also possible that outcomes received will influence the procedural fairness perceptions of decisions. One potential explanation for this relationship may be egocentric bias. Egocentric bias is used to explain why higher outcomes are generally seen as more equitable than lower outcomes (Greenberg, 1983b). Egocentric bias caused by outcomes may generalize to perceptions of procedures, and may explain any outcome and procedural justice perception relation (Greenberg, 1987a). Specifically, procedures which result in higher outcomes, or benefit the individual more, may be viewed as more procedurally fair compared with procedures which result in lower outcomes. Egocentric bias, however, is not the only way outcomes may influence procedural justice perceptions. Lind and Tyler (1988) have suggested that outcomes may provide "information" about the fairness of procedures. For example, the outcome resulting from a procedure may be used to infer whether the decision maker is giving due consideration to relevant issues.
In addition to the direct effect of outcomes discussed above, the equity of outcomes may influence procedural justice perceptions. Specifically, the combination of inputs and outcomes in relation to a referent may have an independent impact on procedural justice perceptions (Lind & Tyler, 1988).

**Empirical evidence relating distributive and procedural justice.** Many studies have provided evidence of the cross over effects between both forms of justice. Walker, Lind, and Thibaut (1979) found that perceptions of distributive justice did not affect perceptions of procedural justice, however, perceptions of procedural justice enhanced perceptions of distributive justice. The tendency for procedural justice perceptions to enhance distributive justice perceptions has been called the fair process effect (Folger, Rosenfield, Grove & Corkran, 1979).

Lind et al. (1980) found that a verdict, or outcome, did not affect perceptions of procedural justice in an experimental manipulation. However, the verdict was seen as fairer and more accurate when a fairer adversarial procedure was used compared with the non-adversary procedure. Lind and colleagues suggested that a possible explanation for the enhancement of distributive justice perceptions by a fair procedure may be the personal participation or process.
control that the adversary procedures afford in contrast to non-adversary procedures.

Lind and Lissak (1985) reported that favorable outcomes increased perceptions of procedural fairness. However, the effect was strongest when the decision maker enacting the procedures displayed a possible favoritism impropriety. Lind and Lissak suggest that when procedures are more or less perfectly enacted, outcomes may influence procedural justice judgements by generating a general affective influence. However, when procedures are less perfectly enacted, such as when an apparent impropriety exists, the outcomes may become a source of information as well as a source of affect. This may occur when the impropriety violates procedural expectations resulting in a fuller attributional process.

Leung and Li (1990) examined the influence of process control on both procedural and distributive justice perceptions. As predicted, the positive relationship between process control and procedural justice was moderated by the belief that one's views were being considered. The results also revealed that process control increased distributive justice perceptions when outcomes were low. Leung and Li suggested that people may examine unfavorable outcomes and their associated procedures in more detail than favorable outcomes to make sure they are justifiable and
acceptable. Consequently, process control will be attended to when outcomes are unfavorable. When outcomes are favorable, however, people may be less sensitive to procedural variations.

Greenberg (1987a) also found that fairer procedures lead to perceptions of fairer monetary outcomes, but only when the outcomes were low. Medium and high monetary outcomes were perceived to be fair regardless of the fairness of the procedures used to obtain the outcomes. The level of monetary outcomes had no effect on the perceived fairness of the procedures. This suggests that procedural justice may be a necessary precondition for distributive justice when outcomes are low.

Methodological issues in Greenberg’s experiment, however, limit a full test of the distributive and procedural justice relationship. Each pair of subjects received eight dollars, and the portion given to each of the subjects was determined by either fair or unfair procedures. The fairness of the procedure was manipulated by varying the explanation for the subject’s portion of the eight dollars. In the fair procedure condition, subjects were told that their share was determined by their performance relative to the performance of the other subject. In the unfair procedure condition, subjects were told that their share was determined by the room they had selected in the experiment.
Unfortunately, this fairness procedure manipulation confounded the fairness of the procedure with information on distributive justice. Subjects in the fair procedure condition were in effect told that their portion of the money was distributively fair, while subjects in the unfair procedure condition were not given this distributive justice information. The results showed that the outcomes in the fair procedure manipulation were always rated as fair. This is consistent with what would be expected due to the distributive justice information in this condition.

Landy et al. (1980) found that perceptions of process fairness were not related to outcomes, or performance appraisal ratings, of the individual. Similarly, Lind, Maccoun, Ebner, Felstiner, Hensler, Resnik, and Tyler (1990) found that objective outcomes were not related to procedural justice perceptions. In addition, the relationship between objective outcomes and distributive justice perceptions was very weak. This suggests that examining outcome level is not sufficient when examining the contributors to distributive justice perceptions. This is consistent with equity theory, which suggests that the outcomes of an individual are only one element in the equity ratio. Lind and colleagues did find however, that subjective evaluations of outcomes were related to both distributive and procedural justice perceptions. Subjective evaluations of outcomes are
defined as the evaluation of the outcome compared to what outcome level the individual expected.

In the area of reward distribution, Folger (1977) studied the affects of voice, or opinion expression, on procedural justice, distributive justice, and satisfaction. Subjects in the voice condition reported lower perceptions of distributive justice compared with subjects in the mute condition. This has been called the "frustration effect." It should be noted, however, that although subjects in the voice condition rated the fairness of the outcomes as lower, they rated the fairness of the procedures as higher than subjects in the mute condition.

Lind and Tyler (1988) proposed that the "frustration effect" may occur when the characteristics of the procedure which contribute to perceived fairness are relatively weak and outcomes are low. Individuals may then reevaluate the procedure for possible corruption in the decision making process and in the motives of the decision maker. If it appears that the decision maker is manipulating the procedures in order to mask personal gain, a frustration effect is more likely. Similarly, Cohen (1985) states that the frustration effect may be the result of employee awareness of a basic conflict of interest with employers. Because of this awareness, limited participation may be
interpreted as a strategic device to induce loyalty and commitment.

While Conlon, Lind, and Lissak (1989) found that in general, higher outcomes were associated with higher judgements of procedural justice, they also found that a moderately low outcome resulted in lower perceptions of procedural justice than a very low outcome. Conlon and colleagues suggested that this later finding may be due to subjects experiencing a lack of due consideration by the decision maker at the moderately low outcome level. This situation is analogous to waitresses and waiters feeling insulted more by a very small tip than no tip.

Conlon and Fasolo (1990) manipulated favorableness of outcome and speed of third party intervention in a competitive negotiation. Quick intervention by the third party was hypothesized to be procedurally unfair, while delayed intervention was hypothesized to be procedurally fair. Fast third party interventions resulted in lower distributive justice and procedural justice ratings. Distributive fairness increased as the outcomes increased at low and moderate prize levels, but peaked and then declined as the subjects obtained 3/4 of the total prize to be allocated. In addition, outcome levels were positively related to perceptions of procedural justice.
Ambrose, Harland and Kulik (1991) found that subjects who received a favorable outcome rated the procedure as more fair and satisfying. The procedural fairness manipulation, process control, did not influence outcome fairness or satisfaction. Musante, Gilbert and Thibaut (1983) found that subjects who were allowed to choose a decision rule in the fair procedure condition reported that both the procedures and the outcome were fairer compared with subjects in the yoked no choice condition. This effect did not depend on the role of the subject in the dispute (accuser or accused) or which rule was implemented.

Gilliland (1993) reported that the job relatedness of a selection procedure not only increased perceptions of procedural justice, but also to a lesser degree, distributive justice. In addition, the outcome of the hiring decision influenced both procedural and distributive justice, although the effect size for distributive justice was larger. Similarly, Walker et al. (1974) found that fairer trial procedures resulted in greater perceptions of justice and satisfaction for both the procedure and the verdict. These results were independent of the favorability of the verdict.

Kanfer, Sawyer, Earley and Lind (1987) manipulated influential opinion expression by asking subjects to write arguments on why they should receive a prize. In the high
influential opinion condition, these written arguments were presented to the decision maker. In the low influential opinion condition, the arguments were collected only after the experiment was concluded. Perceptions of procedural and distributive justice were enhanced in the high but not the low influential opinion condition, independent of the outcome of the evaluation. The high influential opinion condition was also positively related to perceptions of supervisor supportiveness.

Walker et al. (1974) found that fairer trial procedures resulted in greater perceptions of justice and satisfaction for the procedure and the verdict. Lind et al. (1980) conducted a similar trial simulation and obtained comparable results. They also reported that perceptions of procedural justice were not influenced by the outcome of the verdict.

Joy and Witt (1992) found that the individual difference variable, delay of gratification, moderated the relationship between procedural and distributive justice. Joy and Witt suggest that a positive relationship between procedural and distributive justice may only exist when individuals have a long-term view of organizational membership, and expect that over time all members will benefit from fair procedures. As predicted, among individuals who reported high levels of delay of gratification, procedural justice accounted for
significantly more variance in distributive justice, compared with low delay of gratification individuals.

The results of this review suggest that procedures may frequently affect distributive justice perceptions. Most studies reporting the results of this relationship have found that procedures influence distributive justice perceptions (e.g., Musante et al., 1983; Conlon & Fasolo, 1990). The results pertaining to outcome effects on procedural justice perceptions, however, have been somewhat evenly divided. While a number of studies have found that outcome levels positively influence procedural justice perceptions (e.g., Gilliland, 1993; Ambrose et al., 1991), others have found that outcomes had no effect on procedural justice perceptions (e.g., Lind et al., 1990; Landy et al., 1980). It is not clear, however, whether it is the absolute level of the outcome or the distributive fairness of the outcome that is responsible for the positive results. Outcome manipulations typically assume outcome levels to be equivalent to outcome fairness by comparing low inequitable outcomes with high equitable outcomes (Lind & Tyler, 1988).
Hypotheses

Equity theory postulates that individuals will compare the ratio of their inputs and outcomes to the ratio of a referent in order to assess the distributive fairness of outcomes. If the ratios are equivalent, the individual is expected to perceive their outcome as fair. In this study, referent input and outcome information will be held constant across all subjects. Specifically, subjects will be told that high inputs are associated with high outcomes, while low inputs are associated with low outcomes. Subjects with similar input and outcome ratios are predicted to experience greater distributive justice or fairness than subjects with dissimilar input and outcome ratios.

Hypothesis 1: The equitable outcome conditions (low input/low outcome and high input/high outcome conditions) will produce perceptions of greater distributive justice than the inequitable outcome conditions (low input/high outcome and high input/low outcome conditions).

Although equity theory would predict that outcomes alone would not be directly related to distributive justice, empirical evidence suggests that higher outcomes are seen as fairer than lower outcomes. This may be explained by egocentric bias (Greenberg, 1983a). This study also predicts that higher outcomes will increase distributive justice perceptions.

