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Beyond Procedure's Content:  
The Role of Accessibility Experiences and Personal Uncertainty in  
Procedural Justice Judgments

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### Abstract

Procedural justice concerns play a critical role in economic settings, politics, and other domains of human life. Despite the vast evidence corroborating their relevance, considerably less is known about *how* procedural justice judgments are formed. Whereas earlier theorizing focused on the systematic integration of content information, the present contribution provides a new perspective on the formation of justice judgments by examining the influence of accessibility experiences. Specifically, we hypothesize that procedural justice judgments may be formed based on the ease or difficulty with which justice-relevant information comes to mind. Three experiments corroborate this prediction in that procedures were evaluated less positively when the retrieval of associated unfair aspects was easy compared to difficult. Presumably this is because when it feels easy (difficult) to retrieve unfair aspects, these are perceived as frequent (infrequent), and hence the procedure as unjust (just). In addition to demonstrating that ease-of-retrieval may influence justice judgments, the studies further revealed that reliance on accessibility experiences is high in conditions of personal certainty. We suggest that this is because personal uncertainty fosters systematic processing of content information, whereas personal certainty may invite less taxing judgmental strategies such as reliance on ease-of-retrieval.

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Social perception, affect, attitude, and behavior are known to be strongly influenced by justice judgments, which play a major role in many domains of human life (Van den Bos & Lind, 2002). For instance, justice concerns systematically affect key organizational variables (for meta-analytic overviews, see Cohen-Charash & Spector, 2001; Colquitt, Conlon, Wesson, Porter, & Ng, 2001), such as organizational identification (e.g., De Cremer & Blader, 2006) or job satisfaction (e.g., Ambrose & Schminke, 2009). Moreover, individuals are particularly sensitive to justice information (e.g., Schmitt, Gollwitzer, Maes, & Arbach, 2005). Despite the vast evidence corroborating the relevance of justice judgments and an impressive literature on why justice judgments are so relevant (e.g., Tyler & Blader, 2003), considerably less is known about *which source of information* these judgments are based on. This is true for justice judgments about the outcome of a resource allocation (distributive justice; Adams, 1965), but even more so for judgments about the procedure of this resource allocation (procedural justice; Thibaut & Walker, 1975).

To date, most conceptions of procedural justice judgments define characteristics of the procedure itself as the main source of judgment relevant information (e.g., if and how a person is granted voice over the course of the procedure; Folger, 1977). The present contribution identifies so-called cognitive feelings (Clore, 1992) as an additional source of information that individuals may draw upon when forming justice judgments. Specifically, we hypothesize that experiences of ease or difficulty when retrieving relevant information from memory, generally referred to as ease-of-retrieval feelings or accessibility experiences (for reviews, see Schwarz, 1998, 2004), may be relied upon in the formation of justice judgments. In addition, the present

contribution identifies personal uncertainty—the subjective sense of doubt or instability that arises when a person experiences unclear or inconsistent self-relevant cognitions (cf. McGregor, Zanna, Holmes, & Spencer, 2001; Van den Bos & Lind, 2009)—as an important moderator of this reliance. Specifically, we hypothesize that reliance on accessibility experiences is particularly pronounced in conditions of personal certainty. What follows is to substantiate these two hypotheses. We first focus on the formation of procedural justice judgments and the hypothesized role of accessibility experiences, before then addressing the presumed moderating impact of personal uncertainty.

*Procedural justice judgments based on content and accessibility experiences*

Procedural justice judgments have been conceptualized as the result of a comparison between process characteristics and certain reference points, such as generalized procedural rules (Leventhal, 1980), prototypes of just and unjust procedures (Ambrose & Kulik, 2001), or counterfactuals (Folger & Cropanzano, 2001). Common to these models is the assumption that the frequency of rule violations (when reference-point and actual process do not match) and the distance between the reference-points and the actual process characteristics are used to assess how just a process is. Moreover, the models share the focus on *content* information consciously accessible at the time of judgment (e.g., the characteristics of the procedure), whereas other sources of information (e.g., accessibility experiences) are not addressed.

Extending this perspective, the present contribution suggests that individuals may estimate the *frequency* of norm violations by relying on accessibility experiences that accompany the retrieval of content information from memory. Specifically, we suggest that individuals may form justice-relevant judgments—such as how many norms were violated in a given procedure—by relying on the ease or difficulty with which pertinent instances (i.e., instances in which reference points and actual characteristics of the procedure do not match) can be retrieved from memory. When coming up with aspects of the procedure that are far

removed from the corresponding reference points is easy, individuals may conclude that there must have been many of these aspects and that the procedure was therefore relatively unjust. Conversely, when this task is difficult, individuals may conclude that there could not have been many of these aspects and that the procedure was therefore relatively just.

Although such feeling-based inferences may not appear intuitive on first glance, they have received considerable support in other domains of research. Perhaps most important in the present context, it has been shown that the frequency of some target is judged to be higher the more easily according examples can be retrieved from memory (Tversky & Kahneman, 1973; see also Greifeneder & Bless, 2008). Ease-of-retrieval feelings were also observed to influence, for instance, judgments about the self (Schwarz et al., 1991), others (e.g., Dijksterhuis, Macrae, & Haddock, 1999), and abstract concepts like attitude strength (Haddock, Rothman, Reber, & Schwarz, 1999). This short-list of findings suggests that ease-of-retrieval is an important source of information that individuals appear to rely on in a variety of judgmental contexts (for a review, Greifeneder, Bless, & Pham, in press).

#### *Personal uncertainty moderates reliance on accessibility experiences*

When there is more than one source of information to draw upon, it is interesting to understand when the one is preferred over the other. The present contribution focuses on personal uncertainty, which is defined as the “subjective sense of doubt or instability in self-views, world-views, or the interrelation between the two” (Van den Bos & Lind, 2009, p. 124). Differences in personal uncertainty may result from situational variation, such as when the sudden and unexpected death of a close other shakes one's world, as well as interindividual variation, in that some individuals generally report higher levels of doubts and instabilities than others. Note that personal uncertainty is differentiated from informational uncertainty (Van den Bos & Lind, 2009), as further discussed later.

