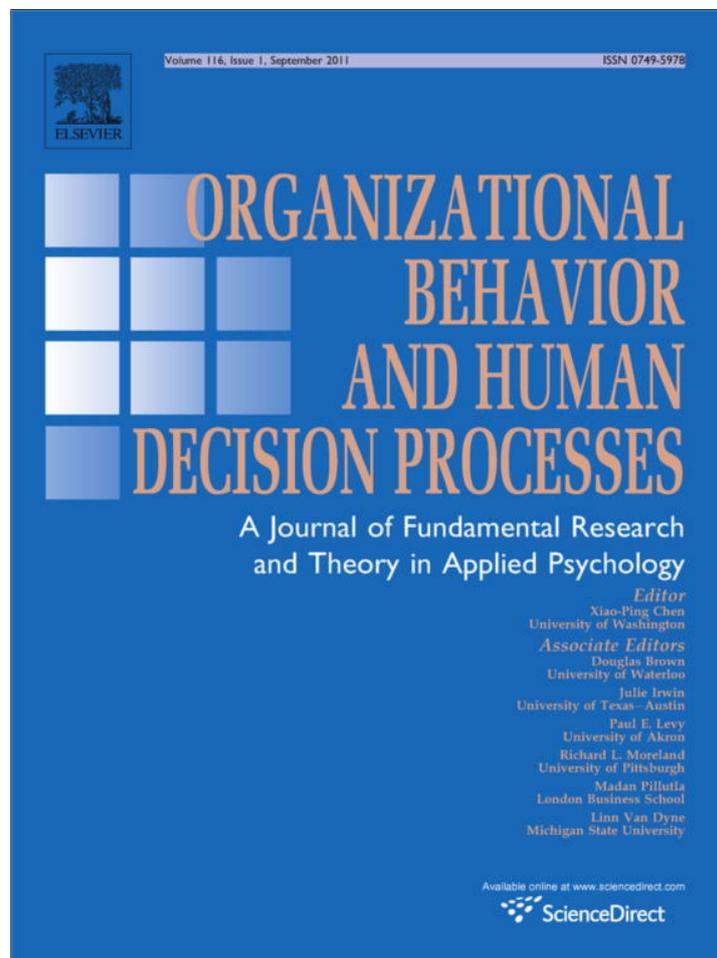


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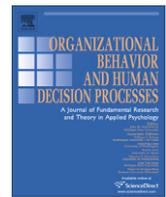
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When fairness neither satisfies nor motivates: The role of risk aversion and uncertainty reduction in attenuating and reversing the fair process effect

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ABSTRACT

It is widely acknowledged that procedural justice has many positive effects. However, some evidence suggests that procedural justice may not always have positive effects and may even have negative effects. We present three studies that vary in method and participant populations, including an archival study, a field study, and an experiment, using data provided by the general American population, Indian software engineers, and undergraduate students in the US. We demonstrate that key work-related variables such as people's job satisfaction and performance depend on procedural justice, perceived uncertainty, and risk aversion such that risk seeking people react less positively and at times negatively to the same fair procedures that appeal to risk averse people. Our results suggest that one possible reason for these effects is that being treated fairly reduces people's perception of uncertainty in the environment and while risk averse people find low uncertainty desirable and react positively to it, risk seeking people do not. We discuss the implications of our findings for theories of procedural justice including the uncertainty management model of fairness, the fair process effect, and fairness heuristic theory.

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Introduction

That procedural justice is an important and desirable element in organizational settings is rarely questioned. This widespread assumption is not surprising given the number of studies that have shown procedural justice having positive effects on people's attitudes and behaviors in the workplace, and in society in general (e.g., Greenberg, Roberge, Ho, & Rousseau, 2004; Masterson, Lewis, Goldman, & Taylor, 2000; McFarlin & Sweeney, 1992; Moorman, 1991; Mowday, Porter, & Steers, 1982; See, 2009; Tyler & Lind, 1992). The notion that perceptions of procedural justice might lead employees to engage in positive organizational behavior is reasonable given that fair procedures meet prevailing moral standards (Folger, 1998, 2001; Folger, Cropanzano, & Goldman, 2005; Montada, 2003) and lead employees to infer that they are respected members of the organization (De Cremer & Tyler, 2005; Lind & Tyler, 1988), to identify strongly with their organizations (Tyler & Blader, 2000), to perceive that they have some measure of control in resource allocation decisions (Thibaut & Walker, 1975), and to feel confident of not being exploited by organizational authorities (Lind & Van den Bos, 2002). On these grounds one might expect that all employees would want to be

dealt with fairly, and that they would engage in more positive organizational behavior if they perceived they were being treated more fairly.

While the moral imperative and status-enhancing characteristics of procedural fairness are well-established and demonstrated to be valuable to individuals in organizational contexts (for a review, see Greenberg & Colquitt, 2005), there is some evidence, however, that suggests that fairness sometimes does not have positive effects and may even have negative effects (see Brockner, Wiesenfeld, & Diekmann, 2009 for a review). In this paper, we further explore the conditions under which procedural fairness may sometimes have a less than positive and at times negative influence on individuals' job-related attitudes such as job satisfaction and performance. In particular, we develop a theoretical framework identifying one possible moderator, namely the degree to which people are risk averse or risk seeking, that helps explain when procedural fairness may have a negative influence. We empirically examine why risk aversion matters, focusing on the uncertainty reducing effect of procedural fairness. We show that this reduction in uncertainty does indeed occur and that it can explain why risk averse individuals respond positively to procedural fairness and why risk seeking individuals do not.

This paper therefore makes three important contributions to our understanding of organizational justice and the development of organizational justice theories: we demonstrate that (1) whereas risk averse people respond positively to being treated

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fairly, risk seeking people may react negatively, (2) being treated fairly reduces people's perception of uncertainty in the environment, and (3) the moderating effect of risk aversion is in part because of the uncertainty reducing effect of procedural justice. We discuss how our findings provide persuasive empirical support for a major claim of the uncertainty management theory of fairness—that being treated fairly reduces perceptions of uncertainty. We also provide evidence for a “reversal effect” or negative relationship between fairness and job-related attitudes and performance, a result which Brockner (2010) identifies as “the most intriguing pattern of all” fairness outcomes and “most noteworthy on both conceptual and practical grounds” (p. 132). Like Brockner, we argue that given its significance, this reversal effect should be examined more closely to identify when it is likely to occur.

We proceed by first examining existing evidence of the limits of procedural justice and review studies that have documented that high procedural justice may at times not have any effect or may even have a negative effect. We then review the relevant literature on uncertainty, risk aversion, and procedural fairness. Next, we develop a theoretical argument that explains likely reactions to fairness (and the consequent reduction in perceived uncertainty) by individuals with different levels of risk aversion. We report three empirical studies that examine our predictions. Finally, we discuss the implications of our results for researchers and managers.

Existing evidence of the limits of procedural justice

Attenuation of the positive effects of procedural justice

Procedural justice does not always lead to favorable attitudes and behaviors. Drawing on self-verification theory, Wiesenfeld, Swann, Brockner, and Bartel (2007), for example, found being treated in a fair manner had no effect on organizational commitment for people with low self-esteem. Similarly, Brockner, De Cremer, Van den Bos, and Chen (2005) found that procedural fairness had a positive effect on cooperation, affect, and desire for future interaction for people with high interdependent self-construal, but no significant effect for people with low interdependent self-construal. Similarly, while Brockner, Tyler, and Cooper-Schneider (1992) found a strong effect for procedural fairness on organizational commitment for organizational members who had strong prior commitment, they found no effect for those who had weak prior commitment.

Reversal of the positive effects of procedural justice

There is also some evidence of a reversal effect whereby in certain situations or with certain types of people, procedural fairness may even have negative effects on attitudes, beliefs, and preferences. Van den Bos, Bruins, Wilke, and Dronkert (1999) argued that when people receive an unfavorable outcome, they search for causes that explain why they received such an outcome. Whereas unfair procedures provide people an opportunity to attribute their unfavorable outcomes to external causes, fair procedures do not. As a consequence, in strongly self-evaluative contexts, when people receive unfavorable outcomes, they react more negatively to fair procedures than to unfair procedures—a reversal of the fair process effect. Consistent with this explanation, Schroth and Shah (2000) demonstrated that fair procedures result in higher self-esteem ratings than unfair procedures only if outcomes are positive; if outcomes are negative, fair procedures lead to lower self-esteem. Brockner, De Cremer, Fishman, and Spiegel (2008) found a similar reversal effect on self evaluations in response to unfavorable outcomes for people with more of a prevention focus.