Hypothesis 2: The high outcome conditions will produce perceptions of greater distributive justice than the low outcome conditions.
An unresolved issue is whether procedures influence distributive justice perceptions. Justice theorists such as Thibaut and Walker (1975), and Leventhal (1976) have suggested this relationship. Past research has typically found a positive relationship between procedures and distributive justice (e.g., Lind et al., 1980; Walker et al., 1979). Consequently, a main effect of procedures on distributive justice perceptions is hypothesized in this study.

Hypothesis 3: Procedures with fair characteristics will produce perceptions of greater distributive justice than procedures with unfair characteristics.

It is likely that procedural justice perceptions mediate the relationship between procedures and distributive justice perceptions. Specifically, procedures may influence procedural justice perceptions, and procedural justice perceptions may subsequently influence distributive justice perceptions.

Hypothesis 4: Procedural justice perceptions will mediate the relationship between procedures and distributive justice perceptions.

The basic premise of procedural justice research is that individuals assess whether the procedures used to determine outcomes are fair. This finding has found consistent and strong empirical support (e.g., Greenberg, 1986; Sheppard & Lewicki, 1987).
Hypothesis 5: Procedures with fair characteristics will produce perceptions of greater procedural justice than procedures with unfair characteristics.

A number of researchers have proposed that outcomes may influence procedural justice perceptions. This may occur because outcomes provide information about the fairness of procedures, or possibly because egocentric bias resulting from outcomes may generalize to perceptions of procedures. Empirical evidence has been fairly equally divided. While a number of studies have found that outcome levels positively influence procedural justice perceptions (e.g., Lind & Lissak, 1985; Walker et al., 1974), other studies have found that outcomes had no effect on procedural justice perceptions (e.g., Landy et al., 1980; Lind, et al., 1980).

Past research examining the effects of outcomes on procedural justice have neglected equity theory issues, however. Specifically, the inputs of the subjects have not been accounted for, along with the input-outcome ratio. The sporadic finding in past studies that outcomes influence procedural justice perceptions may not have been due to the outcomes themselves but to input-outcome ratios influencing perceptions of procedural justice. Therefore, this study predicts that input-outcome ratios, instead of outcome levels alone, will be related to procedural justice perceptions.
Hypothesis 6: The equitable outcome conditions (low input/low outcome and high input/high outcome conditions) will produce perceptions of greater procedural justice than the inequitable outcome conditions (low input/high outcome and high input/low outcome conditions).

It is likely that distributive justice perceptions mediate the relationship between input/outcome ratios and procedural justice perceptions. Specifically, input/outcome ratios may influence distributive justice perceptions, and distributive justice perceptions may subsequently influence procedural justice perceptions.

Hypothesis 7: Distributive justice perceptions will mediate the relationship between input/outcome ratios and procedural justice perceptions.

Past literature suggests that procedural and distributive justice may have differential relationships with organizational outcome variables. Specifically, procedural justice has made substantially larger contributions than distributive justice to the variance of global organizational variables such as trust in management, organizational commitment and evaluation of supervisor (Alexander & Ruderman, 1987).

Since this investigation will utilize a short term laboratory task, variables such as trust in management and organizational commitment will not be relevant. Evaluation of supervisor, however, may be relevant to this methodology in which the experimenter is a surrogate supervisor. Evaluation of supervisor is typically assessed with measures that imply a long term employment relationship such as,
"Overall, I think my boss is a poor performer."

Consequently, a proxy measure, satisfaction with experimenter, will be used and is expected to be more related to procedural justice perceptions than to distributive justice perceptions.

**Hypothesis 8:** Procedural justice will account for more variance in satisfaction with the experimenter than will distributive justice.

Several studies have shown that distributive justice perceptions tend to be more related to satisfaction with pay than procedural justice perceptions (e.g., Folger & Konovsky, 1989; Konovsky et al., 1987). This study makes the same predictions for satisfaction with a bonus payment.

**Hypothesis 9:** Distributive justice will account for more variance in satisfaction with the bonus outcome than will procedural justice.
Method

Design

A 2x2x2 factorial design was used in which inputs (high, low), outcomes (high, low), and procedures (fair, unfair) were manipulated.

Subjects

Subjects were 120 undergraduate students at Virginia Tech, who volunteered to participate in exchange for course extra credit and possible bonus money. Undergraduate psychology students were solicited for participation in this study. Eleven additional subjects also participated in the study but their responses were not analyzed. Exclusion of these subjects is discussed in detail in the results section.

A separate sample of 123 undergraduate students participated in a pilot study. Undergraduate psychology students were solicited for participation in this pilot study, and volunteered to participate in exchange for course extra credit. Table 1 shows the demographic characteristics of both samples.

Procedure

One subject participated in each experimental session individually with an experimenter. The experimenter sat each subject in a cubicle and explained that the purpose of the study was to determine whether the design of catalogues
influenced how well people were able to use them. Subjects were told that in exchange for performing a catalogue searching task, they would receive one extra credit point and a possible bonus of five dollars.

The purpose of the experimental task was to provide a basis for the manipulation of inputs, outcomes and procedures. The experimental task selected was used by Greenberg (1987a) and was shown in previous research to be one in which subjects have no preconceived standards of productivity (Greenberg, 1983a). The task entailed locating pre-selected items in a department store catalogue (Brendles catalogue, 1993-1994) and copying the page numbers and prices of the items onto task sheets (see Appendix A).

The experimenter described the task and answered any questions. The subjects were then given the task sheets, pencils and catalogue necessary for the task, and were asked to perform the task quickly and accurately. The subjects were not able to see the work of other subjects, thus preventing them from assessing their relative performance on the task. The subjects performed the task for 25 minutes. The experimenter then scored the task in front of the subject using a task key (see Appendix B), collected all of the experimental materials, and told the subject that he or she would be back in a few minutes.
The experimenter returned to the cubicle after 2 minutes. Input level was manipulated by providing relative performance information using a bogus performance percentile chart. The bonus decision which determined whether the subjects would receive the bonus money was then made, either with an ostensibly fair procedure or an unfair procedure. All manipulations were implemented separately for each subject, in the presence of the experimenter only.

After the bonus distribution, each subject completed a questionnaire measuring task impressions, dependent variables and manipulation checks. Subjects were told that a second researcher would collect the questionnaires. This was done in order to reduce the effects of social desirability or self consciousness that the presence of first experimenter may have potentially provoked. The second researcher then collected the questionnaires, debriefed the subjects, and gave the five dollars to all subjects in the no bonus conditions.

Referent Information. Information on referents was necessary for the distributive justice comparison process. Subjects were expected to compare their inputs and outcomes to a relevant referent's inputs and outcomes. While inputs and outcomes of each subject were manipulated, referent information was held constant.
Although referents may be other individuals or one's own past experience, system referents have been proposed (Goodman, 1977; Landy & Becker, 1987). System referents provide general, system wide information regarding inputs and outcomes for the specific situation or system. This study utilized system referents which were held constant across all subjects. Specifically, subjects were told that above average performance levels on the task were associated with the $5 bonus, while below average performance levels were associated with no bonus payment. The experimenter stated, "We intended to give the $5 bonus to everyone who performed in the top 50 percent, or above the mean."

**Independent Variables**

**Inputs.** The subjects' inputs on the catalogue search task, or performance level, had two levels. In order to manipulate performance level, each subject was given a percentile chart based on their actual performance. This chart indicated that they performed in either the 15th (low performance) or 85th percentile (high performance) compared with other subjects on this task. This provided information on their relative performance or inputs. Because the subjects were denied any opportunity to assess their relative performance during the experimental task, this manipulation provided the only input or performance
information available to the subjects. (See Appendix C for example feedback charts.)

Procedures. One structural characteristic of the procedures used in order to distribute the bonus was manipulated, resulting in two procedural levels, fair and unfair. In the fair procedure condition, subjects were told that high performing subjects would have a greater chance of obtaining the bonus through a lottery system. In the unfair procedure condition, subjects were told that task performance would not affect their chances of receiving a bonus.

All subjects were told, "We intended to give the $5 bonus to everyone who performed in the top 50 percent, or above the mean. That way the subjects who did the best on the catalogue task would be rewarded."

Subjects in the fair procedure condition were told, "We don't have enough grant money, though, so we're going to distribute the money through a lottery system. All subjects will have at least a small chance to win the lottery, however, higher performing subjects will have a higher chance of winning. Subjects who performed in the top 25 percent will have 6 in 10 chances (60%) to win, subjects who performed between the 50th and 74th percentile will have 4 in 10 chances (40%) to win, subjects who performed between the 25th and 49th percentile will have 2 in 10 chances (20%)
to win, and subjects who performed in the bottom 25 percent will have 1 in 10 chances (10%) to win. Since you performed in the 15th (85th) percentile, you will have 1 (6) in 10 chances of winning the four dollar bonus."

The lottery system was implemented in the fair procedure condition by showing subjects the appropriate lottery slips and then inserting them into a box. The experimenter then shook the box and drew a predetermined slip secured to the inside of the box, which indicated whether the subject won or lost the bonus lottery.

In the unfair procedure condition, the subjects were told "We don't have enough grant money, though, so we're going to distribute the money through a type of lottery system. We're going to give the $5 to everyone who's last name starts with any of the letters __ through __." (See Appendix D for protocol.) The subject received the five dollar bonus if their last name started with any of the predetermined letters.

In order to ensure that subjects understood the performance percentile information described by the experimenter, the experimenter simultaneously pointed to the all relevant information on the bogus feedback percentile chart. For example, when the experimenter said, "We intended to give the $5 bonus to everyone who performed in the top 50 percent," the experimenter pointed to the 50th
percentile and the corresponding number indicating how many completed task items were associated with the 50th percentile.

A pilot study was conducted in order to determine the effectiveness of the proposed procedural fairness manipulation. Forty one subjects participated in this part of the pilot study, which required them to rate scenarios of the fair and unfair procedure manipulation (see Appendix E) on four procedural justice items (described later, see Appendix G). The procedural justice composite average score was 5.19 ($n = 21$, $SD = 1.83$) on a nine point scale for the fair procedure, and 3.00 ($n = 21$, $SD = 1.31$) for the unfair procedure. Based on this effect size, a cell size of 15 subjects in the main experiment was expected to be large enough to provide sufficient statistical power.

One potential source of confounding was the difference in time required in order to perform the fair and unfair procedure manipulation. Pre-experiment testing determined that the percentile lottery took approximately 90 seconds longer to implement than the last name lottery. In order to ensure that the amount of time required to implement the percentile lottery and last name lottery was held constant, the experimenter waited 90 seconds after providing the performance information during the last name manipulation before proceeding with the last name lottery. During this
time, the experimenter pretended to read and record information.