Because personal uncertainty constitutes an uncomfortable and often aversive state, individuals strive to cope with it (Hogg, 2005; Lopes, 1987; Van den Bos & Lind, 2002). One possibility for coping is to accord particular relevance to fairness information (e.g., De Cremer & Sedikides, 2005), especially as individuals have been shown to be less uncertain about themselves (Van den Bos, Heuven, Burger, & Van Veldhuizen, 2006) or better able to tolerate the uncertainties they are experiencing when treated in fair ways (Greenberg, 2006). Personal uncertainty may thus increase the relevance of justice-related concerns. In accordance with current conceptions of dual-process theories (see contributions in Chaiken & Trope, 1999), this heightened relevance is likely to trigger systematic elaboration of the available content information. In contrast, for personally certain individuals, justice-related concerns may be relatively less relevant. Personally certain individuals may therefore be expected to resort to less effortful processing strategies when forming justice judgments, such as reliance on ease-of-retrieval (e.g., Tversky & Kahneman, 1973). Attesting to this reasoning, prior research revealed that ease-of-retrieval experiences are particularly likely to be relied upon in conditions of low processing motivation (e.g., Rothman & Schwarz, 1998).

Together, these considerations translate in a moderation hypothesis, suggesting that personal uncertainty moderates reliance on ease-of-retrieval in procedural justice judgments (for a conceptually related argument in the domain of cooperation behavior, see Müller, Greifeneder, Stahlberg, Van den Bos, & Bless, 2010). It is interesting to note that this moderation hypothesis is conceptually corroborated by findings from De Cremer and Blader (2006), who observed that individuals high in need to belong displayed more systematic or careful processing of procedural fairness information.

In what follows, we first establish the primary effect that ease-of-retrieval experiences may influence procedural justice judgments (Experiment 1), and then provide evidence on the hypothesized moderation. To increase generalizability, the expected moderator, personal

uncertainty, is assessed dispositionally (Experiment 2) as well as manipulated situationally (Experiment 3).

### Experiment 1

Experiment 1 was designed to investigate whether individuals rely on experiences of ease or difficulty when forming procedural justice judgments. We selected a procedure that university students (the population from which participants were drawn) are likely to feel relaxed and certain about. Specifically, a well-known nation-wide university admissions procedure was chosen, which is primarily based on performance in secondary school and thus marks, for university students, the end of a previous life period, which they had successfully mastered.

To investigate *whether* individuals rely on accessible content or ease-of-retrieval when forming procedural justice judgments, we adapted a paradigm introduced by Schwarz and colleagues (1991). In this paradigm—henceforth referred to as ease-of-retrieval paradigm—participants are asked to recall few versus many pieces of information from memory. Here we asked participants to recall two versus four *unfair* aspects of the admissions procedure. If participants rely on content information when evaluating the procedure, they should judge it as less just after retrieving many compared to few unfair aspects. After all, the more unfair aspects there are, the less just the procedure likely is. In contrast, if participants rely on accessibility experiences, they should evaluate the procedure as *more* just after retrieving many (which is difficult) compared to few unfair aspects (which is easy). Presumably, if it is difficult to come up with unfair aspects, there cannot be many of them; hence the procedure is probably just. In contrast, if it is easy to come up with unfair aspects, chances are that there are many of them; hence, the procedure cannot be just. As this description illustrates, the ease-of-retrieval paradigm sets the judgmental stage in such a way that opposing results emerge from reliance

on content information versus reliance on accessibility experiences. The paradigm thus allows for the differentiation between the two information sources.

In line with a vast body of literature (Schwarz, 1998, 2004), more positive judgments after many compared to few negative aspects have been recalled may be interpreted as an indication of ease-of-retrieval. Alternatively, however, it has been speculated that such a finding reflects a disguised content effect. This argument holds that aspects coming to mind later could potentially be of worse quality or of lower extremity than those coming to mind earlier, such that the overall quality or extremity of aspects would be different between the few versus many conditions. To refute this alternative explanation, Experiment 1 employed a yoked design, in that participants either retrieved aspects themselves (writers), or read the aspects retrieved by a yoked participant (readers; see Wänke, Bless, & Biller, 1996). Note that both readers and writers can rely on the same content information, but only writers have access to the experience of ease-of-retrieval associated with retrieving instances from memory. If both readers and writers displayed the same pattern of results, this would suggest that both relied on content information. In contrast, if only writers display the hypothesized pattern of results, a strong case can be made that their judgments are not based on content information, but on ease-of-retrieval.

In sum, we expected that writers would evaluate the university admission procedure more just after recalling many rather than few unfair aspects, because they rely on ease-of-retrieval. Readers—who do not experience ease-of-retrieval—can only resort to content information and were therefore expected to evaluate the procedure less just in the condition of many versus few unfair aspects. A parallel pattern of results was predicted for the evaluation of the institution overseeing the admission procedure, because justice judgments can have further implications for more global judgments, such as organizational attractiveness (Colquitt et al., 2001).



## *Method*

### *Participants*

Forty-eight male University of Mannheim students voluntarily responded to advertisements offering 1 Euro and a chocolate bar in return for taking part in an experiment labeled "Evaluation of the university admissions process."<sup>1</sup> All participants had applied for university admission through a national office ("Zentralstelle für die Vergabe von Studienplätzen", ZVS). On average, participants had studied for 6.5 semesters ( $SD = 4.0$ ) and were 24.2 years of age ( $SD = 3.7$ ). From the 26 participants in the writing condition three did not generate any unfair aspects and were therefore excluded from the analysis. This proceeding did not affect any of the reported significance levels. Additionally, the aspects of one participant in the writing condition were not readable; therefore only 22 participants were assessed in the reading condition.

### *Design and Procedure*

Participants were assigned to a 2 (number of aspects: few vs. many) x 2 (task: writing vs. reading) factorial design. Due to yoking readers to writers, the reading condition was assessed after the writing condition. Both writers and readers were randomly assigned to the number of aspects conditions.