In another recent study, Barry and Tyler (2009) found that group members who were highly identified with their group were more motivated to help their group when the group's procedures were unfair rather than fair.

Beyond attitudes toward and preferences among procedures, there is also evidence that the fairness of procedures may have no effect or even a negative effect for task performance. Earley and Lind (1987) studied the relationship between procedural justice and performance wherein they manipulated procedural justice by allowing some workers to control how tasks were assigned. They found that procedural justice did not enhance performance. Kanfer, Sawyer, Earley, and Lind (1987) manipulated voice in a performance appraisal process and documented a negative relationship between procedural justice and performance. Moreover, Colquitt, Conlon, Wesson, Porter, and Ng's (2001) meta-analysis suggests that there is a considerable amount of variation in the relationship between justice and performance (Colquitt et al., 2001), and Kanfer et al. (1987) cautioned that “it is naive to assume that increases in procedural fairness always lead to increases in performance” (p. 245).

Previous research, therefore, has demonstrated a general but not universal pattern of positive results of procedural justice on attitudes, behaviors, and performance. Consistent with a focus on moral, relational and status concerns, explanations for attenuation and reversal effects have tended to rely on situations where self-evaluations are at stake. Might there be other concerns and individual differences, however, that account for varied reactions to procedural justice? As an alternative to concerns over self-evaluation, Colquitt, Scott, Judge, and Shaw (2006) proposed that risk aversion would matter.

Risk aversion, uncertainty, and procedural justice

Risk aversion

The concept of risk aversion has its origins in the field of microeconomics and suggests that variance in possible outcomes tends to be avoided (Arrow, 1971; March, 1996). While many psychologists and virtually all previous empirical research on the psychology of procedural justice consider uncertainty to be universally disliked by people, economists have long considered risk aversion to be a variable that is widely distributed across the population so that some people are risk averse while others are risk seeking (for a review, see Halek & Eisenhauer, 2001). To take one financial example, based on their actuarial risks, some people purchase too little insurance and others too much.

There is also an abundance of research in the management literature that shows that risk aversion matters for individual and organizational outcomes. For instance, research on pay incentives and employee performance has shown that unlike risk averse employees, those with a high willingness to take risks are more likely to engage in organizational activities and perform well if they work for a firm utilizing variable compensation wherein the final salary amount is uncertain (Gomez-Mejia & Balkin, 1989). Similarly, Maehr and Videbeck (1968) have demonstrated that risk and uncertainty actually may be psychologically appealing to individuals who make risky choices and that such people can be expected to respond to variable incentives differently from those who are risk averse. Nor is risk aversion only associated with economic or financial decision-making; Johanson (2000), for example, demonstrated that risk aversion also captures attitudes toward non-financial risk and is correlated with intolerance of ambiguity, that is, an individual's tendency to view an ambiguous or uncertain situation as a source of discomfort, or possibly, even as a threat (Budner, 1962). Examples of personal risk seeking

behaviors include gambling, smoking tobacco, driving while using a cellular phone, engaging in extreme sports, and practicing unsafe sex.

Risk aversion and procedural justice

Colquitt et al. (2006) report an interaction between risk aversion and procedural justice such that high risk averse individuals reacted more strongly to high fairness than low risk averse individuals; the former increased their performance and reduced their engagement in counterproductive behavior while the latter did not. Colquitt et al. (2006) suggested that the presence of uncertainty causes high risk averse individuals to pay more attention to fairness-related information because they are more anxious about uncertainty, and fairness can help individuals manage that uncertainty. However, Colquitt et al. (2006) neither varied nor measured uncertainty nor tested how attending to fairness-related information influences reactions to uncertainty. To help clarify the role risk aversion plays in reactions to procedural justice, we believe it is important to focus our theoretical arguments and empirical investigation on *risk seeking* individuals as well as *risk averse* individuals. By doing so, we suggest that risk-seekers may not only react less strongly as suggested by Colquitt et al. (2006), but also, at times, may even react negatively to fair procedures compared to risk averse individuals.

We examine the moderating effect of risk aversion on the fair process effect across an archival dataset, a field study, and an experiment with different sample populations, and we develop a theoretical argument for *why* risk aversion matters. Specifically, we argue that being treated fairly reduces perceptions of uncertainty, and whereas risk averse people respond positively to this reduction in uncertainty, risk seeking people do not. Thus we expect that uncertainty mediates the relationship between procedural justice and attitudes and behaviors, and that the relationship between uncertainty and these outcomes in turn depends on risk aversion, as shown in Fig. 1.

Uncertainty and risk aversion

Fairness heuristic theory (Lind, 2001; Van den Bos, 2001) and uncertainty management theory (Lind & Van den Bos, 2002; Van den Bos & Lind, 2002) can help us understand why risk aversion may influence reactions to procedural justice in the manner we predict. Fairness heuristic theory suggests that employees are in a persistent state of uncertainty as to whether they should trust organizational authorities. To help cope with this uncertainty, employees use fairness perceptions, which are based on observable events such as whether procedures are consistent, accurate and

correctible (Leventhal, 1980) as substitutes for trustworthiness. Therefore, fair treatment is hypothesized to be valued not only in itself because it conveys respect but also because it mitigates employees' uncertainty about authorities (De Cremer et al., 2010). Uncertainty management theory addresses more general forms of uncertainty and emphasizes the prevalence of uncertainty in organizational life. This uncertainty acts as a stimulus for seeking fairness-related information (Lind & Van den Bos, 2002; Van den Bos & Lind, 2002) and fair treatment can ameliorate not only trust-related uncertainty but also can help people manage uncertainty in general (De Cremer & Sedikides, 2008; Van den Bos & Miedema, 2000; Van den Bos, Wilke, Lind, & Vermunt, 1998).¹

Van den Bos and Lind (2002) recommended that future researchers should examine the reasons how fairness is useful in managing uncertainty and suggested that fairness can increase the perceived predictability of future outcomes and thereby reduce uncertainty. Decreases in the perceived uncertainty in a situation, however, may lead to various reactions, depending on people's risk aversion; some people find risk or uncertainty debilitating and choose to avoid it whereas others find it exciting and are stimulated by it (Arrow, 1971; Cable & Judge, 1994; Maehar & Videbeck, 1968; March, 1996; Sitkin & Pablo, 1992; Sorrentino & Roney, 2000).

Potential negative effects of uncertainty reduction

The possibility of a negative relationship between fairness and performance for low risk averse individuals (i.e., risk seeking individuals) warrants further examination. While the interactive relationship between fairness, risk aversion, and performance has been previously examined (Colquitt et al., 2006), previous research cannot account for why people low in risk aversion (i.e., those who are relatively risk seeking) might respond *negatively* to fair treatment, revealing a reversal effect. We agree that procedural justice has a uniformly direct positive effect on work related outcomes because of the high regard and moral standards communicated by fair treatment (Brockner & Wiesenfeld, 1996; De Cremer & Sedikides, 2008; De Cremer & Tyler, 2005; Folger & Cropanzano, 1998; Montada, 2003; Thibaut & Walker, 1975; Tyler & Lind, 1992). However, we suggest that procedural justice may also have an indirect effect by reducing the uncertainty perceived in the environment. Because of this lowered level of perceived uncertainty, risk averse and risk seeking individuals will react differently to fair procedures. Specifically, we expect that whereas procedural justice will have a positive, indirect effect for risk averse people, it will have a negative, indirect effect for risk seeking people. We expect that the overall effect of procedural justice on work-related outcomes and attitudes such as performance and job satisfaction will be a sum total of its indirect and direct effects – the former that depend on perceived uncertainty and risk aversion and the latter that do not.

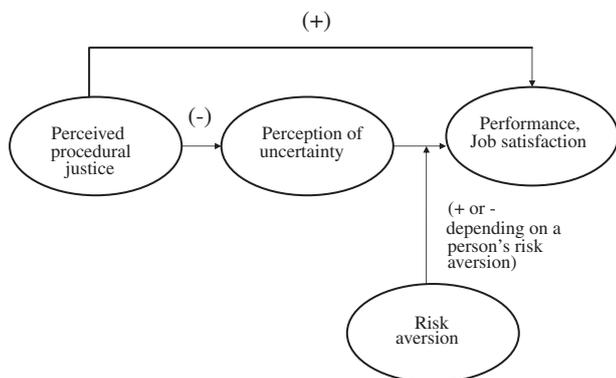
Summarizing these arguments, we formally predict:

Hypothesis 1. Risk aversion will moderate the relationship between procedural justice and work-related outcomes.

Hypothesis 2. The experience of procedural justice will reduce the uncertainty perceived in the environment.