Leventhal's ethicality rule (which states that allocations must be based on prevailing moral and ethical standards) was violated in the unfair procedure condition but not in the fair procedure condition. Subjects were led to believe that task performance should affect the bonus distribution; however, this norm was arbitrarily disregarded in the unfair procedure condition. Thus, this distribution procedure violates normal allocation practices. In the fair procedure condition, normal allocation practices based on merit were followed.

Outcomes. In order to assess the appropriate monetary level of the bonus outcome, a measure of monetary psychological value was included in the pilot study. Pilot subjects (N = 123) were asked to rate how concerned they would be with the outcome of a bonus decision if the bonus was one dollar through ten dollars (see Appendix F).

The mean ratings for the bonus payment ranged from 3.09 for one dollar to 7.60 for ten dollars (see Figure 1). The standard deviations were very similar across the dollar amounts and ranged from 1.94 for eight dollars to 2.19 for four dollars. The five dollar bonus level was chosen for two reasons. First, the largest increase in ratings was .88, which occurred from four dollars to five dollars. The
rating increase from five dollars to six dollars was only .31. Second, the mean of five dollar rating was above the "moderate" scale anchor (M = 5.71), indicating that subjects would be at least moderately concerned with the outcome of the bonus decision. Consequently, outcome level was manipulated by paying subjects either no bonus money or a bonus of five dollars.

**Dependent Variables**

**Procedural Justice.** Procedural justice was measured with four items using a five point scale. See Appendix G. Items one and two are a modified version of those used by Konovsky et al. (1987) to measure the procedural fairness of pay raise decisions. The alpha coefficient of reliability for these two items was .87. The third and fourth items were a modified version of those used by Tyler (1991) to measure the procedural fairness of supervisor behavior. The alpha coefficient of reliability for these two items was .88. All original questions were modified to measure the procedural fairness of the bonus decision.

**Distributive Justice.** Distributive justice was measured with three items using a five point scale. See Appendix H. The items are a modified version of those used by Folger and Konovsky (1989) to measure the perceived fairness of pay raise decisions, adjusted to measure the perceived fairness of the bonus. The coefficient alpha
reliability estimate for the first two of the three items was .86. In addition, these items were previously reworded and used to measure the distributive fairness of classroom grades (Flinder & Hauenstein, 1993). The coefficient alpha reliability estimate for all three items in this study was .92.

Satisfaction with the Bonus Payment and the Experimenter. Satisfaction with outcomes was measured using modified questions from Alexander and Ruderman (1987), and Tyler and Caine (1981). Alexander and Ruderman utilized two questions to assess job satisfaction: "Indicate the extent to which you agree with the following statements: All in all, I am satisfied with my job; and, in general, I don’t like my job." The obtained coefficient alpha was .72. Tyler and Caine asked students to give an "overall quality rating" of a teacher in an experimental study. Each of these three questions was modified to measure both satisfaction with the bonus payment (see Appendix I) and the experimenter (see Appendix J).

Manipulation Checks

Manipulation checks for inputs and outcomes were obtained in order to verify that the manipulations were perceived by the subjects as intended. See Appendix K.
Analyses

Analyses were conducted using a 2x2x2 Analysis of Variance (ANOVA) for hypotheses 1, 2, 3, 5 and 6. Hypotheses 4, 7, 8 and 9 were tested using regression.
Results

Preliminary Analyses

Manipulation checks. Manipulation checks for input and outcome were obtained in order to verify that the manipulations were perceived by the subjects as intended (see Appendix K). The manipulation check for outcome, or receipt of the bonus payment, indicated that all subjects correctly reported whether they received the bonus during the experiment \( (N = 131) \).

A major source of concern was whether subjects believed the performance information manipulated during the experiment. The manipulation check for input, or performance compared to other subjects, suggested that the majority of subjects indicated that they had performed above average in the high input condition or that they had performed below average in the low input condition \( (n = 124) \). Seven subjects, however, indicated that they had performed average compared with other subjects. Four of these subjects were in the high input condition, while 3 were in the low input condition. The catalogue task scores of the 4 subjects in the high input condition were either very close to average \( (20, 24) \) or high \( (28, 30) \). The catalogue task scores of the 3 subjects in the low input condition were also very close to average \( (20, 21) \) or high \( (29) \). Due to the difficulty of interpreting the data from
these subjects in the analyses of hypotheses, these subjects were excluded from the study.

An additional check on the believability of the performance manipulation was to exclude all subjects who had performed either much higher or much lower than other subjects on the catalogue search task. Although the task was selected in order to ensure, as much as possible, that subjects did not have a preconceived standard of performance level, subjects with extreme scores on the task may have been less likely to believe the false performance information. Prior to the last data collection session, the task score mean (22.2) and standard deviation (6.4) was calculated using all available data (n = 121). Subjects who were more than two standard deviations above or below the mean were excluded from the data set. Two subjects scored in this range (9 and 37) and were excluded. The remaining subjects scored between 10 and 35.

The final manipulation check was a self-report assessment of the probability of receiving the bonus. This check was only relevant for the fair procedure conditions in which the percentile lottery was used, because specific odds of winning the lottery were given only in these conditions. The majority of the subjects in the fair procedure conditions indicated the appropriate probability of winning the lottery. Thirty-five subjects in the high performance
condition reported that they had an approximately 60% chance of winning and 31 subjects in the low performance condition reported that they had an approximately 10% chance of winning. One subject in the high performance, low outcome condition, however, indicated that they had a 0% chance of winning, while one subject in the low performance, low outcome condition indicated that they had a 100% chance of winning. These subjects were excluded from further analyses because it appeared from these responses and from the debriefing that they did not believe that the percentile lottery was real or unbiased.

In summary, 131 subjects participated in the experiment. A total of eleven subjects were eliminated from the analyses, leaving 120 subjects (15 per cell). Seven subjects were eliminated because they indicated that their performance was average, two subjects were eliminated because they scored more than two standard deviations away from the task score mean, and two subjects were eliminated because they did not indicate the appropriate probability of winning the percentile lottery.

**Composite measurement scales.** All multiple item scales (procedural justice, distributive justice, satisfaction with experimenter, satisfaction with outcome) were examined in order to ensure that each scale was reliable.
The coefficient alpha for the four procedural justice items was .89. Although the internal consistency estimate was acceptable, item 3 was potentially problematic because coefficient alpha without item 3 rose to .91, and the correlation between item 3 and the total was substantially lower ($r = .58$) than the other three items (item 1, $r = .78$; item 2, $r = .87$; item 4, $r = .83$).

The coefficient alpha for the three distributive justice items was .65, which was quite low. Item 1 was omitted because the correlation between item 1 and the total of all three items was low, .20, and the internal consistency estimate without this item increased to .86.

In addition to examining coefficient alphas of the justice scales, an exploratory factor analysis was performed using all of the justice items. A common factor model was analyzed using Harris-Kaiser oblique rotation. The results are presented in Table 2. Items 1, 2 and 4 of the procedural justice scale had high loadings on the first factor (labeled Procedural Justice) and low loadings on the second factor (labeled Distributive Justice). Item 3, however, had a relatively low loading on both factors. Due to this evidence, and the increase in internal consistency which resulted from omitting this item, item 3 was removed from the composite scale for procedural justice. Items 2 and 3 of the distributive justice scale had high loadings on
the Distributive Justice factor and low loadings on the Procedural Justice factor. Consistent with the internal consistency results, item 1 had a low loading on both factors.

The coefficient alpha for all three satisfaction with experimenter items was .72. Item 2 was omitted because the correlation between item 2 and the total of all three items was low ($\rho = .34$) and the internal consistency estimate without this item increased to .91. The coefficient alpha for the three satisfaction with outcome items was .86. Item 2 had the lowest item total correlation ($\rho = .67$), however, removing item 2 increased coefficient alpha only slightly (coefficient alpha = .87).

In addition to examining coefficient alpha of the satisfaction scales, an exploratory factor analysis was performed using all of the satisfaction items. A common factor model was analyzed using Harris-Kaiser oblique rotation. The results are presented in Table 3. Items 1 and 3 of the satisfaction with the experimenter scale had high loadings on the first factor (labeled Satisfaction with Experimenter) and low loadings on the second factor (labeled Satisfaction with Outcome). Consistent with the internal consistency analysis, item 2 had a relatively low loading on both factors.
All of the satisfaction with outcome items had high loadings on the Satisfaction with Outcome factor, and low loadings on the Satisfaction with Experimenter factor. The results of both the factor analysis and coefficient alpha suggest that all three satisfaction with outcome items are appropriate to include in the composite scale.

**Descriptive Statistics.** Table 4 shows the cell means and standard deviations of the measures of procedural justice, distributive justice, satisfaction with experimenter, satisfaction with outcome, and catalogue task score. Table 5 shows coefficient alpha reliabilities and intercorrelations among the measures.

**Control variables.** Because three experimenters were used, individual differences in the experimenters may have influenced the results. Potential experimenter effects were examined in order to assess this potential confound. One-way analysis of variance (ANOVA) using experimenter as the independent variable revealed no significant differences based on procedural justice ($F(2, 116) = .29, p > .10$), distributive justice ($F(2, 112) = .49, p > .10$), satisfaction with experimenter ($F(2, 116) = .15, p > .10$) or satisfaction with outcome ($F(2, 116) = .56, p > .10$).

Although extremely high and low task score performers were excluded from the study, there still remained a chance that actual task score performance may have been related to
the dependent variables. Correlation analysis (see Table 5) did not reveal a significant relationship between task score and procedural justice ($r = -0.04, p > .10$), distributive justice ($r = -0.03, p > .10$), satisfaction with experimenter ($r = 0.10, p > .10$) or satisfaction with outcome ($r = -0.06, p > .10$). Therefore, actual task performance cannot provide alternative explanations for the findings.

One area of concern was whether the order of questionnaire items would influence the results. In particular, would responses to procedural justice items be influenced by prior responses to distributive justice items, or would responses to distributive justice items be influenced by prior responses to procedural justice items? In order to investigate these potential effects, the distributive justice items and the procedural justice items were counterbalanced. Within each procedural and distributive justice block of items, the item order remained constant. The results of t-tests revealed that the placement of the justice item blocks did not significantly effect responses to the composite ratings of procedural justice ($t(117) = 1.37, p > .10$) or distributive justice ($t(113) = 0.84, p > .10$)

Analysis of Hypotheses

Hypothesis 1. Hypothesis 1 predicted that the equitable outcome conditions (low input/low outcome and high
input/high outcome conditions) would produce perceptions of greater distributive justice than the inequitable outcome conditions (low input/high outcome and high input/low outcome conditions). A three-factor (input x outcome x procedure) ANOVA (see Table 6) did not reveal a significant two-way interaction for input and outcome ($F(1, 107) = 2.17, p > .10$). This three-factor ANOVA did reveal, however, a significant three-way interaction ($F(1, 107) = 4.92, p < .05$).