All participants first responded to demographic questions concerning their own university application. Afterwards, *writers* were asked to list either two or four unfair aspects of the ZVS-procedure. At that time, the ZVS regulated the admission process to many subjects taught at German universities, including psychology. Students applied to the ZVS, and the ZVS then assigned prospective students to their future alma maters, taking certain criteria into account (e.g., performance in secondary school), while neglecting others (e.g., internships in related areas). As this procedure was highly standardized and involved virtually no personal contact, it

was an almost ideal evaluative target. Independent pre-testing had revealed that recalling two compared to four unfair aspects about this procedure is easier. To probe for the success of this manipulation, writers answered two manipulation-check questions. Note that the above ZVS description was not relayed to participants, so as to render experiences associated with information recall meaningful.

*Readers* received individual questionnaires, each with the aspects generated by one of the writers.

### *Dependent variables*

*Ease-of-retrieval.* Serving as a manipulation check, *writers* were asked "How easy or difficult was it for you to list unfair aspects of the selection procedure of the ZVS?" and "How easy or difficult would it have been for you to list more unfair aspects?" Answers were given on 9-point rating scales (1, *very difficult*; 9, *very easy*; Cronbach's  $\alpha = .92$ ).

*Procedural justice.* Perceived procedural justice was assessed by asking how just (1, *very unjust*; 9, *very just*), fair (1, *very unfair*; 9, *very fair*), and appropriate (1, *very inappropriate*; 9, *very appropriate*) the ZVS-procedure was perceived (Cronbach's  $\alpha = .93$ ).

*Attitude toward the ZVS.* All participants evaluated the ZVS by means of three items, which read: "The ZVS accomplishes the selection task very well," "I think the ZVS is doing a good job," and "The ZVS is a reasonable institution." (1, *do not at all agree*; 9, *completely agree*; Cronbach's  $\alpha = .92$ ).

## *Results*

### *Manipulation check*

*Writers* answered two items indicating the ease or difficulty associated with recalling unfair aspects from memory. As expected, writers experienced generating two unfair aspects as

easier ( $M = 4.50$ ,  $SD = 2.17$ ) than generating four unfair aspects ( $M = 2.29$ ,  $SD = 0.91$ ),  $F(1, 21) = 10.45$ ,  $p < .01$ ,  $\eta^2 = .33$ .

### *Procedural justice*

Averaged procedural justice judgments were entered into a 2 (number of aspects: few vs. many) x 2 (task: writing vs. reading) ANOVA. No main effects for number of aspects,  $F < 1$ , and for task,  $F(1, 41) = 2.14$ , *ns*, emerged. However, as expected, an interaction effect was observed,  $F(1, 41) = 9.15$ ,  $p < .01$ ,  $\eta^2 = .18$  (see Table 1). Planned contrast analyses revealed that writers evaluated the ZVS procedure as less just after generating few rather than many unfair aspects,  $t(41) = -2.30$ ,  $p < .05$ . In line with prior findings (Schwarz, 1998), this pattern of results suggests that writers relied on ease-of-retrieval experiences in forming procedural justice judgments. This conclusion is further corroborated by the finding that *readers* evaluated the ZVS procedure as more just after reading few rather than many unfair aspects,  $t(41) = 1.98$ ,  $p < .05$ . Since readers could only draw on content information, it appears that the aspects in the few aspects condition were neither more extreme nor of higher quality than those in the many aspects condition. The pattern of results observed for writers is thus unlikely to be a disguised content effect, but best explained as reliance on ease-of-retrieval.

### *Attitude toward the ZVS*

Averaged attitude towards the ZVS was positively correlated to perceived procedural justice,  $r = .79$ ,  $p < .01$ , and entered into a 2 (number of aspects: few vs. many) x 2 (task: writing vs. reading) ANOVA. Again, the hypothesized interaction effect was observed,  $F(1, 41) = 8.67$ ,  $p < .01$ ,  $\eta^2 = .18$  (all other  $F$ s  $< 1$ ). Paralleling the pattern for procedural justice, writers' attitude toward the ZVS was less favorable when few as opposed to many unfair aspects had been retrieved,  $t(41) = -1.86$ ,  $p < .05$  (ease-of-retrieval effect), whereas readers' attitude toward the

ZVS as an institution was more favorable after reading few rather than many aspects,  $t(41) = 2.30, p < .05$  (see Table 1).

### *Discussion*

Experiment 1 tested the hypothesis that participants' evaluation of a nation-wide university admissions process, as well as their judgment about the institution overseeing the process, reflects the ease or difficulty with which information concerning the unfairness of the respective procedure could be brought to mind. Results strongly support this hypothesis, since writers judged the ZVS procedure as more just after recalling many compared to few unfair aspects. This conclusion is further corroborated by the finding that readers, who had only access to content information, showed the reverse pattern of results. Together, the observed findings suggest that justice judgments about a procedure for which uncertainty is not salient may be based on cognitive experiences triggered by the processing of justice information.

Notably, the influence of ease-of-retrieval on procedural justice judgments was strong enough to affect the attitude toward the ZVS as the responsible organization. This is remarkable, as the latter constitutes a more distal judgment, that is supposedly influenced via the proximal variable of procedural justice (e.g., Colquitt, 2001). This finding directly attests to the importance of considering accessibility experiences when conceptualizing the formation of justice judgments.

Experiment 1 revealed a clear pattern of results. However, one might argue that the reported effects were partly due to participants' accessibility experiences being particularly salient. Following general practices in the literature (see Schwarz, 2004), the manipulation check in the writing condition was assessed before justice judgments, which might have unduly heightened the salience of retrieval fluency. To address this objection, the subsequent experiments assessed the manipulation check *after* justice judgments.

Note that Experiment 1 focused on a procedure which is unlikely to render uncertainty salient to the chosen population of university students, as it pertains to a previous life period. In line with the here advanced moderation hypothesis—uncertainty moderates reliance on accessibility experiences—this may have fostered the impact of ease-of-retrieval on justice judgments. To allow for the detection of content effects, Experiments 2 and 3 used a procedure that is related to students' present life period (performance at university), and should therefore be associated with more personal uncertainty.