¹ Note that unlike behavioral decision researchers who distinguish between risk and ambiguity, Lind and van den Bos' (2002) definition of uncertainty included both. In other words, it does not matter whether a decision maker is aware of the underlying probability distribution function of a future event; so long as the occurrence of the event is not definite, it contributes to uncertainty in the individual's judgment and decision making.

Fig. 1. Predicted effects of procedural justice, perceived uncertainty, and risk aversion on performance and job satisfaction.



Hypothesis 3. The relationship between procedural justice and work-related outcomes will be mediated by perceptions of reduced uncertainty, and an individual's risk aversion will moderate this mediated relationship.

Thus, we expect that procedural justice and risk aversion will jointly determine individuals' responses. Specifically, we predict that to the extent that procedural justice lowers subjective assessments of uncertainty and to the extent that this indirect effect outweighs the direct effect, in the presence of uncertainty, risk seeking people will respond negatively and have lower performance when procedural justice is high than when it is low, whereas risk averse people will respond positively and have higher performance when procedural justice is high than when it is low.

The next sections of this paper present three studies that empirically test our hypotheses. First, we present a study in which we analyze archival data with a general US population to examine Hypothesis 1, namely that risk aversion will moderate the fair process effect such that risk averse individuals will react positively and risk seeking individuals will react negatively to procedural fairness. Next, we present results from two studies (a field study with workers in India and a laboratory experiment with US undergraduate students) in which we assess how risk aversion moderates the fair process effect on performance, and test the hypothesized underlying mechanism namely, the uncertainty reduction brought about by fair treatment.

Study 1

We begin our empirical investigation by examining whether risk aversion moderates the relationship between procedural justice and job satisfaction (Hypothesis 1).

Method

Data and respondents

Data were drawn from the General Social Survey (GSS). The GSS is the US national probability survey of non-institutionalized adults, administered most years since 1972 by the National Opinion Research Center and available through the Interuniversity Consortium of Political and Social Research (Davis & Smith, 2006). We included data for the years 2002 and 2006, the 2 years that included survey items related to our independent and dependent variables. One of the advantages of using this particular dataset is that it included meaningful measures of risk aversion in two domains (sexual and financial).

Outcome variable: Job satisfaction

Job satisfaction was measured by taking the average of two items asking respondents to rate their job satisfaction in general on a four point scale (1 = very satisfied to 4 = not at all satisfied). We reverse coded these items so that a higher score reflected more job satisfaction.²

Predictor variables: Perceived procedural justice

Perceived procedural justice was measured with five items that were reverse coded and averaged to yield a procedural justice scale score (Cronbach's $\alpha = .69$). The items were, "Promotions are handled in a fair manner," "I have a lot of say about what happens on my job," "I often get to take part on decisions," "I have a lot of freedom to decide how to do my job," and "I often set the way things are done in my job." Responses to these items ranged from 1 = very true to 4 = not at all true.

Risk aversion

Risk aversion was operationalized as an index based on respondents' financial investments in the previous 12 months as well as their response to the question whether or not they had used a condom in the past 12 months during a sexual encounter with someone with whom they were not in a relationship. Risky sexual behavior has been viewed as a part of a larger constellation of risk-taking personality traits (see, for example, Adlaf & Smart, 1983; Anderson & Galinsky, 2006; Duncan, Strycker, & Duncan, 1999; Kingree & Betz, 2003; Kingree, Braithwaite, & Woodring, 2000; MacDonald, Fong, Zanna, & Martineau, 2000) and as such, the absence or presence of condom use during engagement in a sexual encounter with someone with whom one was not in a relationship is an indicator of risk aversion. In GSS 2002 and 2006, respondents were asked to indicate if they had engaged in sex with someone with whom they were not in a relationship and whether they had used a condom. In addition to sexual risk seeking, we also examined financial risk seeking behavior operationalized as whether the respondent had invested money in mutual funds or stocks in the past 12 months (Laffont, 1989) because such behavior is a different aspect of risk propensity than condom use (Adlaf & Smart, 1983). Based on the recommendation of an anonymous reviewer, we computed an index of risk aversion as the product of sexual and financial risk propensities.

The combined GSS 2002 and 2006 included 63 respondents who reported having sex with someone with whom they were not in a relationship and for whom data for all variables of interest, including financial risk aversion, were available.

Control variables

We included participants' age, sex, income, and job tenure in the analyses to control for potential demographic effects that have been shown to be associated with job satisfaction (Brockner & Adsit, 1986; Riordan & Shore, 1997; Tsui, Egan, & O'Reilly, 1992; Turban & Jones, 1988).

Results and discussion

Table 1 provides the means, standard deviations, and intercorrelations among the key variables. To test our prediction that risk aversion moderates the relationship between procedural justice and job satisfaction, we conducted a hierarchical, moderated regression analysis on job satisfaction, entering the predictor variables in the following order: (i) control variables – age, sex, income, and job tenure; (ii) independent variables – procedural justice and risk aversion; and (iii) their two-way interaction term. Prior to the analyses, all continuous measures were mean-centered (Aiken & West, 1991). The results of the regression are provided in Table 2. As predicted, the 2-way interaction of procedural justice and risk aversion on job satisfaction was significant ($\beta = -.32, p < .05$). To illustrate the nature of the 2-way interaction, we exhibit in Fig. 2 the predicted values of the dependent variable at one standard deviation above and one standard deviation below the means for the independent variables (Aiken & West, 1991). Unlike risk averse people, whose job satisfaction increased with increasing procedural justice (simple slope = .69, $p < .01$), for risk seeking people, job satisfaction decreased with procedural justice (simple slope = $-.28, p < .05$), thereby demonstrating a reversal of the fair process effect.

These results were obtained from people in a wide variety of organizations and jobs, for a non-job related, behavioral measure of risk aversion. The use of only two items in the job satisfaction measure is a limitation of this study, but the GSS does not include additional items. The results are also subject to the shortcomings commonly associated with small sample size and the correlations between key variables may have been inflated due to the study's

² All scale items used across the studies were averaged to form the particular scale.

Table 1
Summary statistics, correlations, and scale reliabilities^a (Study 1).

	Mean	SD	1	2	3	4	5	6	7
1. Age	36.92	14.53	–						
2. Sex	0.67	0.48	0.20 [†]	–					
3. Job tenure	4.54	4.97	0.44***	0.06	–				
4. Income	11.44	11.45	–0.04	–0.12	–0.05	–			
5. Procedural justice	3.20	0.71	–0.09	–0.28*	0.00	–0.06	(0.69)		
6. Risk aversion	0.10	0.38	0.07	0.12 [†]	0.18 [†]	0.00	0.15**	(0.68)	
7. Job satisfaction	2.70	0.67	0.03	0.01	0.06	–0.39**	0.51***	0.18 [†]	–

Note. All tests of variables are two-tailed (N = 63).

^a Scale reliabilities (Cronbach's alpha) in parenthesis.

[†] p ≤ .10.

* p ≤ .05.

** p ≤ .01.

*** p ≤ .001.

Table 2
Summary of hierarchical regression analysis of variables predicting job satisfaction^a (Study 1).

	Step 1	Step 2	Step 3
<i>Control variables</i>			
Age	0.01	0.04	0.04
Sex	–0.04	0.09	0.05
Job tenure	0.04	0.00	0.01
Income	–0.39**	–0.35**	–0.35**
<i>Main effects</i>			
Procedural justice		0.51***	0.20***
Risk aversion		0.09	0.25*
<i>Two-way interaction</i>			
Risk aversion × procedural justice			–0.32*
Model F	2.69*	6.63***	7.10***
R ²	0.16	0.42	0.48
ΔR ²		0.26	0.06
Adjusted R ²	0.10	0.35	0.41

Note. All tests of variables are two-tailed (N = 63).

^a Beta coefficients are standardized.

[†] p ≤ .10.

* p ≤ .05.

** p ≤ .01.

*** p ≤ .001.

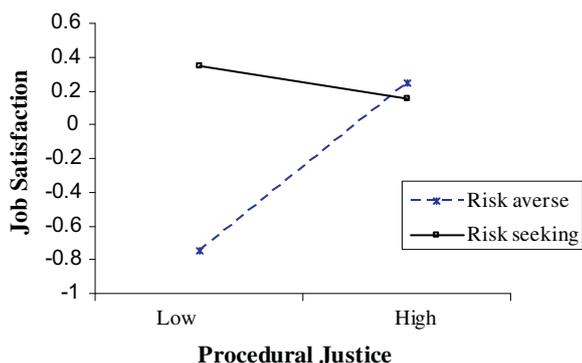


Fig. 2. Two-way interaction between procedural justice and risk aversion (Study 1).

reliance on self reported data. Nonetheless, while these results must be cautiously interpreted, they offer support for Hypothesis 1 by showing that risk averse and risk seeking people respond differently to procedural fairness and identifying a reversal of the fair process effect for risk seeking people.