In order to examine the input/outcome relationship separately for both procedure levels, two-factor (input x outcome) ANOVAs were tested for the fair and unfair procedure conditions. In the unfair procedure condition (see Table 7), the predicted interaction was not significant ($F(1, 52) = .02, p > .10$). The main effect for outcome was significant ($F(1, 52) = 14.00, p < .001$). For subjects in the unfair procedure conditions, the input and outcome ratios did not affect distributive justice ratings; however, high outcomes resulted in higher distributive justice ratings ($M = 4.24$) than low outcomes ($M = 2.83$).

In the fair procedure condition (see Table 8), the predicted outcome by input interaction was significant ($F(1, 55) = 8.56, p < .01$). In addition, the main effect for outcome was also significant ($F(1, 55) = 24.66, p < .001$). The effect of outcomes on distributive justice within each
of the two input levels was assessed using simple main effects tests. Simple main effects computational procedures described by Winer (1971) were performed, assuming equal cell sizes. The simple main effect of outcome in the high input conditions was significant ($F(1, 56) = 31.73, p < .01$), while the simple main effect of outcome in the low input conditions was not significant ($F(1, 56) = 1.95, p > .10$).

Examination of the direction of the interaction in the fair procedure condition suggests that the results were consistent with the hypothesis 1 for 3 of the 4 groups (see Figure 2). As expected, in the high input conditions, subjects who received the bonus rated distributive justice higher ($M = 4.80$) than subjects who did not receive the bonus ($M = 2.40$). In the low input conditions, however, distributive justice ratings of the high outcome condition were higher ($M = 4.17$) than the ratings of the low outcome condition ($M = 3.57$). In the fair procedure conditions, subjects who received equitable input and outcome ratios rated distributive justice high, as predicted. In addition, subjects who receive an inequitable, low outcome rated distributive justice low, as predicted. The relatively high distributive justice rating for the low input, high outcome group, however, was inconsistent with hypothesis 1.
**Hypothesis 2.** Hypothesis 2 predicted that the high outcome conditions would produce perceptions of greater distributive justice than the low outcome conditions. A three-factor (input x outcome x procedure) ANOVA (see Table 6) revealed a significant main effect for outcomes ($F(1, 107) = 36.79, p < .001$). Collapsing across input and procedure, the mean distributive justice rating was 4.36 for the high outcome conditions, and 2.90 for the low outcome conditions. In addition, the means of all high outcome cells were higher than the means of all low outcome cells. Subjects who received high outcomes rated distributive justice higher than subjects who received low outcomes. Hypothesis 2 was supported.

**Hypothesis 3.** Hypothesis 3 predicted that procedures with fair characteristics would produce perceptions of greater distributive justice than procedures with unfair characteristics. A three factor (input x outcome x procedure) ANOVA (see Table 6) for distributive justice did not reveal the predicted main effect for procedure ($F(1, 107) = .53, p > .10$).

Due to the significant three way interaction for distributive justice described in the test of the first hypothesis, additional analyses were conducted. The effect of procedures on distributive justice within each of the four input/outcome cells was assessed using simple main
effects tests. The simple main effects of procedures on distributive justice in the high input/high outcome cell (F(1, 112) = 1.01, p > .10) and low input/high outcome cell (F(1, 112) = .00, p > .10) were not significant. The distributive justice ratings of subjects who received a high outcome were not affected by the fairness of the procedure.

The simple main effects of procedures in the low input/low outcome cell was significant (F(1, 112) = 6.72, p < .05). As predicted, the mean distributive justice rating in the low input/low outcome cells was higher for the fair procedure condition (M = 3.57) than for the unfair procedure condition (M = 2.53). The simple main effect of procedures in the high input/low outcome cell was marginally significant (F(1, 112) = 2.85, p < .10), because the mean distributive justice rating was lower in the fair procedure condition (M = 2.40) than in the unfair procedure condition (M = 3.15). (See Figure 3.) For subjects with low inputs and low outcomes, fair procedures resulted in higher distributive justice ratings than unfair procedures. For subjects with high inputs and low outcomes, however, the reverse was found. Unexpectedly, high input subjects who did not receive the bonus rated distributive justice lower when fair procedures were used, in comparison to unfair procedures.
In summary, hypothesis 3 predicted that procedures with fair characteristics would produce perceptions of greater distributive justice than procedures with unfair characteristics. The main effect for procedure was not significant, and due to a significant three-way interaction, the effect of procedures was assessed separately in each of the four input and outcome cells. Procedures did not influence distributive justice in both high outcome cells. When outcomes were low and inputs were low, fair procedures increased distributive justice ratings. When outcomes were low and inputs were high, however, fair procedures decreased distributive justice ratings. Thus, hypothesis 3 was supported only in the low outcome and low input conditions.

**Hypothesis 4.** Hypothesis 4 predicted that procedural justice perceptions would mediate the relationship between procedures and distributive justice perceptions. The test for mediation was performed using the regression approach suggested by Baron and Kenny (1986). First, the mediator is regressed on the independent variable. Second, the dependent variable is regressed on the independent variable. Third, the dependent variable is regressed on both the independent variable and the mediator. In order to establish the mediation relationship, the independent variable must affect the mediator in the first equation, the independent variable must affect the dependent variable in
the second equation, and the mediator must affect the dependent variable in the third equation. In addition, a fully mediated model would result in no effect of the independent variable on the dependent variable in the third equation, when the independent variable is added to the model after the mediator.

In addition to the sequence of analyses proposed by Baron and Kenny, a fourth step was added. Before regressing the dependent variable on both the independent variable and the mediator, the dependent variable was regressed on the mediator alone. This step was added in order to assess the effect of the mediator alone on the independent variable. This relationship should be significant.

In order to test the mediation relationship of hypothesis 4, the first regression equation tested the effects of procedures, the independent variable, on procedural justice, the mediator (see Table 9). This relationship was significant ($\beta = .24, p < .01$). The second regression equation tested the effects of procedures on distributive justice, the dependent variable. This relationship was not significant ($\beta = .06, p > .10$). This result was not surprising considering the general finding in hypothesis 3, that procedures did not affect distributive justice perceptions in the full design (see Table 6). Due to the lack of effect of procedures on distributive justice,
the mediation hypothesis was not supported for the full design.

Since further analyses of hypothesis 3 revealed that fair procedures increased distributive justice perceptions as predicted for subjects in the low input/low outcome conditions, further mediation analyses were performed for this subset of subjects (see Table 10). The first regression equation tested the effect of procedure on procedural justice. This relationship was not significant ($\beta = .01, p > .10$). In addition, the effect of procedure on distributive justice was not significant ($\beta = -.26, p > .10$). Since the procedures did not affect procedural justice or distributive justice within the low input/low outcome subset of subjects, further mediational analyses were not conducted. In summary, neither of the analyses examining the potential mediation of the procedure and distributive justice relationship demonstrated the existence of the procedural justice mediator. In particular, neither examination established the necessary significant relationship between procedures and distributive justice. Hypothesis 4 was not supported.

To summarize the findings when distributive justice was the dependent variable, when procedures were fair, equitable input and outcome ratios tended to increase perceptions of distributive justice as predicted. High outcomes and low
inputs, however, did not result in low distributive justice ratings, as expected. This result is not inconsistent with the predicted finding pertaining to outcomes, in which it was shown that high outcome levels alone increased distributive justice perceptions. When procedures were unfair, a different pattern of results emerged; input and outcome ratios did not affect distributive justice perceptions. Outcomes alone, however, had a strong effect on distributive justice ratings.

The effects of procedures on distributive justice perceptions were limited and inconsistent. Procedures had no effect on distributive justice when outcomes were high. When both outcomes and inputs were low, fair procedures increased distributive justice ratings. When outcomes were low and inputs were high, fair procedures decreased distributive justice ratings in comparison to unfair procedures. In addition, procedural justice was not found to be a mediator in the relationship between procedures and distributive justice. As stated above, however, although procedures had a limited effect on distributive justice perceptions directly, they clearly had a strong effect on the information used to make distributive justice judgements. When fair procedures were used, both outcome level and input and outcome ratios influenced distributive justice perceptions. However, when unfair procedures were
used, outcome level alone influenced distributive justice perceptions.

**Hypothesis 5.** Hypothesis 5 predicted that procedures with fair characteristics would produce perceptions of greater procedural justice than procedures with unfair characteristics. A three-factor (input x outcome x procedure) ANOVA (see Table 11) for procedural justice ratings revealed a significant main effect for procedures ($F(1, 111) = 8.00, p < .01$). Collapsing across inputs and outcomes, the mean procedural justice rating was 3.90 for the fair procedure conditions, and 3.26 for the unfair procedure conditions. In addition, when outcome and input levels were held constant, the means of the fair procedure cells were higher than the means of the unfair procedure cells. When the bonus outcome decision was made with a fair procedure, subjects rated procedural justice higher than when an unfair procedure was used. Hypothesis 5 was supported.

**Hypothesis 6.** Hypothesis 6 predicted that the equitable outcome conditions (low input/low outcome and high input/high outcome conditions) would produce perceptions of greater procedural justice than the inequitable outcome conditions (low input/high outcome and high input/low outcome conditions). A three factor (input x outcome x procedure) ANOVA revealed a marginal two-way interaction for
input and outcome ($F(1, 111) = 3.08, p < .08$). See Table 11. The main effect for outcome was also significant ($F(1, 111) = 6.18, p < .05$). The effect of outcome on procedural justice within each of the two input levels was assessed using simple main effects tests. The simple main effect of outcome in the high input level was significant ($F(1, 112) = 9.19, p < .01$), while the simple main effect of outcome in the low input level was not significant ($F(1, 112) = .31, p > .10$).

Examination of the marginal interaction suggested that the results were consistent with hypothesis 6 for 3 of the 4 groups (see Figure 4). As expected, in the high input conditions, subjects who received the bonus rated procedural justice higher ($M = 3.87$), than subjects who did not receive the bonus ($M = 2.90$). In the low input conditions, there was no difference in the mean procedural justice ratings of the high ($M = 3.87$) and low ($M = 3.69$) outcome conditions. In general, fair input and outcome ratios resulted in higher procedural justice ratings than unfair input and outcome ratios; however, high outcomes also increased procedural justice ratings. The relatively high procedural justice rating for the low input, high outcome group was inconsistent with hypothesis 6.

**Hypothesis 7.** Hypothesis 7 predicted that distributive justice perceptions would mediate the relationship between
input/outcome ratios and procedural justice perceptions. In order to test the mediation relationship, a new variable, equitable outcomes, was formed. Equitable outcomes, which combined the input and outcome variables, and had two levels, fair (high input/high outcome and low input/low outcome) and unfair (low input/high outcome and high input/low outcome). The first regression equation tested the effects of equitable outcomes, the independent variable, on distributive justice, the mediator. The relationship between equitable outcomes and distributive justice was not significant ($B = .12, p > .10$). See Table 12. This finding was not surprising given the three-way interaction found for distributive justice (see Table 6). The second regression equation tested the effects of equitable outcomes on procedural justice, the dependent variable. This relationship was also not significant ($B = .15, p > .10$). Again, this finding was not surprising given that the input and outcome interaction found for procedural justice (see Table 11) was only marginally significant. Since equitable outcomes did not affect distributive justice or procedural justice, the mediational analyses were not completed for the full design.