### Experiment 2

Experiment 2 was designed to shed light on the conditions that moderate individuals' reliance on accessibility experiences. We hypothesized that personal uncertainty would be such a moderating capacity. This is because personal uncertainty has been shown to increase the relevance of justice concerns (e.g., De Cremer & Sedikides, 2005), and relevance, in turn, has been linked to differential information processing. Specifically, higher levels of relevance are generally assumed to be associated with more systematic or careful processing, and lower levels with less taxing judgmental strategies (e.g., Chen & Chaiken, 1999), such as reliance on accessibility experiences (e.g., Tversky & Kahneman, 1973). In line with this reasoning, it has been observed that ease-of-retrieval experiences are relied upon in conditions of low but not high motivation (e.g., Rothman & Schwarz, 1998). By linking this prior research with the literature on personal uncertainty (e.g., Hogg, 2005; Lopes, 1987; Van den Bos & Lind, 2002), the present experiment addresses the hypothesis that accessibility experiences are used in conditions of personal certainty, but not personal uncertainty.

Similar to prior research (e.g., De Cremer & Sedikides, 2005), personal uncertainty was operationalized as self-perceived instability of self-esteem and assessed as a dispositional measure. To manipulate ease-of-retrieval, participants were asked to name either few or many

unfair aspects of a procedure named "Orientierungsprüfung" (in the following referred to as "orientation exam"). The orientation exam needs to be passed by all students in Baden-Württemberg—the federal German state in which the University of Mannheim is located—after the first year of study. The exam tests the knowledge that is supposedly critical to the completion of a degree in a particular field. If a student fails to pass the orientation exam by the third semester (1.5 years), the student loses the right to study this particular subject at any German university. This procedure has been the subject of strong controversy and therefore was as an ideal evaluative target.

### *Method*

#### *Participants*

One hundred male University of Mannheim students of various disciplines voluntarily responded to advertisements offering 1 Euro and a chocolate bar. On average, participants had studied for 4.9 semesters ( $SD = 4.3$ ) and were 24.1 years of age ( $SD = 7.2$ ). Fifty-six percent of participants had already passed the orientation exam.<sup>2</sup> Five participants did not list any unfair aspects of the orientation exam procedure and were therefore excluded from further analyses. None of the reported significance levels was affected by this exclusion.

#### *Design and Procedure*

Accessibility experiences were manipulated by asking participants to retrieve either two or four unfair aspects about the orientation exam from memory. Independent pre-testing had revealed that recalling two unfair aspects is easy, whereas recalling four unfair aspects is difficult. Participants were randomly assigned to one of the two conditions. Participants were then asked to evaluate the orientation exam procedure and, as a measure of organizational attractiveness, to evaluate a university that is using such a procedure voluntarily. Finally,

personal uncertainty was assessed by means of the Labile Self-Esteem Scale (LSES; Dykman, 1998; see also De Cremer & Sedikides, 2005), a 5-item measure designed to assess the perceived instability of one's self-esteem. One example item from the LSES reads: "I'm often feeling good about myself one minute, and down the next one." (1, *not characteristic for me*; 5, *extremely characteristic for me*; Cronbach's  $\alpha = .88$ ). In line with De Cremer and Sedikides (2005), it was assumed that participants who perceive their self-esteem as fluctuating are more personally uncertain than participants who perceive their self-esteem as stable. Additionally, in order to probe for possible effects of trait self-esteem on justice judgments and information processing, Robins, Hendin, and Trzesniewski's (2001) 1-item measure for self-esteem was assessed. This item reads "In general, I have high self-esteem" (1, *do not at all agree*; 9, *agree completely*).

#### *Dependent variables*

*Procedural justice and organizational attractiveness.* Procedural justice judgments were assessed with the same three items as in Experiment 1 (Cronbach's  $\alpha = .86$ ). Organizational attractiveness was assessed with three items, reading, for example, "If somebody I know is about to decide at which university to study, I would recommend this university." (1, *do not at all agree*; 9, *completely agree*; Cronbach's  $\alpha = .89$ ).

*Ease-of-retrieval.* In Experiments 2 and 3, the manipulation check questions were assessed *following* dependent variables. This was to demonstrate that assessing the manipulation check before target variables is not a necessary precondition for individuals to rely on ease-of-retrieval experiences. Similar to Experiment 1, two items queried how easy versus difficult participants experienced the recall of aspects from memory (Cronbach's  $\alpha = .90$ ).

## Results

### *Manipulation check*

Reflecting a successful manipulation, participants recalling two aspects perceived the task as easier ( $M = 3.52$ ,  $SD = 2.03$ ) than those recalling four aspects ( $M = 2.60$ ,  $SD = 1.88$ ),  $F(1, 93) = 5.19$ ,  $p < .05$ ,  $\eta^2 = .05$ .

### *Personal uncertainty and self-esteem*

For the LSES-items assessing *personal uncertainty*, the sample mean was  $M = 2.43$  ( $SD = 0.84$ ;  $Mdn = 2.4$ ). For *self-esteem*, the sample mean was  $M = 6.07$  ( $SD = 1.71$ ;  $Mdn = 6.0$ ). The two experimental groups—recalling few versus many aspects of the exam procedure—did not reliably differ in personal uncertainty ( $M = 2.33$ ,  $SD = 0.78$ ;  $M = 2.52$ ,  $SD = 0.90$ ),  $F(1, 93) = 1.16$ , *ns.*, or in self-esteem ( $M = 6.15$ ,  $SD = 1.69$ ;  $M = 6.00$ ,  $SD = 1.74$ ),  $F < 1$ . Following suggestions by De Cremer and Sedikides (2005), self-esteem was preliminarily included in all of the subsequent analyses as a covariate to control for possible general effects of level of self-esteem. However, as no effects were found, all  $|t|s < 1$ , self-esteem was dropped from the analyses reported below.