Study 2

Having identified the nature of the interaction between procedural justice and risk aversion, we next turned to the possible underlying mechanism for this relationship. Specifically, the goal

of Study 2 was to examine Hypotheses 2 and 3 (i.e., that procedural justice reduces uncertainty, and this is in part why people with different levels of risk aversion respond differently to procedural justice), in addition to Hypothesis 1. We chose to do so using a different methodology (responses of workers in an organization), a different dependent variable (performance), and a different culture (that of India, rather than the United States) to enhance external validity.

We chose to conduct this study in India for a variety of reasons. Given that the world is increasingly global, organizational behavior scholars benefit from conducting empirical studies in multiple cultural and national contexts. In particular, because the American economy is increasingly digital (O'Neill, 2009), and because India is an important digital partner, Indian contexts are more important than ever before. Another reason to conduct justice research in a large and rapidly developing country such as India is spelled out by Van den Bos and Lind (2002) who point to differences in the uncertainty faced by people whose societies are undergoing especially rapid change. Thus, we took advantage of the opportunity to use an Indian setting for Study 2. Nevertheless, it is also worth noting that despite critical differences between the cultures prevalent in India and the US (Hofstede, 2001), some research has found no differences in perceptions and reactions to procedural justice in these two countries (Bhupatkar & Bergman, 2008), and as such, we expect our framework to apply to both Indian and US contexts and our results to generalize to both populations.

Method

Sample

Respondents were 70 software engineers (41 men and 29 women) from a large software company in India. Respondents were randomly chosen from among the firm's software engineers by the company's human resource department to receive an email invitation to complete an online survey related to work-related attitudes and perceptions. Participation in the study was voluntary and confidential. Of the 100 employees who received the invitation, 70 chose to participate. All respondents had an undergraduate degree in engineering and had, on average, been employed by the company for 3.22 years. All respondents received a fixed amount of salary on a monthly basis, and received a uniform annual bonus which was contingent on the performance of the company's stock.

Data collection

Employees received an email from the company's human resource department inviting them to take part in an online survey administered by a researcher not employed by the company. It was emphasized that responses would remain confidential and that the researcher would share with the company only aggregate results and not individualized data from the survey. Respondents

had the option of taking part in a lottery sponsored by the researcher where one employee out of ten who participated would win on average 500 Rupees (approximately equal to the price of an elegant restaurant dinner for two in India). The actual amount received by the lottery winners depended on their decision on an investment task as explained below.

Outcome variable: Performance

To measure performance, we used a modified version of Chang and Chang's (2007) measure of self-reported performance containing the original five items and an additional item specific to software developers (Cronbach's $\alpha = .86$). A sample item from the original scale included, "I always work very efficiently." Responses to these items ranged from 1 = strongly disagree to 5 = strongly agree. The additional item was, "In your module, how many bugs were filed by Quality Assurance?" Response to this item ranged from 1 = less than five to 5 = more than 25 [reverse coded]. Fewer bugs filed by Quality Assurance indicated higher performance. To eliminate any order effects, survey items were presented in a randomized fashion to respondents.

Predictor variables: Perceived procedural justice

In this portion of the survey, participants were asked about the procedures used to make decisions about their compensation, appraisals, promotions, bonuses, and so forth. To measure procedural justice, we used a scale developed by Folger and Konovsky (1989) and condensed by Moorman (1991) which measures the focal elements of procedural justice identified by Leventhal, Karuza, and Fry (1980). The scale contained seven items. A sample item included, "Existing procedures are such that the concerns of all those affected by the decision are heard." The items ranged from 1 = strongly disagree to 5 = strongly agree (Cronbach's $\alpha = .89$) and were averaged across items.

Perceived uncertainty

To measure perceived uncertainty, we used a modified version of Ashford's (1986) measure of perceived uncertainty which is frequently used as a measure of perceived uncertainty in organizational contexts, especially in feedback-seeking and uncertainty-reduction research (Anseel & Lievens, 2007; Diekmann, Barsness, & Sondak, 2004; Gupta, Govindarajan, & Malhotra, 1999). In addition to Ashford's original three items, we used two additional items designed to measure perceptions of uncertainty related to pay. A sample item from the original scale included, "It is unclear to me exactly what I should do in order to perform my job better." The two additional items included, "I know exactly how much salary hike I will get at my next evaluation" [reverse coded] and "I do not know how much annual bonus I will receive this year." Responses ranged from 1 = strongly disagree to 5 = strongly agree (Cronbach's $\alpha = .84$).

Risk aversion

To obtain a behavioral measure of risk aversion, participants were presented with a decision exercise designed to assess risk aversion³

³ Johanson (2000) established the construct validity of this measure of risk aversion by demonstrating that it is significantly and negatively correlated with Budner's (1962) Intolerance of Ambiguity Scale. To assess the validity of this scale further, we conducted a pilot test wherein we had 77 MBA students first complete a questionnaire assessing risk propensity using Cable and Judge's (1994) eight item measure of risk aversion, which is based on original scales developed by Slovic (1972) and Gomez-Mejia and Balkin (1989). A sample item included, "I prefer to remain on a job that has problems that I know about rather than take the risks of working at a new job that has unknown problems, even if the new job offers greater rewards." Responses ranged from 1 = strongly disagree to 5 = strongly agree (Cronbach's $\alpha = .76$). Our measure of risk aversion and the Cable and Judge (1994) measure of risk aversion were significantly correlated ($r = .27, p < .05$).

(Charness & Gneezy, 2010; Gneezy & Potter, 1997; Haigh & List, 2005; March, 1996). Respondents were asked how much they would hypothetically invest in a risky investment; the less they invested the more risk averse they were. Participants were asked to choose a portion of an imagined endowment of 500 Rupees (between 0 and 500, inclusive) that they wished to invest in a risky investment. There was a two-thirds chance that the investment would fail and a one-third chance that the investment would succeed. If the investment failed, participants would lose the amount they invested; if the investment succeeded, they would receive 3.5 times the amount they invested. Risk aversion was measured as the percentage of this endowment not invested in the risky investment, such that the higher the value of this variable, the more risk averse the individual. There was a one in ten chance that participants would be selected to receive payment based on their decision in this task, and as such, amount not invested is a behavioral measure of risk aversion.

Control variables

As in Study 1, we included participants' age, sex, income, and job tenure in the analyses to control for potential demographic effects that have been shown to be associated with performance (e.g., Fritz, Yankelevich, Zarubin, & Barger, 2010).

Results and discussion

We evaluated our hypotheses in three separate steps. First, we examined a simple moderation model to test if people with different levels of risk aversion respond differently to procedural justice (Hypothesis 1). Second, we conducted regression analysis to examine whether procedural justice is negatively related to perceived uncertainty (Hypothesis 2). Lastly, we tested the overall moderated mediation hypothesis to examine whether reduction in perceived uncertainty can explain why people with different levels of risk aversion react differently to procedural justice (Hypothesis 3). Prior to the analyses, all continuous measures were mean centered (Aiken & West, 1991). Table 3 provides the means, standard deviations, and intercorrelations among the key variables.

Test of moderation

To test our prediction that risk aversion moderates the relationship between procedural justice and performance (Hypothesis 1), we conducted a hierarchical, moderated regression analysis on performance, entering the predictor variables in the following order: (i) control variables – age, sex, income, and job tenure; (ii) independent variables – procedural justice and risk aversion; and (iii) their two-way interaction term. The results of the regression are provided in Table 4. As predicted, the 2-way interaction of procedural justice and risk aversion on performance was significant ($\beta = -.39, p < .01$). To illustrate the nature of the 2-way interaction, we exhibit in Fig. 3 the predicted values of the dependent variable at one standard deviation above and one standard deviation below the means for the independent variables (Aiken & West, 1991). Unlike risk averse people, whose performance tended to increase with increasing procedural justice (simple beta = .68, $p < .05$), for risk seeking people, their performance tended to decrease with procedural justice (simple beta = $-.10, p < .10$), thus demonstrating a marginally significant reversal of the fair process effect for risk seeking individuals.

Test of uncertainty reduction mechanism

To test Hypothesis 2, we regressed perceived uncertainty on procedural justice while controlling for age, sex, income, and job

Table 3
Summary statistics, correlations, and scale reliabilities^a (Study 2).