Analysis of hypothesis 1 suggested that interaction of inputs and outcomes significantly affected distributive justice perceptions only when procedures were fair.
Therefore, hypothesis 7 was tested separately for the fair and unfair procedure conditions. In the fair procedure condition, the mediating effects of distributive justice perceptions were tested for the equitable outcomes and procedural justice relationship. In order to test this mediation relationship, the first regression equation tested the effects of equitable outcomes, the independent variable, on distributive justice, the mediator. The relationship between equitable outcomes and distributive justice was significant ($b = .32, p < .01$). See Table 13. The second regression equation tested the effects of equitable outcomes on procedural justice, the dependent variable. This relationship was significant ($b = .30, p < .05$). The third regression equation tested the relationship between distributive justice and procedural justice. This relationship was significant ($b = .78, p < .001$). The fourth regression equation tested the effects of both equitable outcomes and distributive justice on procedural justice. With equitable outcomes already included in the model, the relationship between distributive justice and procedural justice was significant ($b = .77, p < .001$), suggesting that the mediating relationship occurred. In order to determine whether the model was fully mediated, the effect of equitable outcomes was assessed when distributive justice was already included in the model. This
relationship was not significant ($B = .04, p > .10$), suggesting that distributive justice perceptions fully mediated the relationship between equitable outcomes and procedural justice perceptions, in the fair procedure conditions.

Outcome, but not the interaction of input and outcome, was shown to affect distributive justice in the unfair procedure conditions (see Table 7). Consequently, in the unfair procedure condition, the mediating effect of distributive justice was tested for the outcome and procedural justice relationship. In order to test this mediation relationship, the first regression equation tested the effects of outcome, the independent variable, on distributive justice, the mediator (See Table 14). The relationship between outcome and distributive justice was significant ($B = .46, p < .001$). The second regression equation tested the effects of outcome on procedural justice, the dependent variable. This relationship was not significant ($B = .09, p > .10$). Because the bonus outcome did not affect procedural justice within the unfair procedure subset of subjects, further mediation analyses were not performed. The relationship between outcome fairness and procedural justice was fully mediated by distributive justice perceptions, when fair procedures were used. When unfair procedures were used, however, no
mediating relationship was found. Hypothesis 7 was supported for the fair procedure condition only.

To summarize the findings when procedural justice was the dependent variable, procedures were found to affect procedural justice as predicted. In addition, the equitableness of outcomes also affected procedural justice as predicted when inputs were high. When inputs were low, however, high outcomes did not result in lower ratings of procedural justice as expected. This is consistent with the unpredicted general finding that high outcomes increased procedural justice ratings. When input and outcome ratios were found to affect procedural justice (when procedure were fair), this relationship was fully mediated by distributive justice perceptions.

**Hypothesis 8.** Procedural justice was thought to be more related than distributive justice to global organizational variables such as supervisor satisfaction. Analogously, hypothesis 8 predicted that procedural justice would account for more variance in satisfaction with the experimenter than would distributive justice. This hypothesis was analyzed using regression, by determining the unique contribution of each justice variable to satisfaction with experimenter after the other justice variable had already been entered into the regression model. In order to determine the unique contribution of procedural justice,
distributive justice was entered into the regression equation at step 1. At step 2, procedural and distributive justice were both included in the model. The change in variance accounted for from step 1 to step 2 ($R^2$ change = .04, $p < .01$) determined the unique contribution of procedural justice. The unique contribution of distributive justice ($R^2$ change = .11, $p < .01$) was determined similarly. Although both procedural and distributive justice accounted for significant unique variance, distributive justice contributed more unique variance than procedural justice.

Hypothesis 8 was not supported.

**Hypothesis 9.** Hypothesis 9 predicted that distributive justice would account for more variance in satisfaction with the bonus outcome than would procedural justice, because distributive justice has been found to be more related to satisfaction with personal specific outcomes. This hypothesis was analyzed using the same approach as hypothesis 8; the unique contribution of each justice variable was determined after the other had already been entered into the regression model. In order to determine the unique contribution of distributive justice, procedural justice was entered into the regression equation at step 1. At step 2, distributive and procedural justice were both included in the model. The change in variance accounted for from step 1 to step 2 ($R^2$ change = .37, $p < .01$) determined
the unique contribution of distributive justice. The unique
correlation of procedural justice ($R^2$ change = .00, $p >$
.10) was determined in the same way. Distributive justice
contributed more unique variance than procedural justice to
satisfaction with outcome. Hypothesis 9 was supported.
Discussion

The main purpose of this study was to investigate whether the separate contributors to procedural and distributive justice also affected the other form of justice. Previous research investigating these cross over effects of justice contributors had not examined inputs in addition to outcomes and procedures, and had typically assumed outcome level to be equivalent to the equitableness of outcomes.

The first area of focus addressed whether the fairness of procedures used in an allocation decision influenced the perceived fairness of the resulting outcomes. The results of this study suggest that the effect of procedures on distributive justice perceptions are variable and limited. Procedures were not found to have any influence on distributive justice perceptions when outcomes were high. When outcomes were low, however, procedures had a differing influence on distributive justice, depending on the input level. When inputs, or performance level, was low and outcomes were low, the predicted pattern emerged; fair procedures led to perceptions of greater distributive justice. When inputs were high and outcomes were low, however, fair procedures decreased perceptions of distributive justice.
A possible explanation for this variable finding may be that when a fair procedure did not result in a fair outcome this may have made the distributive injustice even more salient. Specifically, fair procedures may have caused subjects to expect fair outcomes which were not subsequently received, or there may have been a contrast between the fairness of the procedures and the fairness of the outcome. A replication of this interaction, and a subsequent investigation into the causal determinants of the differential impact of procedures, is needed.

A number of theorists have suggested that procedures may influence distributive justice perceptions. For example, Leventhal (1976) suggested that individuals may believe that procedural fairness is a necessary precondition for the establishment of distributive fairness, because distributive fairness is likely to be violated unless procedural justice exists. Therefore, unless proper procedures are used, the fairness of outcomes will be doubted. Thibaut and Walker (1975) also proposed that fairer procedures would lead to perceptions of fairer outcomes, due to a possible perceptual overlap between distributive and procedural justice. In addition, Morgan and Sawyer (1979) suggested that in most social situations individuals have difficulty evaluating the value of social exchanges and social status characteristics. In these
conditions, individuals may use procedural rather than distributive cues to determine whether justice has occurred. As Morgan and Sawyer stated, "If the expected procedure has been followed, then the actors are generally satisfied with the outcome" (p. 71).

Leventhal (1976) and Thibaut and Walker (1975) both proposed similar ideas regarding how procedures may affect distributive justice perceptions. Thibaut and Walker focused on perceptual overlap between justice perceptions, whereas Leventhal suggested that procedural justice may be a necessary precondition for distributive justice. Since both of these arguments suggest a general effect of procedures on distributive justice, one conclusion given the results of this study, is that the conceptual arguments of both Thibaut and Walker, and Leventhal are too strong. In this study, fair procedures increased distributive justice ratings for only a small subset of subjects. In addition, fair procedures actually decreased distributive justice perceptions in some conditions.

Morgan and Sawyer (1979), however, proposed that difficulty in evaluating the value of social exchanges is the causal mechanism responsible for the effect of procedures on distributive justice perceptions. Subjects in the current study may have had no difficulty, or merely limited difficulty, in evaluating the value of social
exchanges. According to Morgan and Sawyer's arguments, the effect of procedures on distributive justice perceptions would not be strong under these conditions. This is consistent with the results of the current study. The unexpected finding that fair procedures actually decreased distributive justice perceptions in some conditions, however, is problematic for their conceptualization.

Procedural justice perceptions were also hypothesized to mediate the relationship between procedures and distributive justice perceptions. When the mediation relationship was tested, however, procedures did not influence distributive justice perceptions. In addition, the mediation relationship was also tested for the subset of subjects where procedures were shown to affect distributive justice. Again, the mediating effect of procedural justice perceptions was not established; in the subset of subjects where procedures did influence distributive justice perceptions, the effect was not mediated by procedural justice perceptions.

In addition to the theoretical arguments for a procedure cross over effect, many empiricists have also examined this issue. Prior results have consistently suggested that fair procedures had a positive impact on distributive justice perceptions (e.g., Gilliland, 1983; Lind et al., 1980). Due to the limited impact of procedures
on distributive justice perceptions in this study, a
examination of any methodological differences is warranted.
One explanation is that some previous research has
confounded procedure manipulations with information on
distributive justice. For example, an experiment by
Greenberg (1987a) was confounded in this manner. As would
be expected due to the nature of the confound, Greenberg’s
results suggested that fair procedures always resulted in
fair outcomes. The present study effectively unconfounded
these issues, and has clearly drawn much different
conclusions.

An interesting and unexpected finding was the effect of
procedures on the information used to form distributive
justice perceptions. Although outcome level strongly
influenced distributive justice perceptions regardless of
the fairness of procedures, the equitableness of outcomes
also influenced distributive justice perceptions. When
procedures were fair, the equitableness of outcomes
influenced distributive justice ratings. When procedures
were unfair, however, the equitableness of outcomes did not
influence distributive justice judgements. Apparently,
individuals disregard equity as a distributive fairness
standard when it is clear that procedures are unfair.
Individuals may instead take a hedonistic view that their
own high outcomes are distributively 'fairest.' Future
research would clearly benefit from a replication of this finding.

The second general issue investigated in this study is the identification of the contributors to procedural justice perceptions. Specifically of interest was whether the fairness of outcomes resulting from decision procedures influenced the perceived fairness of procedures. Past literature examining the effects of outcomes alone on procedural justice perceptions had been fairly evenly divided. A number of studies have found that outcome levels positively influenced procedural justice perceptions (e.g., Lind & Lissak, 1985; Walker et al., 1974), however, others have found that outcomes had no effect on procedural justice perceptions (e.g., Landy et al., 1980; Lind et al., 1980).

Studies examining this question, however, tended to assume that outcome level was equivalent to outcome fairness (e.g., Greenberg, 1987a). Due to this assumption and the inconsistent past findings, an alternative explanation was explored in this study. Specifically, it was hypothesized that the equitableness of outcomes, and not the outcome level, influenced procedural justice perceptions. The results of this study suggested that the equitableness of outcomes increased procedural justice perceptions; however, high outcomes also increased procedural justice perceptions. Although the examination of the equitableness of outcomes
did not eliminate outcome level as a causal agent, these findings suggest that outcome equity can be an important consideration in procedural justice judgements. Consequently, previous studies may have obtained conflicting results because they did not examine the equitableness of outcomes.