To ensure that level of personal uncertainty had no influence on the ease or difficulty with which aspects could be retrieved from memory, a hierarchical regression analysis was conducted using the number of aspects and personal uncertainty as predictors and the z-standardized ease-of-retrieval index as criterion. Following Aiken and West (1991), personal uncertainty was z-standardized in all of the following analyses. The dummy-coded number of aspects factor (few = 0, many = 1) and the continuous personal uncertainty score were entered as predictors in Step 1, and the interaction term was entered in Step 2. Only a significant effect of number of aspects was found,  $\beta = -.24$ ,  $t(91) = -2.32$ ,  $p < .03$ ; all other  $|t|s < 1.05$ , *ns.* These results suggest that perceived ease-of-retrieval was unaffected by personal uncertainty, which is



a necessary precondition for sound inferences from results obtained with the ease-of-retrieval paradigm (Greifeneder & Bless, 2007).

### *Procedural justice*

Procedural justice judgments were averaged, z-standardized, and entered as dependent variable in a hierarchical regression analysis. Number of aspects and personal uncertainty were entered as predictors in Step 1; the interaction term was entered in Step 2. Procedural justice judgments were neither predicted by number of aspects nor by personal uncertainty,  $|t|s < 1$ . However, as expected, the interaction of personal uncertainty and number of aspects was significant,  $\beta = -.49$ ,  $t(91) = -3.26$ ,  $p < .01$ ,  $\Delta R^2 = .10$ . To further explore this interaction, simple slopes—depicted in Figure 1—were analyzed following Aiken and West (1991). For personally certain participants, one standard deviation below the mean, a positive slope emerged,  $\beta = .34$ ,  $t(91) = 2.37$ ,  $p < .03$ , indicating that the procedure was rated as less just after retrieving few compared to many unjust aspects. Presumably, this reflects reliance on ease-of-retrieval. Conversely, for personally uncertain participants, one standard deviation above the mean, a negative slope was observed,  $\beta = -.32$ ,  $t(91) = -2.26$ ,  $p < .03$ , indicating that the procedure was rated as more just after retrieving few compared to many unjust aspects. Presumably, this reflects reliance on content information. For the average rating on personal uncertainty, the slope was non-significant,  $|t| < 1$ .

### *Organizational attractiveness*

Averaged organizational attractiveness judgments were positively correlated to procedural justice,  $r = .63$ ,  $p < .01$ , z-standardized, and entered as criterion variable in the described hierarchical regression analysis. Organizational attractiveness was neither predicted by the number of aspects nor by personal uncertainty,  $|t|s < 1$ . The interaction term, however, significantly predicted organizational attractiveness,  $\beta = -.36$ ,  $t(91) = -2.32$ ,  $p < .03$ ,  $\Delta R^2 = .06$ .

Simple slope analysis suggests that personally certain participants (one standard deviation below the mean) who had to generate few aspects rated the university as less attractive than participants who had to generate many aspects,  $\beta = .31$ ,  $t(91) = 2.14$ ,  $p < .05$ , reflecting an ease-of-retrieval effect. When personal uncertainty was high, one standard deviation above the mean, there was a non-significant difference between participants who had to generate few versus many unfair aspects,  $\beta = -.17$ ,  $t(91) = -1.17$ , *ns*; for the average rating on personal uncertainty,  $|t| < 1$ .

#### *Additional analyses*

Alternatively to the suggested ease-of-retrieval explanation, one may speculate that the pattern of results observed for personally certain individuals was due to conditions differing in the quality of the retrieved aspects. To refute this speculation, two independent judges, blind to hypotheses and experimental conditions, rated each aspect's quality or compellingness (1, *low quality*; 5, *high quality*). Average interrater reliability over all four aspects was high (Cohen's  $\kappa = .87$ ). Analyses revealed that the average quality of aspects did not differ as a function of the number of aspects generated ( $M = 3.23$ ,  $SD = 1.01$  vs.  $M = 3.06$ ,  $SD = 0.94$ ),  $F < 1$ . Also, the quality of the last aspect a participant had retrieved did not differ between conditions ( $M = 3.05$ ,  $SD = 1.32$ ;  $M = 2.94$ ,  $SD = 1.32$ ),  $F < 1$ .

Similarly, using hierarchical regression analysis, we probed whether level of personal uncertainty influenced the aspects' quality. However, neither the dummy-coded number of aspects nor personal uncertainty,  $|t|s < 1$ , nor their interaction,  $\beta = -.21$ ,  $t(91) = 1.33$ , were significant predictors of average quality. Analogous results were found for the quality of the last argument. Together, these results suggest that the pattern of results observed is unlikely to be due to differences in content quality.

### *Discussion*

Experiment 2 set out to test the hypothesis that individuals' reliance on accessibility experiences when forming procedural justice judgments is moderated by dispositional personal uncertainty. It was found that personally certain individuals relied on accessibility experiences to form procedural justice judgments, whereas personally uncertain individuals relied more on accessible content information. Several aspects of these findings deserve mention. *First*, one could have argued that the ease-of-retrieval effect observed in Experiment 1 was due to assessing the manipulation check prior to dependent variables, thereby heightening the salience of accessibility experiences. To address this concern, the manipulation check was assessed *after* dependent variables in Experiment 2. As personally certain participants still displayed an ease-of-retrieval effect, it appears safe to suggest that the results observed in Experiment 1 were due neither to undue heightening of salience nor to conversational logic. This is of interest in light of recent speculations that ease-of-retrieval effects are confined to situations where the manipulation check is assessed first (Kühnen, 2010). *Second*, the results of Experiment 2 replicate those of Experiment 1 with a different procedure that pertains to participants' current life period. Arguably, because this procedure is associated with higher levels of uncertainty in the present population of university students, the general ease-of-retrieval effect observed in Experiment 1 was now confined to self-certain participants. *Third*, the obtained moderation effect—personally certain individuals relied on subjective experiences whereas personally uncertain individuals did not—extends prior research in the domains of justice and uncertainty as well as social cognition, as it allows for conclusions about when individuals are likely to rely on ease-of-retrieval in judgment (see Spencer, Zanna, & Fong, 2005, for why this is important).