	Mean	SD	1	2	3	4	5	6	7	8
1. Performance	4.23	0.53	(0.86)							
2. Age	27.36	1.62	0.21 [†]	–						
3. Sex	0.70	0.47	–0.07	–0.07	–					
4. Income	2.90	0.97	0.16 [†]	0.91 ^{***}	–0.10	–				
5. Job tenure	38.65	9.08	–0.12	0.35 ^{**}	–0.13	0.40 ^{***}	–			
6. Procedural justice	3.39	0.74	0.31 ^{**}	0.09	0.08	0.04	–0.04	(0.89)		
7. Risk aversion	47.48	25.9	–0.19 [†]	–0.02	–0.01	–0.05	–0.09	–0.15	–	
8. Perceived uncertainty	3.62	0.76	–0.33 ^{**}	0.08	–0.20 [†]	0.09	0.08	–0.33 ^{**}	–0.02	(0.84)

Note. All tests of variables are two-tailed (N = 70).

^a Scale reliabilities (Cronbach's alpha) in parenthesis.

[†] p ≤ .10.

^{*} p ≤ .05.

^{**} p ≤ .01.

Table 4
Summary of hierarchical regression analysis of variables predicting job performance^a (Study 2).

	Step 1	Step 2	Step 3
<i>Control variables</i>			
Age	0.38	0.33	0.30
Sex	–0.09	–0.11	–0.15
Job tenure	–0.23 [†]	–0.22 [†]	–0.26 [*]
Income	–0.10	–0.08	–0.09
<i>Main effects</i>			
Procedural justice		0.26 [*]	0.29 ^{**}
Risk aversion		–0.18	–0.30 [*]
<i>Two-way interaction</i>			
Risk aversion × Procedural justice			–0.39 ^{**}
Model F	1.78	2.75 [*]	4.58 ^{***}
R ²	0.10	0.21	0.34
ΔR ²		0.11	0.13
Adjusted R ²	0.04	0.13	0.27

Note. All tests of variables are two-tailed (N = 70).

^a Beta coefficients are standardized.

[†] p ≤ .10.

^{*} p ≤ .05.

^{**} p ≤ .01.

^{***} p ≤ .001.

Table 5
Summary of hierarchical regression analysis of variables predicting perceived uncertainty^a (Study 2).

	Step 1	Step 2
<i>Control variables</i>		
Age	0.03	0.12
Sex	–0.19	–0.17
Job tenure	0.03	0.01
Income	0.03	–0.03
<i>Main effect</i>		
Procedural justice		–0.33 ^{**}
Model F	0.76	2.22 [†]
R ²	0.05	0.15
ΔR ²		0.10
Adjusted R ²	–0.01	0.08

Note. All tests of variables are two-tailed (N = 70).

^a Beta coefficients are standardized.

[†] p ≤ .10.

^{*} p ≤ .05.

^{**} p ≤ .01.

^{***} p ≤ .001.

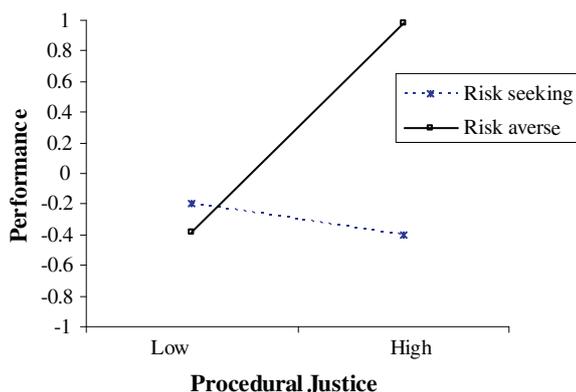


Fig. 3. Two-way interaction between procedural justice and risk aversion (Study 2).

tenure $F(5, 64) = 2.22, p < .05$. The results of this regression are presented in Table 5. As predicted, perceived uncertainty was significantly and negatively correlated with procedural justice ($\beta = -.33, p < .01$). Given the correlational nature of this study, it is not possible to infer the causality of the relationship between procedural justice and uncertainty but it is worthwhile to note that the relationship is negative.

Tests of moderated mediation

Hypothesis 3 suggests an indirect effects model, whereby the relationship between procedural justice and performance is transmitted by a reduction in perceived uncertainty. Tests of such mediation hypotheses are often conducted using the multistep approach proposed by Baron and Kenny (1986). Recently, however, researchers have questioned the appropriateness of this approach (Edwards & Lambert, 2007; Kenny, Kashy, & Bolger, 1998; MacKinnon, Krull, & Lockwood, 2000; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002; Preacher & Hayes, 2004; Shrout & Bolger, 2002) and have suggested that mediational analyses ought to be based on formal significance tests of the indirect effect. The Sobel (1982) test is one such popular test but it test relies on the assumption that the indirect effect is normally distributed. This assumption is problematic, because the distribution of the product term constituting the indirect effect is known to be not normal, even when the predictor variables constituting the product term are normally distributed (Edwards & Lambert, 2007). As a solution to this problem, bootstrapping has been suggested. Through the application of bootstrapped confidence intervals, it is possible to avoid power problems introduced by asymmetric and other non-normal sampling distributions of indirect effects (MacKinnon, Lockwood, & Williams, 2004). In accordance, we tested the moderated mediation hypothesis (Hypothesis 3) using an application generously provided by Preacher, Rucker, and Hayes (2007). Their application comprises a SPSS macro that estimates the indirect

Table 6
Summary of analysis of moderated mediation^a (Study 2).

Predictor	B	SE	t	p
<i>Perceived uncertainty</i>				
Constant	-1.79	3.96	-0.45	0.65
Age	0.08	0.17	0.45	0.66
Sex	-0.36	0.25	-1.41	0.16
Job tenure	0.00	0.01	0.08	0.94
Income	-0.03	0.29	-0.11	0.92
Procedural justice	-0.33	0.12	-2.79	0.01
<i>Performance</i>				
Constant	-4.02	3.44	-1.17	0.25
Age	0.21	0.15	1.40	0.17
Sex	-0.41	0.22	-1.85	0.07
Job tenure	-0.03	0.01	-2.30	0.02
Income	-0.10	0.25	-0.41	0.68
Procedural justice	0.20	0.11	1.80	0.08
Perceived uncertainty	-0.26	0.11	-2.39	0.02
Risk aversion	-0.30	0.11	-2.82	0.01
Interaction	-0.34	0.11	-3.20	0.00
<i>Risk aversion</i>				
Boot indirect effect	Boot SE	Boot t	Boot z	Boot p
<i>Conditional indirect effect at risk aversion ± 1 SD</i>				
-1 SD	-0.02	0.06	-0.42	0.67
M	0.08	0.04	1.96	0.05
+1 SD	0.19	0.07	2.66	0.01

Note. $N = 70$. Unstandardized regression coefficients are reported. Bootstrap sample size = 5000. Range of values represent an abbreviated version of the output provided by the macro.

effect not only using Sobel's (1982) normal theory approach but also uses a bootstrapping technique. The Preacher et al. (2007) macro incorporates the stepwise procedure put forth by Baron and Kenny (1986) and generates confidence intervals (CIs).⁴

Table 6 presents the results from the moderated-mediation analysis. Results indicated that the cross-product term between perceived uncertainty and risk aversion on performance was significant ($B = -.34$, $p < .01$). To fully support Hypothesis 3, we needed to examine if the form of this interaction conformed to the hypothesized pattern. Therefore, we applied conventional procedures for plotting simple slopes (see Fig. 4) at one standard deviation above and below the mean of the risk aversion measure. Supporting Hypothesis 3, the slope of the relationship between perceived uncertainty and performance was significant (and negative) for risk averse individuals (simple slope = $-.60$, $p < .01$) consistent with our expectations, whereas the slope was non significant for risk seeking individuals (simple slope = $.08$, $p = n.s.$).

Although the results show that risk aversion interacted with perceived uncertainty to influence performance, they do not directly assess the conditional indirect effects. Therefore, we examined the conditional indirect effect of procedural justice on performance (through perceived uncertainty) at three values of risk aversion (see Table 6): the mean, one standard deviation above the mean, and one standard deviation below the mean. Normal-theory tests indicated that two of the three conditional indirect effects (based on moderator values at the mean and at one standard deviation above the mean) were positive and significantly different from zero. Bootstrap CIs corroborated these results.