Researchers have proposed causal mechanisms by which outcomes may influence procedural justice perceptions. One explanation is egocentric bias, which is used to explain why higher outcomes are generally seen as more equitable than lower outcomes (Greenberg, 1983b). Egocentric bias resulting from outcomes may generalize to perceptions of procedures. This may explain any findings of a relationship between outcomes and procedural justice perceptions (Greenberg, 1987a). In addition, Lind and Tyler (1988) have suggested that outcome levels may provide "information" about the fairness of procedures, and may be used to infer whether procedures are fair. Lind et al. (1980) suggested that low outcomes may invoke an attributional process which may result in the perception that an apparently fair procedure had been somehow corrupted.

Although this study did not specifically examine the causal mechanism by which outcomes alone influenced procedural justice perceptions, it is clear from the results that egocentric bias could only be a partial explanation.
One reason is the effect of the equitableness of outcomes, in addition to outcome level, on procedural justice perceptions. In addition, when procedures were fair, the effect of the equitableness of outcomes was fully mediated by distributive justice perceptions. Due to this effect of the fairness of outcomes and not solely the outcome level, these findings are more consistent with the suggestion that outcomes may provide information about the fairness of procedures, or may used to infer whether procedures are fair. If outcomes are found to be distributively fair, then procedures may be viewed as fairer.

It is possible that contributors to one form of justice may effect the other form of justice, or have a cross over effect, more often in relatively ambiguous settings. In the experimental design employed in this study, many of the conditions that may have potentially led to cross over effects, especially of procedures, may have been reduced. Specifically, there was relatively little ambiguity concerning inputs and outcomes that may be present more commonly in other settings. For example, subjects were given clear performance information which indicated that they performed either poorly or very well compared with other subjects. In addition, subjects knew they would either receive or not receive a five dollar bonus. Lastly, the referent information was clear, and held constant across
subjects. Due to this lack of ambiguity, subjects may have been able to more easily discern whether their outcome was distributively just, without having to resort to the use of additional information about procedures.

It may be that in this study, the fairness of procedures was more ambiguous and relatively difficult to evaluate, compared with the fairness of outcomes. This would explain the more consistent findings of outcome level and outcome fairness affecting procedural justice perceptions, and the fairness of procedures having a limited influence on distributive justice perceptions. Although theorists who have suggested that outcomes may influence procedural justice by means of egocentric bias may be partially correct, an investigation into when contributors to both forms justice perceptions provide 'information' for the other form of justice could be very informative.

Thus, a potentially productive area of future research would be an investigation of the moderating effect of situational ambiguity on the procedure and distributive justice relationship. The establishment of such a moderating relationship has the potential to explain when cross over effects between justice contributors are likely. In situations where the information about contributors to justice perceptions is relatively clear, as possibly
occurred in this study, a smaller cross over effect of justice contributors would be expected.

An overwhelming effect of outcomes was found for both procedural and distributive justice judgements. This finding replicates past findings demonstrating the effect of outcome level on procedural (e.g., Ambrose et al., 1991) and distributive justice perceptions (e.g., Greenberg, 1987b), and suggests that actual outcome levels are extremely important to justice perceptions, even though equity theory and procedural justice models would not predict this effect.

Affective mood states is one possible explanation for the strong effect of outcomes found in the current study. Research suggests that individuals may use their affective mood states as information relevant to various kinds of judgements, such as perceptions of general life satisfaction (Schwarz & Clore, 1983; Schwarz, Strack, Kommer & Wagner, 1987). In the current study, outcome levels may have induced mood states that were used as information in both distributive and procedural justice judgements. A follow-up study which independently manipulates mood states and outcomes would provide insight into the validity of this potential explanation.

In addition to the effect of outcomes on both procedural and distributive justice, the equitableness of outcomes, or input and outcome ratios, had a similar
influence on both procedural and distributive justice perceptions. In this study, equitable input and outcome ratios increased procedural justice perceptions. While the cross over effects of outcomes alone has been addressed in past research investigating contributors to procedural justice perceptions, the effects of inputs, and more importantly the interaction between outcomes and inputs, has not been assessed (e.g., Lind & Lissak, 1985). Because the interaction of inputs and outcomes are shown to affect procedural justice ratings, these studies are clearly neglecting an important determinant of procedural justice perceptions.

As equity theory predicts, equitable input and outcome ratios increased distributive justice perceptions; however, this effect occurred only when procedures were fair. These results clearly suggest that the interaction between inputs and outcomes contributes to equity perceptions under some conditions. When procedures were unfair, however, outcome level only, and not the equitableness of outcomes, influenced distributive justice perceptions. It is helpful to consider this finding in terms of the theoretical basis of equity theory. According to Walster et al. (1973), equity theory is based on the assumption that individuals are motivated to maximize their outcomes. Building on this assumption, groups will act in their own collective self-
interest by developing rules, such as equity, for allocating resources (also Walster et al., 1978). When procedures are unfair, individuals may then disregard equity as a distributive fairness standard. Individuals may instead take a hedonistic view that given the unfairness of the procedures, high outcomes are distributively 'fairest.' This effect of procedures on the information used to form distributive justice perceptions establishes boundary conditions for equity theory and highlights the need to consider the effects of procedural fairness when investigating equity theory.

In addition to examining the contributors to justice perceptions, this study also examined the consequences of justice perceptions. Researchers had suggested that distributive justice may be more closely related to satisfaction with specific personal outcomes, whereas procedural justice may be more closely related to measures of global satisfaction (Lind & Tyler, 1988). The results of this study suggest that distributive justice was more closely related to both satisfaction measures. As expected, distributive justice had a stronger relationship with satisfaction with the bonus outcome, however, it was also more strongly related to the proxy measure of global satisfaction, satisfaction with the experimenter. This
unexpected finding may have been due to the short term nature of this experimental design.

One implication of this study for organizations is that outcomes are very important. Outcome levels strongly affected both distributive and procedural justice perceptions. Although procedures did not influence the fairness ratings of outcomes, this should not be interpreted as an indication of the relative unimportance of procedures. Clearly, procedures influenced procedural justice ratings. Although the present study did not show that procedural justice perceptions contributed more than distributive justice perceptions to the measure of experimenter satisfaction, past research has demonstrated the importance of procedural justice perceptions in organizational settings (e.g., Alexander & Ruderman, 1987; Folger & Konovsky, 1989).

Interestingly, procedures influenced the information used by individuals when assessing the fairness of outcomes. When procedures were fair, the equitableness of outcomes influenced distributive justice ratings. When procedures were unfair, however, the equitableness of outcomes did not influence distributive justice judgements. Since many organizations use merit based compensation systems which incorporate outcome equity ideas, fair procedures may be necessary for the success of these pay strategies.
Conclusions

The current study has examined the cross over effects of procedural and distributive justice contributors. In contrast to past attempts to examine these questions, the current study has unconfounded the contributors to justice perceptions (inputs, outcomes and procedures), an issue which has been problematic in past research.

In general, past research has found strong evidence of a cross over effect for procedures; fair procedures have led to greater distributive justice perceptions. In contrast to past research, the current study found a much weaker and inconsistent cross over effect of procedures. The results of past research examining the effect of outcomes on procedural justice perceptions has been mixed. These studies, however, had not examined the effect of outcome fairness, but instead typically assumed outcome level to be equivalent to outcome fairness. In the present study, both outcomes and outcome fairness were found to have a cross over effect on procedural justice.
References


Table 1

Demographic Characteristics of Samples

<table>
<thead>
<tr>
<th>Gender</th>
<th>MAIN SAMPLE&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Academic Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>71.7%</td>
<td>Freshman 27.5%</td>
</tr>
<tr>
<td>Male</td>
<td>28.3%</td>
<td>Sophomore 40.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Junior 20.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Senior 10.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other 0.8%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>0.8%</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>22.5%</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>35.8%</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>22.5%</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>9.2%</td>
<td></td>
</tr>
<tr>
<td>22+</td>
<td>9.2%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Gender</th>
<th>PILOT SAMPLE&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Academic Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>54.0%</td>
<td>Freshman 49.2%</td>
</tr>
<tr>
<td>Male</td>
<td>46.0%</td>
<td>Sophomore 16.9%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Junior 21.8%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Senior 11.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Other 0.8%</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>0.8%</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>46.8%</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>15.3%</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>20.2%</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>12.1%</td>
<td></td>
</tr>
<tr>
<td>22+</td>
<td>4.8%</td>
<td></td>
</tr>
</tbody>
</table>

<sup>a</sup><sub>N=120</sub>.  <sup>b</sup><sub>N=123</sub>.
Table 2

**Factor Analysis of Justice Items**

<table>
<thead>
<tr>
<th>Scale Items</th>
<th>Factor 1: Procedural Justice</th>
<th>Factor 2: Distributive Justice</th>
</tr>
</thead>
<tbody>
<tr>
<td>PJ1</td>
<td>.67 *</td>
<td>-.01</td>
</tr>
<tr>
<td>PJ2</td>
<td>1.04 *</td>
<td>-.15</td>
</tr>
<tr>
<td>PJ3</td>
<td>.37 *</td>
<td>.31</td>
</tr>
<tr>
<td>PJ4</td>
<td>.92 *</td>
<td>-.01</td>
</tr>
<tr>
<td>DJ1</td>
<td>.21</td>
<td>.03 *</td>
</tr>
<tr>
<td>DJ2</td>
<td>-.17</td>
<td>.94 *</td>
</tr>
<tr>
<td>DJ3</td>
<td>.12</td>
<td>.79 *</td>
</tr>
</tbody>
</table>

**Note.** Underlined items were included in the procedural or distributive justice scales.

*Indicates the loading that should be the highest for each item.*
Table 3

**Factor Analysis of Satisfaction Items**

<table>
<thead>
<tr>
<th>Scale Items</th>
<th>Factor 1: Sat. with Exper.</th>
<th>Factor 2: Sat. with Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>SATEXP1</td>
<td>.91 *</td>
<td>-.02</td>
</tr>
<tr>
<td>SATEXP2</td>
<td>.42 *</td>
<td>-.08</td>
</tr>
<tr>
<td>SATEXP3</td>
<td>.85 *</td>
<td>.04</td>
</tr>
<tr>
<td>SATOUT1</td>
<td>.05</td>
<td>.86 *</td>
</tr>
<tr>
<td>SATOUT2</td>
<td>.01</td>
<td>.70 *</td>
</tr>
<tr>
<td>SATOUT3</td>
<td>-.05</td>
<td>.83 *</td>
</tr>
</tbody>
</table>