### Experiment 3

The findings reported in Experiment 2 were based on participants' self-reported uncertainty and thus leave room for alternative causal explanations about the observed differences in information use. For example, other interpersonal differences related to personal uncertainty could have caused part of the effect. To strengthen and replicate the observed findings, Experiment 3 was designed to experimentally manipulate personal uncertainty (vs. certainty). This was achieved by asking participants to answer two open-ended questions about their emotions and physical sensations in different conditions. This manipulation influences the salience of uncertainty-related thoughts while presumably not eliciting affective differences between experimental groups (e.g., Van den Bos, 2001). To rule out effects of the salience manipulation on the quality of the generated aspects, the salience manipulation was instigated *after* unfair aspects were generated. If uncertainty was manipulated prior to the generation of unfair aspects, uncertainty would have affected the generation of aspects *and* reliance on retrieval experiences. The hypothesized judgmental pattern could then be due to the effects of either or even both processes, thus precluding strong conclusions about moderation (see Greifeneder & Bless, 2007).

#### *Method*

##### *Participants*

After responding to advertisement offering 1 Euro and a chocolate bar, 131 University of Mannheim students participated in an experiment labeled "Evaluation of the orientation exam." Forty-nine percent of participants were females. Participants' gender did not significantly influence control or dependent variables, neither as a main effect nor in interactions with the other two factors, and was therefore not included in the analyses. On average, participants' had studied for 4.2 semesters ( $SD = 3.2$ ) and were 22.4 years of age ( $SD = 2.9$ ). Fifty-seven percent

of participants had already passed the orientation exam.<sup>3</sup> Most likely due to the experimental setting in a university cafeteria, 33 participants did not note any unfair aspects of the orientation exam procedure and therefore had to be excluded from the analyses. The number of participants per condition after the exclusion ranged from 14 to 18. None of the significance levels reported in the following were affected by this exclusion, most likely because merely imagining to retrieve few or many instances engenders ease-of-retrieval effects, too (see Wänke, Bohner, & Jurkowitsch, 1997).

### *Design, Procedure, and Materials*

Participants were randomly assigned to a 2 (number of aspects: few vs. many) x 3 (salience: uncertainty salient vs. certainty salient vs. control) factorial design. Apart from the following modification, procedure and materials were similar to those used in Experiment 2. After retrieving either two or four unfair aspects, (un)certainly was made salient by asking participants to imagine emotions and physical sensations in a specific condition (see Van den Bos, 2001). Participants in the uncertainty (certainty) condition were asked to imagine being someone who feels uncertain (certain), and then to respond to the following two questions: "What emotions does the thought of your being uncertain (certain) about yourself arouse in you?," and "What will happen physically to you as you feel uncertain (certain) about yourself?" Participants in the control condition were asked to imagine being someone who watches TV, and then to answer the following questions: "What emotions does the thought of you watching TV arouse in you?," and "What will happen physically to you as you watch TV?".

## Results

### *Manipulation check*

The two items assessing accessibility experiences were averaged (Cronbach's  $\alpha = .88$ ). This index was entered into a 2 (number of aspects: few vs. many) x 3 (salience: uncertainty salient vs. certainty salient vs. control) ANOVA. As expected, retrieving two compared to four unfair aspects was experienced as easier ( $M = 3.05$ ,  $SD = 2.19$ ;  $M = 2.23$ ,  $SD = 1.77$ ),  $F(1, 92) = 3.96$ ,  $p < .05$ ,  $\eta^2 = .04$  (all other  $F$ s  $< 1$ ).

### *Procedural justice*

Procedural justice judgments were averaged (Cronbach's  $\alpha = .87$ ), and were entered into a 2 (number of aspects: few vs. many) x 3 (salience: uncertainty salient vs. certainty salient vs. control) ANOVA. No significant main effect of salience on procedural justice ratings was observed,  $F(2, 92) = 1.66$ ,  $ns$ , but there was a tendency for procedural justice judgments being higher after retrieving many rather than few aspects,  $F(1, 92) = 3.08$ ,  $p < .10$ ,  $\eta^2 = .03$ . This effect was qualified by the predicted significant interaction between number of aspects and salience,  $F(2, 92) = 3.25$ ,  $p < .05$ ,  $\eta^2 = .07$  (see Table 2). Replicating Experiment 2, certainty salient participants rated the procedure as less just after retrieving few rather than many aspects,  $t(92) = -3.03$ ,  $p < .01$ , reflecting reliance on ease-of-retrieval. In contrast, uncertainty salient participants displayed a non-significant tendency of evaluating the exam procedures more positively after retrieving few rather than many aspects,  $|t| < 1$ , reflecting a tendency to rely on content information. Participants in the control condition judged the procedure non-significantly more just after retrieving many compared to few aspects,  $|t| < 1$ .

### *Organizational attractiveness*

Organizational attractiveness items were averaged (Cronbach's  $\alpha = .87$ ). This index was positively related to procedural justice judgments,  $r = .61$ ,  $p < .01$  and was entered into the described ANOVA. There was no significant effect of salience on organizational attractiveness ratings,  $F < 1$ , but the organization was perceived as more attractive after recalling many ( $M = 6.57$ ,  $SD = 1.68$ ) rather than few aspects ( $M = 5.76$ ,  $SD = 1.93$ ),  $F(1, 92) = 4.34$ ,  $p < .05$ ,  $\eta^2 = .05$ . The interaction was not significant,  $F(2, 92) = 1.21$ , *ns*. Potentially, the interaction term failed to reach significance because organizational attractiveness is a more distal judgment, which is influenced via the more proximal variable of procedural justice, for which a significant effect was observed. However, planned contrasts revealed a pattern similar to that reported for procedural justice judgments: Certainty-salient participants who had to generate few aspects rated the organization as less attractive than those who had to generate many aspects,  $t(92) = -2.36$ ,  $p < .01$  (ease-of-retrieval effect). For uncertainty-salient as well as control participants, judgments of organizational attractiveness were not significantly different after retrieving few as compared to many aspects,  $|ts| < 1$ .