The results of Study 2 provide strong support to some of our hypotheses and partial support to others. The findings show that (1) risk aversion moderated the relationship between procedural justice and performance such that risk averse individuals responded positively to increased procedural justice while risk

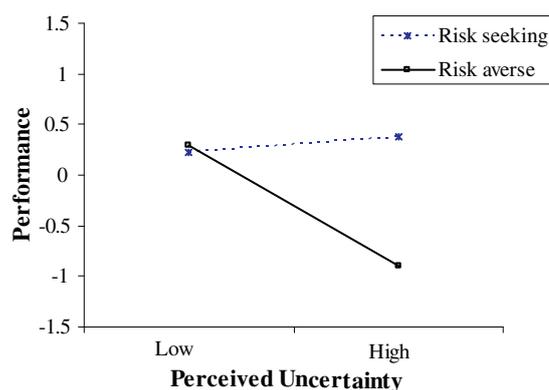


Fig. 4. Two-way interaction between perceived uncertainty and risk aversion (Study 2).

seeking individuals responded negatively, again showing a reversal of the fair process effect and supporting Hypothesis 1; (2) procedural justice and perceived uncertainty were negatively related, consistent with Hypothesis 2; and (3) risk aversion indeed moderated the relationship between perceived uncertainty and performance. Whereas people who were more risk averse performed better when they perceived less uncertainty (which was related with increased procedural fairness) consistent with Hypothesis 3, people who were more risk seeking were not significantly affected by the reduced perceived uncertainty. Therefore, our results suggest that this difference between risk averse and risk seeking people's performance is in part accounted for by a reduction in perceived uncertainty when procedures are perceived to be fair.

One limitation of Study 2 was its reliance on self-reported data, raising concerns regarding common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Also, since it was a correlational study, the causal relationship between procedural justice and uncertainty was not clear. To address these concerns, we conducted an experiment wherein we examined the moderating role of risk aversion on reactions to procedural justice in an entirely different context, using different measures of the independent and dependent variables than in Study 2. In the following experiment, we manipulated procedural justice using voice and no-voice procedures and uncertainty regarding one's own outcomes.

Study 3

In Study 3, we manipulated procedural justice, measured participants' risk aversion, and examined the effect of these two variables on actual performance. Participants engaged in a task for which their performance could be measured objectively.

A widely accepted and well documented manipulation of procedural justice is varying whether or not participants are allowed an opportunity to voice their opinion about a decision that might affect them (e.g., De Cremer & Sedikides, 2008; Van den Bos, 1999). In the current experiment, we manipulated procedural justice (voice) by randomly making some participants ultimatum job offers of the "take-it-or-leave-it" kind while allowing others to negotiate by letting them voice a counter-offer in response to the original offer made to them (final offers were constant across both conditions). Intrinsic to any bargaining process is the notion of offers and replies. Ultimatum offers permit only "yes" or "no" replies, thereby limiting voice. On the other hand, a bargaining structure wherein participants are permitted to make a counter-offer allows participants more voice. Therefore, these two different bargaining structures were well suited as forms of procedural justice manipulation in our study.

⁴ We thank two anonymous reviewers for their suggestion in how to assess this hypothesis.

Method

Sample

One hundred five students (69 men and 36 women) enrolled in undergraduate organizational behavior classes at a university in the US participated in the experiment and received course credit for their participation. Based on the number of points accumulated during the experiment, one participant out of every ten received \$10.

Design

This experiment employed a two factor design with one manipulated independent variable (procedural justice) and one measured independent variable (risk aversion). Participants were randomly assigned to one of two procedural justice conditions (voice vs. no-voice); the second factor, risk aversion, was measured as described below.

Procedure

On arrival at the laboratory, participants were led to separate computer terminals. On their desks, participants found a computer keyboard, mouse, and a computer screen. Participants also found a booklet and a pen. Participants were first presented with the following situation by reading their booklets:

You have been made an offer by Patel & Co. to solve mazes for them. However, their competitor, Desai & Co., would also like to make you an offer for doing the same task. You can work for either Patel & Co. or for Desai & Co.

A representative of Desai & Co. is present here today and she will either make you a “take it or leave it” ultimatum offer or she will allow you to negotiate with her by making a counter-offer. If you are allowed to make a counter-offer, she will consider your offer and either accept it or make a final offer. If you accept her final offer, you will solve mazes for Desai & Co. at the wage you agreed to; if you reject her offer, you will solve mazes for Patel & Co. at the rate offered by them.

Please note that in the past the going rate for this task was 24 points per maze with 50% chance.

The reason for including Patel & Co. in the design was to provide an alternative outcome to the participants that they could choose instead. If the participants did not like the offer made by Desai & Co. or the procedure used by them, they would have an opportunity to reject the offer and work for Patel & Co. instead. The logic behind providing the participants with the past going rate for the task was to provide them with an additional reference point – especially for deciding what counter-offers to make in the procedurally fair condition. Providing them with a reference point in addition to a relatively low alternative outcome ensured that participants would choose to work for Desai & Co., who always offered a little more than the past going rate. Participants were made aware of both ultimatum and negotiation conditions by design so that they knew that both no-voice and voice procedures were available, as recommended by Van den Bos (1999).

Participants then solved one maze for practice. To solve a maze, participants had to navigate a blue dot through the maze and make it reach a square, shaded “house” at the end of the maze using the arrow keys on the keyboard.

Procedural justice manipulation

Participants in the no-voice condition were made an ultimatum offer of 25 points per maze with 50% chance of getting paid whereas participants in the voice condition were offered the same wage and probability, albeit, as the last offer in a negotiation.

Participants rated three seven-point items designed to measure their perceptions of procedural justice associated with the process that had just taken place (see Blader & Tyler, 2003). A sample item was, “The situation was handled in a fair manner.” Responses to these items ranged from 1 = strongly disagree to 7 = strongly agree (*Cronbach's* $\alpha = .97$).

Perceived uncertainty

Participants then rated three seven-point items designed to measure their perceptions of uncertainty (see Smith & Ellsworth, 1985). A sample item was, “I can predict what will happen next” [reverse coded]. Responses to these items ranged from 1 = strongly disagree to 7 = strongly agree (*Cronbach's* $\alpha = .79$).

Risk aversion

To measure risk aversion, participants were presented next with the same decision exercise used in Study 2 (Gneezy & Potter, 1997; Johanson, 2000; March, 1996). Participants were given 500 points and asked to choose a portion of this amount (between 0 and 500, inclusive) that they wished to invest in a risky investment; these points had real monetary value to participants because they, along with the points earned from completing the mazes, determined the probability of winning the lottery. There was a two-thirds chance that the investment would fail and a one-third chance that the investment would succeed. If the investment failed, participants would lose the amount they invested; if the investment succeeded, they would receive 3.5 times the amount they invested. Risk aversion was measured as the percentage of points not invested in the risky investment, such that the higher the value of this variable, the more risk averse the individual.

Performance

The dependent variable, performance, was computed as the number of mazes that participants solved in 45 min.

Results and discussion

In the voice condition, all participants chose to negotiate with the exception of four participants who were not included in further analysis. Excluding them from the analysis did not change the results. Also, including the difference between participants' counter offer and the final offer did not alter the results.

Manipulation check

To examine if our manipulation of procedural justice was successful, we conducted an ANOVA with perceived procedural justice as the dependent variable and sex and manipulated condition (i.e., voice vs. no-voice) as the independent variables. Participants' response on the perceptions of procedural justice scale showed a main effect for manipulated procedural justice only, $F(1, 103) = 29.42$, $p < .001$. Participants in the voice condition judged the procedure to be more fair ($M = 5.18$, $SD = 1.40$) than those in the no-voice condition ($M = 3.69$, $SD = 1.38$).

As in Study 2, we tested our hypotheses in three separate steps. First, we examined a simple moderation model to test if people with different levels of risk aversion respond differently to procedural justice (Hypothesis 1). Second, we conducted regression analysis to determine whether procedural justice reduces perceived uncertainty (Hypothesis 2). Lastly, we tested the overall moderated mediation hypothesis to examine whether the reduction in perceived uncertainty can explain why people with differing levels of risk aversion react differently to procedural justice (Hypothesis 3). Prior to the analyses, all continuous measures were

Table 7
Summary statistics, correlations, and scale reliabilities^a (Study 3).

	Mean	SD	1	2	3	4	5	6
1. Performance	37.3	15.06	–					
2. Age	22.72	2.01	–0.12	–				
3. Sex	0.66	–	0.04	0.02	–			
4. Procedural justice	–	–	0.38**	0.08	0.15†	–		
5. Perceived uncertainty	4.39	1.00	–0.17*	–0.02	–0.02	–0.38***	(0.79)	
6. Risk aversion	62.50	29.36	–0.10	0.22*	–0.08	0.02	–0.07	–

Note. All tests of variables are two-tailed ($N = 105$).

^a Scale reliabilities (Cronbach's alpha) in parenthesis.