*Note. Underlined items were included in the satisfaction with experimenter or satisfaction with outcome scales. * Indicates the loading that should be the highest for each item.*
**Table 4**

**Within Cell Descriptive Statistics**

<table>
<thead>
<tr>
<th>High Outcome</th>
<th>Low Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Input</td>
<td>Low Input</td>
</tr>
<tr>
<td>mean(sd)</td>
<td>mean(sd)</td>
</tr>
<tr>
<td>PJ</td>
<td>4.53(0.61)</td>
</tr>
<tr>
<td>DJ</td>
<td>4.80(0.31)</td>
</tr>
<tr>
<td>SATEXP</td>
<td>4.57(0.50)</td>
</tr>
<tr>
<td>SATOUT</td>
<td>4.91(0.20)</td>
</tr>
<tr>
<td>SCORE</td>
<td>20.53(6.56)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unfair Procedure</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Outcome</td>
</tr>
<tr>
<td>mean(sd)</td>
</tr>
<tr>
<td>PJ</td>
</tr>
<tr>
<td>DJ</td>
</tr>
<tr>
<td>SATEXP</td>
</tr>
<tr>
<td>SATOUT</td>
</tr>
<tr>
<td>SCORE</td>
</tr>
</tbody>
</table>

**Note.** PJ = procedural justice; DJ = distributive justice; SATEXP = satisfaction with experimenter; SATOUT = satisfaction with outcome; SCORE = score on catalogue search task. N = 120.
Table 5

**Intercorrelations and Internal Consistencies for Measures**

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>PJ</td>
<td>(.91)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DJ</td>
<td></td>
<td>.63*</td>
<td>(.85)</td>
<td></td>
</tr>
<tr>
<td>SATEXP</td>
<td>.49*</td>
<td>.55*</td>
<td>(.92)</td>
<td></td>
</tr>
<tr>
<td>SATOUT</td>
<td>.54*</td>
<td>.79*</td>
<td>.49*</td>
<td>(.86)</td>
</tr>
<tr>
<td>SCORE</td>
<td>-.04</td>
<td>-.03</td>
<td>.10</td>
<td>-.06</td>
</tr>
</tbody>
</table>

**Note.** Coefficient alpha for each measure appears in parentheses. PJ = procedural justice; DJ = distributive justice; SATEXP = satisfaction with experimenter; SATOUT = satisfaction with outcome; SCORE = score on catalogue search task. N = 120.

* p < .001.
Table 6

Source Table for ANOVA Assessing Outcomes, Inputs, and Procedures on Distributive Justice

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Eta^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome</td>
<td>1</td>
<td>61.46</td>
<td>36.79**</td>
<td>.24</td>
</tr>
<tr>
<td>Input</td>
<td>1</td>
<td>0.16</td>
<td>0.10</td>
<td>.00</td>
</tr>
<tr>
<td>Procedure</td>
<td>1</td>
<td>0.88</td>
<td>0.53</td>
<td>.00</td>
</tr>
<tr>
<td>Outcome x Input</td>
<td>1</td>
<td>3.62</td>
<td>2.17</td>
<td>.01</td>
</tr>
<tr>
<td>Outcome x Procedure</td>
<td>1</td>
<td>0.23</td>
<td>0.14</td>
<td>.00</td>
</tr>
<tr>
<td>Input x Procedure</td>
<td>1</td>
<td>3.78</td>
<td>2.26</td>
<td>.01</td>
</tr>
<tr>
<td>Outcome x Input x</td>
<td>1</td>
<td>8.22</td>
<td>4.92*</td>
<td>.03</td>
</tr>
<tr>
<td>Procedure x Procedure</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within</td>
<td>107</td>
<td>1.67</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. N = 120.
*p < .05.  **p < .001.
Table 7

Source Table for ANOVA Assessing Outcomes and Inputs on Distributive Justice, Unfair Procedure Conditions Only

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Eta²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome</td>
<td>1</td>
<td>27.72</td>
<td>14.00*</td>
<td>.21</td>
</tr>
<tr>
<td>Input</td>
<td>1</td>
<td>2.79</td>
<td>1.41</td>
<td>.02</td>
</tr>
<tr>
<td>Outcome x Input</td>
<td>1</td>
<td>0.05</td>
<td>0.02</td>
<td>.00</td>
</tr>
<tr>
<td>Within</td>
<td>52</td>
<td>1.98</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. n = 56.  
*p < .001.
Table 8

Source Table for ANOVA Assessing Outcomes and Inputs on Distributive Justice, Fair Procedure Conditions Only

<table>
<thead>
<tr>
<th>Source</th>
<th>df</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Eta^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome</td>
<td>1</td>
<td>33.97</td>
<td>24.66**</td>
<td>.28</td>
</tr>
<tr>
<td>Input</td>
<td>1</td>
<td>1.15</td>
<td>0.84</td>
<td>.01</td>
</tr>
<tr>
<td>Outcome x Input</td>
<td>1</td>
<td>11.79</td>
<td>8.56*</td>
<td>.10</td>
</tr>
<tr>
<td>Within</td>
<td>55</td>
<td>1.98</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. n = 59.
*p < .01, **p < .001.
Table 9

**Regression Analysis Assessing Mediation of Procedural Justice on the Procedure and Distributive Justice Relationship**

---

**Step 1**

**Effects of Procedure on Procedural Justice**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure</td>
<td>.24</td>
<td>2.71*</td>
</tr>
</tbody>
</table>

\[ R^2 = .06^* \]

---

**Step 2**

**Effects of Procedure on Distributive Justice**

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure</td>
<td>.06</td>
<td>0.62</td>
</tr>
</tbody>
</table>

\[ R^2 = .00 \]

\[ ^aN = 119. \quad ^bN = 115. \]

\[ ^*p < .01. \]
Table 10
Regression Analysis Assessing Mediation of Procedural Justice on the Procedure and Distributive Justice Relationship, Low Input/Low Outcome Conditions Only

Step 1
Effects of Procedure on Procedural Justice\textsuperscript{a}

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$t$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure</td>
<td>0.01</td>
<td>0.05</td>
</tr>
</tbody>
</table>

$R^2 = .00$

Step 2
Effects of Procedure on Distributive Justice\textsuperscript{b}

<table>
<thead>
<tr>
<th>Variable</th>
<th>$B$</th>
<th>$t$ value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedure</td>
<td>-0.26</td>
<td>-1.36</td>
</tr>
</tbody>
</table>

$R^2 = .07$

\textsuperscript{a}$n = 29$. \textsuperscript{b}$n = 28$. 
Table 11

**Source Table for ANOVA Assessing Outcomes, Inputs, and Procedures on Procedural Justice**

<table>
<thead>
<tr>
<th></th>
<th>df</th>
<th>Mean Square</th>
<th>F Value</th>
<th>Eta²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome</td>
<td>1</td>
<td>9.57</td>
<td>6.18**</td>
<td>.05</td>
</tr>
<tr>
<td>Input</td>
<td>1</td>
<td>4.48</td>
<td>2.89</td>
<td>.02</td>
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<tr>
<td>Procedure</td>
<td>1</td>
<td>12.40</td>
<td>8.00***</td>
<td>.06</td>
</tr>
<tr>
<td>Outcome x Input</td>
<td>1</td>
<td>4.78</td>
<td>3.08*</td>
<td>.02</td>
</tr>
<tr>
<td>Outcome x Procedure</td>
<td>1</td>
<td>3.42</td>
<td>2.21</td>
<td>.02</td>
</tr>
<tr>
<td>Input x Procedure</td>
<td>1</td>
<td>0.15</td>
<td>0.10</td>
<td>.00</td>
</tr>
<tr>
<td>Outcome x Input x Procedure</td>
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<td>3.17</td>
<td>2.05</td>
<td>.02</td>
</tr>
<tr>
<td>Within</td>
<td>111</td>
<td>1.54</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.** N = 119.

*p < .08. **p < .05. ***p < .01.
Table 12

Regression Analysis Assessing Mediation of Distributive Justice on Outcome Fairness and Procedural Justice Relationship

---

**Step 1**
Effects of Outcome Fairness on Distributive Justice\(^a\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>t value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome Fairness</td>
<td>.12</td>
<td>1.33</td>
</tr>
</tbody>
</table>

\(R^2 = .02\)

---

**Step 2**
Effects of Outcome Fairness on Procedural Justice\(^b\)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>t value</th>
</tr>
</thead>
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\(R^2 = .02\)

\(^aN = 115. \quad bN = 119.\)
Table 13

Regression Analysis Assessing Mediation of Distributive Justice on Outcome Fairness and Procedural Justice Relationship, Fair Procedure Conditions Only

---

**Step 1**
Effects of Outcome Fairness on Distributive Justice\(^a\)

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\(R^2 =.10**\)

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**Step 2**
Effects of Outcome Fairness on Procedural Justice\(^b\)

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\(R^2 =.09*\)

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**Step 3**
Effects of Distributive Justice on Procedural Justice\(^a\)

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\(R^2 =.61***\)

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**Step 4**
Effects of Outcome Fairness and Distributive Justice on Procedural Justice\(^a\)

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\(R^2 =.61***\)

\(^a\) n = 59.  \(^b\) n = 60.

*p < .05.  **p < .01.  ***p < .001.
Table 14

**Regression Analysis Assessing Mediation of Distributive Justice on Outcome Level and Procedural Justice Relationship, Unfair Procedure Conditions Only**

---

**Step 1**

**Effects of Outcome on Distributive Justice**

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\[ R^2 = .21* \]

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**Step 2**

**Effects of Outcome on Procedural Justice**

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\[ R^2 = .00 \]

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\( n = 56. \quad \)\( n = 59. \)

*\( p < .001. \)
Figure 1: Bonus Payment Ratings, One through Ten Dollars.
Figure 2: Outcome by Input Interaction on Distributive Justice, Fair Procedure Conditions Only.
Figure 3: Procedure by Input Interaction on Distributive Justice, Low Outcome Conditions Only.
Figure 4: Outcome by Input Interaction on Procedural Justice.
## Appendix A
### Catalogue Search Task

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## Appendix B

### Catalogue Search Task Answer Key

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Appendix C

Catalogue Search Task Performance Feedback Chart

Low Performance (15th Percentile)
Task Score = 22

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146
## High Performance (85th Percentile)

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<tr>
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<td>99</td>
</tr>
</tbody>
</table>
Appendix D
Last Name Lottery Protocol

If the subjects last name begins with the letters A-H...

and the subject is in the high outcome condition, use
the letters A-H.

and the subject is in the low outcome condition, use
the letters I-P.

If the subjects last name begins with the letters I-P...

and the subject is in the high outcome condition, use
the letters I-P.

and the subject is in the low outcome condition, use
the letters Q-Z.