### *Additional analyses*

To refute alternative explanations, two independent raters, blind to hypotheses and experimental conditions, judged each aspect on a 5-point scale (1, *low quality*, to 5, *high quality*; Cohen's  $\kappa = .57$ ). The average quality of all aspects, and the quality of the last aspect, were separately entered into 2 (number of aspects: few vs. many) x 3 (salience: uncertainty salient vs. certainty salient vs. control) ANOVAs. As no significant effects emerged (all  $F_s < 1.87$ ), it appears safe to conclude that the observed pattern of results is not due to differences in quality of the retrieved aspects.

### *Discussion*

Experiment 3 substantiates the hypothesis that participants in conditions of certainty salience rely on ease-of-retrieval when forming justice judgments. Participants in conditions of uncertainty salience did not show an according pattern of results, presumably because uncertainty increases the relevance of justice concerns and careful processing of content information. In contrast to Experiment 2, the content effect in conditions of uncertainty salience was less pronounced. Potentially, this was due to the experimental setting. Whereas Experiments 1 and 2 were conducted in the laboratory, data for Experiment 3 was collected in one of the university's cafeterias. This less standardized environment may have decreased participants' compliance with experimental procedures (causing the relatively high number of participants unwilling to retrieve unfair aspects) as well as their motivation when forming judgments. As conditions of low motivation are known to foster reliance on ease-of-retrieval (e.g., Rothman & Schwarz, 1998), it appears reasonable to assume that *all* participants relied relatively more on ease-of-retrieval than participants in Experiments 1 and 2, thus attenuating potential content effects. Notably, however, this does not limit the interpretability of the observed results, because both Experiments 1 and 2 demonstrated that mainly content-based information processing in procedural justice judgments is possible under conditions where no accessibility experiences are present (readers in Experiment 1) or when individuals are dispositionally uncertain and therefore highly motivated to form accurate judgments (Experiment 2). In fact, the incomplete reversal in Experiment 3 may be interpreted as strengthening our claim that accessibility experiences play a critical role in procedural justice judgments.

### General Discussion

Justice concerns play a critical role in many domains of human life (Van den Bos & Lind, 2002). While their direct impact, as well as their influence on other important parameters such



as organizational attractiveness (e.g., Colquitt, 2001), are well recognized in the literature (for meta-analytic overviews, see Cohen-Charash & Spector, 2001; Colquitt et al., 2001), much less is known about *how* procedural justice judgments are formed. To date, most conceptions define content information, such as characteristics of the procedure (Folger, 1977), as the main source of judgment relevant information. Extending this perspective, three experiments revealed that individuals may also rely on accessibility experiences to form justice judgments. Across experiments, participants evaluated procedures as more just after recalling many rather than few unfair aspects, presumably because the experienced difficulty associated with recalling many aspects implied that there are only few unfair aspects to the procedure, whereas the experienced ease associated with recalling few aspects implied that there are many unfair aspects.

Several aspects of these findings deserve high-lighting. First, the ease-of-retrieval pattern replicated across samples and target procedures, thus speaking to the general nature of the reported effect.

Second, the ease-of-retrieval effect was independent of whether the manipulation check was assessed prior to (Experiment 1) or after (Experiments 2 and 3) the dependent variables, suggesting that ease-of-retrieval effects are not limited to situations in which the salience of accessibility experiences has been experimentally heightened. This finding qualifies the recent claim that ease-of-retrieval effects are confined to situations when the manipulation check is assessed first (Kühnen, 2010). Although speculative, it would appear that the mere positioning of the manipulation check is not primary. Future research may fruitfully look at the processes underlying the repositioning of manipulation checks, such as the ensuing salience of cognitive feelings (e.g., Hansen & Wänke, 2008).

Third, in Experiments 2 and 3, the hypothesized effects did not reliably differ for participants who had already passed the respective target procedures compared to those who had not. The influence of accessibility experiences on procedural justice judgments is thus

unlikely to be limited to procedures that have already been completed and lie in the past, but applies to procedures individuals are still experiencing, too. However, it would appear that the less uncertainty arousing a procedure is (e.g., because it pertains to a previous life period, as in Experiment 1), the more ease-of-retrieval experiences are relied upon.

Fourth, in addition to showing that procedural justice judgments *can* be influenced by ease-of-retrieval, the present contribution offers deeper insight as to *when* this source of information is relied upon. Building on current models of uncertainty management (e.g., Van den Bos & Lind, 2002) and dual-process theories of attitude and judgment formation (e.g., Chen & Chaiken, 1999), it was hypothesized and found that habitually certain participants as well as participants to whom personal certainty had been made salient relied more on their experiences of ease or difficulty than participants in conditions of personal uncertainty. Presumably, this was because individuals in conditions of personal uncertainty were more motivated to form accurate justice judgments in order to reduce this uncertainty, as suggested by the uncertainty management model, and therefore engaged in more systematic processing of content information. In contrast, for individuals in conditions of personal certainty, careful processing of content information may have been less relevant and internal cues safe to rely on, resulting in more pronounced influence of ease-of-retrieval.

Finally, the present findings complement and add to research in the realm of cooperation behavior, which observed that accessibility experiences influence social interaction behavior in conditions of personal certainty (Müller et al., 2010). This correspondence is noteworthy because it suggests that similar mechanisms may inform judgment formation and behavior regulation. Moreover, it may indicate that accessibility experiences are perceived as informative for both highly complex social interactions (multi-round principal agent games) and presumably less complex evaluative targets (admission and exam procedures). And it suggests that accessibility experiences are informative in many different domains, for which justice considerations may be more or less salient, thus attesting to the findings' generalizability. The

present results thus strongly extend earlier findings (Müller et al., 2010), which were limited to a particular behavioral manifestation, while being silent about other critical aspects in justice research.

Going beyond the observed evidence, at least four theoretical considerations appear noteworthy. First, it is interesting to note that the present ease-of-retrieval hypothesis corresponds to norm theory (Kahneman & Miller, 1986). Norm theory—which bears many similarities with current models of justice judgment formation—assumes that the weights of different counterfactual elements are determined by their availability (accessibility). Since norms and deviations from norms are integral parts of justice perceptions, it would appear that accessibility experiences play a vital role in the formation of procedural justice judgments, too, as demonstrated in the present contribution.