† $p \leq .10$.

* $p \leq .05$.

** $p \leq .01$.

*** $p \leq .001$.

Table 8
Summary of hierarchical regression analysis of variables predicting job performance^a (Study 3).

	Step 1	Step 2	Step 3
<i>Control variables</i>			
Age	–0.12	–0.13	–0.01
Sex	0.04	–0.03	0.03
<i>Main effects</i>			
Procedural justice		0.39***	0.37***
Risk aversion		–0.08	0.38**
<i>Two-way interaction</i>			
Risk aversion × Procedural justice			–0.61***
Model F	0.82	5.17**	8.30***
R ²	0.02	0.17	0.30
ΔR ²		0.11	0.13
Adjusted R ²	0.00	0.14	0.26

Note. All tests of variables are two-tailed ($N = 105$).

^a Beta coefficients are standardized.

† $p \leq .10$.

* $p \leq .05$.

** $p \leq .01$.

*** $p \leq .001$.

mean centered (Aiken & West, 1991). Table 7 provides the means, standard deviations, and intercorrelations among the key variables.

Test of moderation

To test our prediction that risk aversion moderates the relationship between procedural justice and performance (Hypothesis 1), we conducted a hierarchical, moderated regression analysis on performance, entering the predictor variables in the following order: (i) control variables – age and sex; (ii) independent variables – procedural justice and risk aversion; and (iii) their two-way interaction term. The results of the regression are provided in Table 8. As predicted, the 2-way interaction of procedural justice and risk aversion on performance was significant ($\beta = -.61, p < .01$). To illustrate the nature of the 2-way interaction, we exhibit in Fig. 5 the predicted values of the dependent variable at one standard deviation above and one standard deviation below the means for the independent variables (Aiken & West, 1991). Unlike risk averse people, whose performance increased with increasing procedural justice (simple slope = .98, $p < .001$), for risk seeking people, there was a negative effect (simple slope = $-.24, p < .05$), offering additional evidence for the reversal of the fair process effect for risk seeking people.

Test of uncertainty reduction mechanism

To test Hypothesis 2, we regressed perceived uncertainty on procedural justice while controlling for age and sex,

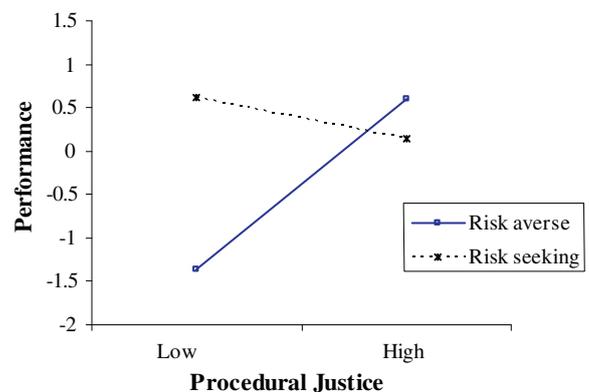


Fig. 5. Two-way interaction between procedural justice and risk aversion (Study 3).

$F(3, 101) = 5.71, p < .01$. The results of this regression are presented in Table 9. As predicted, perceived uncertainty was significantly and negatively correlated with procedural justice ($\beta = -.39, p < .001$). Given that this study was a controlled experiment, the results suggest that being treated fairly reduces the amount of uncertainty experienced in the environment.

Tests of moderated mediation

As mentioned previously, Hypothesis 3 suggests an indirect effects model, whereby the relationship between procedural justice and performance is transmitted by reduction in perceived uncertainty. Table 10 presents the results of moderated-mediation analysis (Preacher et al., 2007). Results indicated that the cross-product term between perceived uncertainty and risk aversion on performance was significant ($B = -0.32, p < .01$). To fully support Hypothesis 3, the form of this interaction should conform to the hypothesized pattern. Therefore, we applied conventional procedures for plotting simple slopes (see Fig. 6) at one standard deviation above and below the mean of the risk aversion measure. The slope of the relationship between perceived uncertainty and performance was significant (and negative) for risk averse individuals (simple slope = $-.44, p < .01$) supporting Hypothesis 3, but the slope of the relationship between uncertainty and performance was positive but not significant for risk seeking individuals (simple slope = .20, $p = n.s.$).

Although the results show that risk aversion interacted with perceived uncertainty to influence performance, they do not directly assess the conditional indirect effects model. Therefore, we examined the conditional indirect effect of procedural justice on performance (through perceived uncertainty) at three values of

Table 9
Summary of hierarchical regression analysis of variables predicting perceived uncertainty^a (Study 3).

	Step 1	Step 2
<i>Control variables</i>		
Age	−0.02	0.01
Sex	−0.02	0.04
<i>Main effect</i>		
Procedural justice		−0.39***
Model F	0.04	5.71**
R ²	0.00	0.15
ΔR ²		0.15
Adjusted R ²	−0.01	0.12

Note. All tests of variables are two-tailed (N = 105).

^a Beta coefficients are standardized.

* p ≤ .05.

** p ≤ .01.

*** p ≤ .001.

Table 10
Summary of analysis of moderated mediation^a (Study 3).

Predictor	B	SE	t	p
<i>Perceived uncertainty</i>				
Constant	0.37	1.11	0.34	0.74
Age	−0.02	0.05	−0.34	0.73
Sex	0.01	0.20	0.05	0.96
Procedural justice	−0.22	0.10	−2.27	0.03
<i>Performance</i>				
Constant	0.11	1.10	0.10	0.92
Age	−0.01	0.05	−0.14	0.89
Sex	0.09	0.20	0.48	0.64
Procedural justice	0.24	0.10	2.50	0.01
Perceived uncertainty	−0.12	0.09	−1.26	0.21
Risk aversion	0.18	0.10	1.83	0.07
Interaction	−0.32	0.11	−3.03	0.00
<i>Risk aversion</i>				
Boot indirect effect	Boot SE	Boot t	Boot z	Boot p
<i>Conditional indirect effect at Risk aversion ± 1 SD</i>				
−1 SD	−0.05	0.04	−1.14	0.25
M	0.03	0.03	1.03	0.30
+1 SD	0.10	0.07	1.78	0.05

Note. N = 105. Unstandardized regression coefficients are reported. Bootstrap sample size = 5000. Range of values represents an abbreviated version of the output provided by the macro.

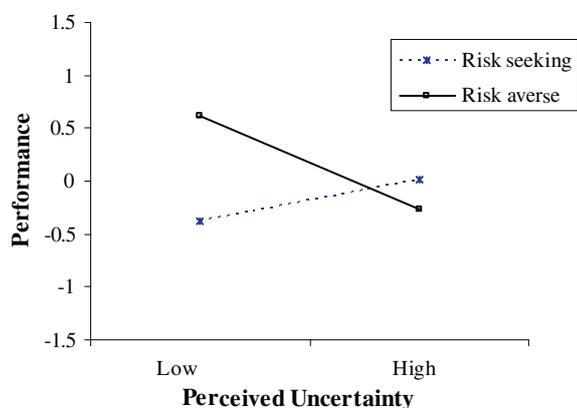


Fig. 6. Two-way interaction between perceived uncertainty and risk aversion (Study 3).

risk aversion (see Table 10): the mean, one standard deviation above the mean, and one standard deviation below the mean. Normal-theory tests indicated the conditional indirect effect

(based on moderator values at +1 standard deviation above the mean) was significantly different from zero. Bootstrap CIs corroborated these results. Overall, results from Study 3 are consistent with the findings from Studies 1 and 2 and confirm that risk averse and risk seeking people react differently to fair procedures, and these differences stem in part from the uncertainty reducing property of procedural fairness.

General discussion

The results of the above three studies break new ground. First, we demonstrated across three studies using different methodologies and different samples from different cultures a “reversal effect” whereby some people (risk seeking individuals) react negatively to fair procedures. To show strong evidence of a reversal effect for procedural justice is, as Brockner (2010) suggested, intriguing and noteworthy because it runs counter to the vast majority of theory and empirical research on the fair process effect, which repeatedly has shown that people respond positively to procedural justice, and raises questions about the resulting across-the-board recommendations given to managers to implement decisions with high procedural fairness. Second, we empirically tested and supported one important claim of the uncertainty management model (Lind & Van den Bos, 2002; Van den Bos & Lind, 2002), upon which our theorizing was based, that the experience of procedural justice lowers perceptions of uncertainty prevalent in the environment. Finally, we found that the proposed uncertainty reducing properties of procedural justice seem to matter more for some people (those who are risk averse) but unexpectedly had little effect on others (those who are risk seeking). We discuss each of these findings and their implications for theory and practice below.