If the subjects last name begins with the letters Q-Z...

and the subject is in the high outcome condition, use
the letters Q-Z.

and the subject is in the low outcome condition, use
the letters A-H.
Appendix E
Procedure Scenarios - Pilot Study

Fair Procedure

When you report to the experiment, you are told that the purpose of the experiment is to see how well people are able to use different kinds of catalogues. In exchange for performing the catalogue searching task for 30 minutes, you will receive one extra credit point and a possible $4 bonus. The experimenter demonstrates the task, gives you the materials, and asks you to perform the task quickly and accurately. You perform the catalogue searching task for 30 minutes. The experimenter asks you to stop and record how many products you found in the catalogue. The experimenter tells you how well you performed compared with other subjects.

The experimenter now tells you how the bonus money decision will be made, which determines whether or not you will receive the $4 bonus. The experimenter says, "We intended to give the $4 bonus to everyone who performed in the top 50 percent, or above the mean. That way the subjects who did the best on the catalogue task would be rewarded. Unfortunately, we don’t have enough grant money and we are going to distribute the money through a lottery system. All subjects will have at least a small chance to win the lottery, however, higher performing subjects will
have a higher chance of winning. Subjects who performed in the top 25 percent will have 6 in 10 chances to win, subjects who performed between the 50th and 74th percentile will have 4 in 10 chances to win, subjects who performed between the 25th and 49th percentile will have 2 in 10 chances to win, and subjects who performed in the bottom 25 percent will have 1 in 10 chances to win.

The experimenter then reminds you what percentile you performed in (how well you performed compared to other subjects) and how many chances you will get to win. The appropriate number of winning and losing lottery slips are placed in a box, and one is drawn to determine whether or not you win the $4 bonus.
Unfair Procedure

When you report to the experiment, you are told that the purpose of the experiment is to see how well people are able to use different kinds of catalogues. In exchange for performing the catalogue searching task for 30 minutes, you will receive one extra credit point and a possible $4 bonus. The experimenter demonstrates the task, gives you the materials, and asks you to perform the task quickly and accurately. You perform the catalogue searching task for 30 minutes. The experimenter asks you to stop and record how many products you found in the catalogue. The experimenter tells you how well you performed compared with other subjects.

The experimenter now tells you how the bonus money decision will be made, which determines whether or not you will receive the $4 bonus. The experimenter says, "What we would like to do is give the bonus money to all subjects who performed well. That way the subjects who did the best on the catalogue task would be rewarded. When we ran this study last spring we gave the $4 bonus to everyone who performed in the top 50 percent, or above the mean. We don't have enough grant money this semester, however, so we are going to distribute the money through a type of lottery system. I'm going to give the $4 bonus to everyone who's last name starts with any of the letters A through F."
If your last name starts with one of the letters A through F you would be given the $4 bonus. If your last name starts with any other letters, you would not receive any bonus money.
Appendix F
Monetary Psychological Value - Pilot Study

Suppose you are participating in a one hour experiment where you will receive one extra credit point and a possible bonus of money.

1. How concerned would you be with the outcome of the bonus decision if the bonus was one dollar?

   1  2  3  4  5  6  7  8  9
   Not At All  Moderately  Extremely

2. How concerned would you be with the outcome of the bonus decision if the bonus was two dollars?

   1  2  3  4  5  6  7  8  9
   Not At All  Moderately  Extremely

3. How concerned would you be with the outcome of the bonus decision if the bonus was three dollars?

   1  2  3  4  5  6  7  8  9
   Not At All  Moderately  Extremely

4. How concerned would you be with the outcome of the bonus decision if the bonus was four dollars?

   1  2  3  4  5  6  7  8  9
   Not At All  Moderately  Extremely

5. How concerned would you be with the outcome of the bonus decision if the bonus was five dollars?

   1  2  3  4  5  6  7  8  9
   Not At All  Moderately  Extremely
6. How concerned would you be with the outcome of the bonus decision if the bonus was six dollars?

<table>
<thead>
<tr>
<th>Not At All</th>
<th>Moderately</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
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</tbody>
</table>

7. How concerned would you be with the outcome of the bonus decision if the bonus was seven dollars?

<table>
<thead>
<tr>
<th>Not At All</th>
<th>Moderately</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
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</table>

8. How concerned would you be with the outcome of the bonus decision if the bonus was eight dollars?

<table>
<thead>
<tr>
<th>Not At All</th>
<th>Moderately</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. How concerned would you be with the outcome of the bonus decision if the bonus was nine dollars?

<table>
<thead>
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<th>Not At All</th>
<th>Moderately</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. How concerned would you be with the outcome of the bonus decision if the bonus was ten dollars?

<table>
<thead>
<tr>
<th>Not At All</th>
<th>Moderately</th>
<th>Extremely</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9</td>
<td></td>
<td></td>
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</tbody>
</table>
Appendix G
Procedural Justice

1. In terms of just the procedures the experimenter used to determine whether you should receive the bonus, to what extent were you treated the way you deserved to be treated?
   1. not at all
   2. slightly
   3. moderately
   4. for the most part
   5. completely

2. In your opinion, how fair were the practices the experimenter followed in reaching a decision about the bonus?
   1. not at all fair
   2. slightly fair
   3. moderately fair
   4. for the most part fair
   5. completely fair

3. How fairly were you treated by the experimenter?
   1. not at all
   2. slightly
   3. moderately
   4. for the most part
   5. completely

4. How fair were the procedures which were used to make the bonus decision?
   1. not at all fair
   2. slightly fair
   3. moderately fair
   4. for the most part fair
   5. completely fair
Appendix H
Distributive Justice

1. To what extent was your bonus payment related to your performance on the catalogue searching task?
   1. not at all related
   2. slightly related
   3. moderately related
   4. for the most part related
   5. completely related

2. To what extent did your bonus payment give you the full amount you deserved?
   1. not at all
   2. slightly
   3. moderately
   4. for the most part
   5. completely

3. How fair do you consider your bonus payment to be?
   1. not at all fair
   2. slightly fair
   3. moderately fair
   4. for the most part fair
   5. completely fair
Appendix I
Satisfaction with Outcomes

1. All in all, I am satisfied with my bonus payment in this experiment.
   1. don’t agree at all
   2. slightly agree
   3. moderately agree
   4. agree for the most part
   5. completely agree

2. In general, I am unhappy with my bonus payment in this experiment.
   1. don’t agree at all
   2. slightly agree
   3. moderately agree
   4. agree for the most part
   5. completely agree

3. In this experiment, I think the overall amount of my bonus payment is good.
   1. don’t agree at all
   2. slightly agree
   3. moderately agree
   4. agree for the most part
   5. completely agree
Appendix J
Satisfaction with Experimenter

1. All in all, I am satisfied with the experimenter in this experiment.
   1. don't agree at all
   2. slightly agree
   3. moderately agree
   4. agree for the most part
   5. completely agree

2. In general, I am unhappy with the experimenter in this experiment.
   1. don't agree at all
   2. slightly agree
   3. moderately agree
   4. agree for the most part
   5. completely agree

3. I think this person was a good experimenter.
   1. don't agree at all
   2. slightly agree
   3. moderately agree
   4. agree for the most part
   5. completely agree
Appendix K
Manipulation Checks

1. How well did you perform the task compared with other subjects?
   1. worse than most
   2. about average
   3. better than most

2. Did you receive the bonus?
   1. yes
   2. no

3. What was the probability that you would have received the bonus?
   ________
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EDUCATION

1991 - 1994  Ph.D. Industrial/Organizational Psychology
VIRGINIA POLYTECHNIC INSTITUTE AND STATE
UNIVERSITY
Blacksburg, Virginia

1989 - 1991  M.S. Industrial/Organizational Psychology
VIRGINIA POLYTECHNIC INSTITUTE AND STATE
UNIVERSITY
Blacksburg, Virginia

1984 - 1988  B.A. Psychology
UNIVERSITY OF ROCHESTER
Rochester, New York

PROFESSIONAL AND RESEARCH EXPERIENCE

8/93 - present  Wytheville Community College, Instruction and Student
Services, Wytheville, VA
Assessment and Research Intern
- Review all assessment survey procedures. Implement changes
to improve collection, analysis and reporting of data.
- Review all surveys and make recommendations for
improvements in content and format.
- Assist in the development of evaluation measures for
instructional and non-instructional areas of the college.

11/93 - 12/93  Neil M. A. Hauenstein, Blacksburg, VA
Consultant
- Planned, conducted, interpreted, and documented selection
system validation analyses for life insurance company.
5/92 - 8/92 Allstate Research and Planning Center, Human Resources Research, Menlo Park, CA
Industrial/Organizational Psychology Intern
- Planned, conducted, interpreted, and documented strategic analyses of employee opinion survey.

12/91 - 1/92 Bell Atlantic, Selection Research, Arlington, VA
Selection Test Administrator
- Administered computerized selection battery for concurrent validation study.

1/90 - 4/91 Neil M. A. Hauenstein, Blacksburg, VA
Consulting Assistant
- Assisted in development of performance appraisal system and compensation package for life insurance company.
- Assisted in development of merit pay system for hospital employees, including establishing pay structure, performance appraisal system, and feedback system.

6/87 - 5/88 University of Rochester, Center for Community Study, Rochester, NY
Research Assistant
- Coded and analyzed data using SAS.

Program Assistant
- Performed orientation and immigration counseling.
- Maintained computerized data base and produced reports.

6/87 - 8/87 Sudden Infant Death Center of Western New York, Rochester, NY
Researcher
- Surveyed local mental health providers to determine relevant available services. Collected, coded, and analyzed data, and produced written report.

6/86 - 5/87 University of Rochester, Department of Psychology, Rochester, NY
Research Assistant
- Coded facial expressions for human development study.

9/86 - 12/86 University of Rochester, Mount Hope Family Treatment Center, Rochester NY
Research Assistant
- Performed video data collection for child abuse study.
- Transcribed video and audio data.
TEACHING EXPERIENCE

Instructor, Virginia Polytechnic Institute and State University

8/92 - 5/93 Research Methods in Psychology
12/91 - 5/92 Psychology Motivation Laboratory
8/91 - 12/91 Psychological Measurement Laboratory
8/89 - 12/89 Introductory Psychology Discussion Group

TECHNICAL REPORTS


PRESENTATIONS AT PROFESSIONAL MEETINGS


RELEVANT COURSE WORK

Content Courses:
Industrial Psychology (I & II)
Organizational Psychology I (Motivation)
Organizational Psychology II (Leadership & Organizational Theory)
Decision Making
Wage and Incentive Systems
Social Psychology
Psychology of Learning

Research Methods and Statistics:
Research Methods
Quantitative Methods in Industrial/Organizational Psychology
Statistics for Social Science Research (I & II)
Regression
Multivariate Statistics
Psychometric Theory
PROFESSIONAL MEMBERSHIP

American Psychological Association
Society for Industrial and Organizational Psychology
Association for Institutional Research

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