Second, with respect to the literature on uncertainty, the present findings suggest that uncertainty or uncertainty-related states not only cause stronger reactions to just or unjust events (e.g., De Cremer & Sedikides, 2005), but may also trigger differential reliance on available information sources. To date, such a moderating influence is not a common part in models conceptualizing the impact of uncertainty (or related approaches, such as fairness heuristic theory, e.g., Van den Bos, Lind, & Wilke, 2001), and therefore suggests intriguing venues for future research.

Interestingly, the finding that ease-of-retrieval is relied on in conditions of personal certainty may appear to clash with the work on “judgments under uncertainty” (Tversky & Kahneman, 1974), which holds that uncertainty fosters the use of heuristics or short-cuts. Yet, this contradiction is not really genuine, because the opposing perspectives integrate very well if one looks more closely at the different types of uncertainty investigated. The present contribution focused on *personal uncertainty*. In contrast, prior work in the domain of decision making often focused on uncertainty resulting from ambiguity or a lack of information, which has been referred to as *informational uncertainty* and is characterized by incomplete information

(see Van den Bos & Lind, 2009). With *informational* uncertainty, content information is likely perceived as undiagnostic, and individuals may recur to other, apparently unrelated sources of information, like ease-of-retrieval or affective feelings (Van den Bos, 2003). In conditions of *personal* uncertainty, however, individuals may not harbor doubts about the validity of retrieved content information, because the experienced uncertainty is not related to the informational basis. Systematic or careful processing of content information is therefore likely for conditions of personal uncertainty, as observed in the present experiments.

Third, the present findings are of interest in light of earlier evidence suggesting that individuals react more strongly to stimuli perceived as fair versus unfair in conditions of uncertainty (e.g., Van den Bos, 2001). From this earlier evidence, one may venture the hypothesis that accessibility experiences—which we showed to be relied upon in conditions of personal certainty—rarely come to play. However, because earlier research focused on *reactions* to events already judged as just versus unjust, whereas the present findings focus on how these justice judgments are formed, such conclusions are not self-evident. In contrast, there is another possibility, which is more akin to the causal order of the formation of, and subsequent reactions to, justice judgments. Specifically, we speculate that affective reactions to stimuli judged as fair versus unfair may be less strong when these judgments were formed on the basis of accessibility experiences. This is because conditions of certainty foster reliance on accessibility experiences, but presumably result in less strong affective reactions to these judgments. Unfortunately, the present findings do not allow for answering this interesting question, but trace the path for future work on the role and consequences of uncertainty.

Finally, with respect to the literature on ease-of-retrieval, the present moderation finding allows for further insight as to when or how often individuals rely on ease-of-retrieval in judgment formation. Intriguingly, since individuals are motivated to reduce uncertainty, one may speculate that states of certainty are more common than states of uncertainty, which in turn allows for the

conclusion that reliance on accessibility experiences in judgment formation is a common judgmental pathway, perhaps more common than systematic integration of content information.

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## Footnotes

- <sup>1</sup> Only male participants were invited to take part in Experiments 1 and 2. A mixed sample was invited for Experiment 3.
- <sup>2</sup> Participants' examination status did not significantly influence procedural justice judgments or organizational attractiveness, neither as a main effect nor in interactions with the other two factors. Accordingly, exam status was not included in the reported analyses. The fact that exam status did not influence the observed findings may appear surprising at first glance, because one might suspect that a procedure triggers less uncertainty in those who have successfully passed it. However, the particular procedure chosen in the present experiment—the orientation exam—still pertains to students' current life period (with an uncertain outcome) and may still decide about the fate of close friends. It is therefore likely to be associated with uncertainty even for students who have successfully passed it.
- <sup>3</sup> Participants who had already passed the orientation exam rated the procedure as more just ( $M = 6.22$ ,  $SD = 1.87$ ) than participants who had not passed the exam yet ( $M = 4.65$ ,  $SD = 2.07$ ),  $F(1, 83) = 12.47$ ,  $p < .01$ . Participants who had already passed the orientation exam also rated the university as more attractive ( $M = 6.57$ ,  $SD = 1.82$ ) than participants who had not yet passed the exam ( $M = 5.62$ ,  $SD = 1.78$ ),  $F(1, 83) = 6.03$ ,  $p < .05$ . However, examination status did not significantly interact with the experimental manipulations and did not change the statistical significance of the results reported for procedural justice and organizational attractiveness. Therefore, the factor was not included in the reported analyses.

## Tables

Table 1

*Means (with Standard Deviations) of Procedural Justice Judgments and Attitude toward the ZVS as a Function of Task and Number of Aspects in Experiment 1.*

Task	Number of aspects	
	Few	Many
	Procedural justice	
Writing	2.73 (1.12)	4.50 (1.86)
Reading	5.20 (1.59)	3.64 (2.45)
	Attitude toward the ZVS	
Writing	2.88 (1.38)	4.44 (1.89)
Reading	5.23 (2.25)	3.25 (2.39)

*Notes.* Means are on 9-point scales, higher values indicate higher levels of procedural justice or attitude toward the ZVS.

Table 2

*Means (with Standard Deviations) of Procedural Justice Judgments and Organizational Attractiveness as a Function of Salience and Number of Aspects in Experiment 3.*

Salience	Number of aspects	
	Few	Many
	Procedural justice	
Uncertainty	6.33 (1.16)	5.90 (1.79)
Certainty	4.37 (2.26)	6.41 (1.72)
Television	5.02 (2.30)	5.53 (2.35)
	Organizational attractiveness	
Uncertainty	6.38 (1.62)	6.57 (1.62)
Certainty	5.20 (1.92)	6.72 (1.90)
Television	5.82 (2.10)	6.40 (1.52)

*Notes.* Means are on 9-point scales, higher values indicate higher levels of procedural justice or organizational attractiveness.

Figure Caption

*Figure 1.* Procedural justice judgments (z-standardized) as a function of number of aspects and personal (un)certainty in Experiment 2. Higher values indicate higher levels of procedural justice judgments.