Theoretical contributions

While the literature on and theoretical models of organizational justice have traditionally focused on the positive effects of procedural justice, some researchers have recently begun to examine when more procedural justice is not always better than less, and may actually be worse (see Brockner et al., 2009 for review). Much of the current research is now focused on identifying under what conditions, with whom, and why the fair process effect will be attenuated (less positive effect of procedural justice), eliminated (no effect), or even reversed (negative effect). Our results add to this nascent but growing body of work. It is becoming increasingly clear that there are several moderating factors which limit the positive effect of procedural justice and it is critical that organizational justice theorists incorporate such factors into their models and understand the underlying mechanisms. We focused on one important individual difference, that of risk aversion, and showed that those individuals who are relatively risk seeking respond negatively to procedural justice while those individuals who are risk averse respond positively.

Our results provide empirical support for a central claim of the uncertainty management model (Lind & Van den Bos, 2002; Van den Bos & Lind, 2002) – that being treated fairly reduces individuals’ perception of uncertainty in the environment. Across both a field study and a lab study, we found that perceptions of uncertainty were reduced when people experienced procedural justice, thus confirming an important mechanism of procedural justice delineated by the uncertainty management model.

The uncertainty management model, like much social psychology (cf., Young & Morris, 2004), assumes that people universally do not like uncertainty. Other perspectives, however, do not share this assumption. By borrowing the economic assumption that risk

aversion is an individual difference with a fairly large range, we were able to contribute to the psychology of procedural fairness and the uncertainty management model. We agree that many people do not like uncertainty; for them, fair procedures provide not only the direct benefits of status enhancement and a morally desirable organizational context but also the indirect benefit of lowering uncertainty and thus making it more manageable. But our results show that for those who are relatively risk seeking, the uncertainty reducing indirect effect of procedural justice does not in itself have a positive relationship to job related outcomes. Thus while our results provide empirical support for the general point of the uncertainty management theory, they indicate an important boundary condition.

While we expected that the uncertainty reducing properties of procedural justice would account for both the positive reaction of risk averse individuals (the fair process effect) as well as the negative reaction of risk seeking individuals (a reversal effect) to fair treatment, our results reveal that this predicted underlying mechanism is only partly responsible for these effects. Risk averse individuals responded positively to procedural fairness and its uncertainty reducing properties, consistent with our framework. Risk seeking individuals responded negatively to procedural fairness in two of our studies (see Figs. 3 and 5), but our results suggest they did not respond relatively negatively to procedural fairness wholly because of its uncertainty reducing properties (see Figs. 4 and 6). Given that this finding was unexpected, we can only speculate about other possible factors and suggest avenues for future research. One factor could be that as suggested by various scholars, uncertainty is a multifaceted construct (e.g., De Cremer, Brebels, & Sedikides, 2008; Rowe, 1994; Van den Bos & Lind, 2002) and whereas our measures in Studies 2 and 3 may have captured some elements, they may not have captured others. Another factor may be that other mechanisms in addition to reduced uncertainty may account for risk seeking individuals' reactions to procedural fairness. Future researchers may want to explore whether procedural justice reduces uncertainty about different kinds of outcome and self-evaluative concerns, and if risk aversion moderates those relationships, and also whether other mechanisms in addition to reduced uncertainty account for the responses to procedural justice.

Practical implications

Understanding the factors affecting performance and job satisfaction is of course a matter of practical and managerial importance. One such factor is procedural justice, as shown in many studies (for reviews, see Colquitt et al., 2001; Latham & Lee, 1986). Our findings, however, suggest that managers should exercise care before using the umbrella application of high procedural justice as a performance and satisfaction building strategy because risk seeking employees may not respond positively to greater procedural justice. We do not mean to suggest, however, that managers should discard procedural justice as a way to enhance employee performance and satisfaction. Rather, managers who desire to use procedural justice for performance and satisfaction enhancing purposes may need to be aware of the potential negative effect of procedural justice and create more idiosyncratic forms of employee relationships (see Greenberg et al., 2004; Rousseau, Ho, & Greenberg, 2006). Among risk averse employees, higher procedural justice may be an effective performance and satisfaction enhancing strategy. In contrast, risk seeking individuals may respond better to other, additional performance and satisfaction enhancing strategies. One management strategy recommended by Cadsby, Song and Tapon, (2007) in the domain of compensation, might be to offer employees the option of pay-for-performance or fixed-salary compensation, and allow risk averse

and risk seeking individuals to self-select into compensation schemes that appeal to them the most. This procedure will not only be fair in terms of providing voice but will also let risk averse people choose the safer compensation scheme. However, managers must make sure that such idiosyncratic employment arrangements are legitimate, communicated openly, and are based on values espoused throughout the organization (Rousseau et al., 2006).

Appreciating contingencies and irreducible variance among employees are components of wise management. For managers to know what motivates, they must know what motivates each particular individual. Getting managers to appreciate the factors which affect an individual's motivation may help to apply more effectively the recommendations broadly made in the literature to treat people fairly.

Limitations and future directions

Responding to Greenberg's (2007) call for methodological diversity in fairness research, in this paper we have tested our hypotheses by employing a range of methods, measures, and samples. We started out by developing hypotheses and then testing them using archival data from the General Social Survey, as well as new data from the field and laboratory settings. We used three independent samples—adults from the general US population, Indian software engineers, and US business students, and used different measures of our key independent and dependent variables. The fact that we obtained highly consistent patterns of results in spite of methodological differences and for two important organizational variables – employees' performance and job satisfaction – augurs well for the robustness of our findings. Nonetheless, each study reported here has its limitations, such as the use of a two-item measure for job satisfaction in Study 1, the use of self-reported performance data in Study 2, and limiting procedural justice to a voice or no-voice manipulation in Study 3.

Although we recognize the imperfections of each of these studies, we also recognize that the limitations in each individual study were counterbalanced by strengths in the others. For example, the limitation of using self-reported performance data in Study 2 was addressed by measuring performance objectively in Study 3. And although procedural justice was limited to a voice or no-voice manipulation in Study 3, we were able to study it in its broader sense (Leventhal et al., 1980) in Studies 1 and 2. Also, it is noteworthy that we obtained the predicted moderated mediational effect across both US and Indian samples. Lastly, the shortcoming of using only financial risk aversion measures in Studies 2 and 3 is addressed by combining financial risk aversion with a non-financial form of risk aversion to form an index of risk aversion measure which we used in Study 1. In spite of all these differences, the results across the three studies were consistent with one another. And, because of these differences, the external validity of the results of each study is enhanced. Future researchers may want to test our hypotheses using other measures of risk aversion (see Bechara, Damasio, Damasio, & Anderson, 1994; Lejuez et al., 2002), with other samples, and with different decision making contexts.

Our theoretical arguments and empirical results help illuminate an important mechanism underlying people's response to fair procedures and thereby elucidate the uncertainty management theory (Lind & Van den Bos, 2002; Van den Bos & Lind, 2002), namely that procedural justice mitigates the effects of uncertainty in part because it lowers perceptions of uncertainty. Future researchers may want to explore alternate mechanisms responsible for whether people react favorably or unfavorably to procedural justice. In particular, another mechanism proposed by Van den Bos and Lind (2002) is that procedural justice makes uncertainty more tolerable instead of lowering its perceived magnitude. In the pres-

ence of procedural justice, it is possible that a temporary positive shift in people's tolerance for uncertainty might occur. According to this argument, when people perceive they are treated fairly, their tolerance for uncertainty increases, though the perceived level of uncertainty stays the same. In some cases, this shift may occur in conjunction with or instead of the decrease in the perceived magnitude of uncertainty, we observed in the studies reported here. Although we did not observe any correlation between procedural justice and risk aversion in any of our studies, it is possible that such relationships may be evidenced in situations other than those explored here.

Another avenue for future research would be to explore if the pattern of results we obtained for procedural justice might be obtained for other forms of justice as well. We encourage future research to examine whether the results would be similar with distributive and interpersonal forms of justice as well. And lastly, as noted in the preceding section, we did not distinguish between different forms of uncertainty. Uncertainty is a multi-dimensional construct and therefore, a careful investigation of its various aspects, the relationship of these aspects with procedural justice, and their effects on different organizational variables and outcomes would be helpful.

Conclusion

The findings in this paper tell us something new and fundamental about people's reactions to procedurally fair treatment. Our findings indicate that risk seeking people respond negatively to fair treatment, fair treatment lowers perceptions of uncertainty, and whereas this effect leads to higher performance among risk averse people, it can eliminate the effects of procedural justice on performance among risk seeking people.

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