Does Injustice Reduce Cognitive Performance? An Experimental Test

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Recibido 14 de marzo de 2016

Aceptado: Oct 12 de 2016

ABSTRACT

In this paper we report two experimental studies showing for the first time that injustice causes a reduction in cognitive performance in complex tasks. The two experiments (Study 1, N = 106, Study 2, N = 90) used two different paradigms. In Study 1 participants were exposed to injustice happening to other people. In Study 2 participants themselves were the targets of injustice. In both studies the dependent variable was cognitive performance in a complex task. Specifically, in Study 1 participants solved anagrams, and in Study 2 they solved several Raven matrices. The dependent measures were the number of anagrams and Raven matrices solved correctly. We found that cognitive performance was worse in the unjust condition compared to the just condition (i.e., fewer items solved correctly). These results imply that unfairness in everyday life may have a deleterious effect on individuals' capacity to think in a complex way. Possible mediators for this effect are proposed.

KEYWORDS: cognitive performance, experiment, injustice, justice.

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ACKNOWLEDGEMENTS

The authors declare that there are no potential conflicts of interest with respect to the research, authorship, and/or publication of this article

Funding: This work received no funding.

Perceiving people and events in our lives as just is related with being happy and rule-abiding citizens (Dalbert, 2001; Lerner, 1980). Indeed, research has consistently shown that lower judgments of justice are associated with lower job satisfaction, lower legitimation of authorities, fewer organizational citizenship behaviors, worse work performance, and more counter-productive work behaviours (for a meta-analysis, see Cohen-Charash & Spector, 2001). These associations have been found in research on the distribution of resources (distributive justice, e.g., Adams, 1965), the procedures by which the outcomes are assigned (procedural justice, e.g., Thibaut & Walker, 1975), or the quality of treatment received (interactional justice, Bies & Moag, 1986; Bies & Shapiro, 1987). More recently, large epidemiological studies found that low perceptions of justice are associated with serious physical and psychological health problems (e.g., De Vogli, Ferrie, & Chandola, Kivimäki, & Marmot, 2007; for a review, see Elovainio et al., 2012).

There is thus an impressive body of evidence *associating* (in)justice with diverse phenomena, including cognitive performance. Nevertheless, to our knowledge at least, research has not addressed an important question yet: does injustice *cause* a reduction in cognitive performance? In the research we report here our main goal was to give a first contribution towards an answer to this question. Although a causal link between injustice and cognitive performance reduction has not been tested yet, theoretical conceptualizations and one empirical study support that possibility.

Indeed, in a prospective study using more than 4500 middle-aged employed men and women, Elovaino et al. (2012) recently found that injustice is associated with a decrease in cognitive function across a 20-year period. Specifically, the perception of lower organizational justice predicted worse scores in memory, inductive reasoning, and tests of vocabulary, phonemic and semantic fluency. These associations were independent of age, health-related behaviours, depressive symptoms, hypertension or job strain. However, since

that study was correlational, it did not unequivocally establish a causal relation between organizational justice and cognitive function for several reasons. First, as Elovainio et al. (2012) stated, it is also possible to think that the relation between injustice and cognitive function is reverse caused: people with lower versus higher cognitive skills would perform worse at work. In turn, this would cause more criticism and conflicts with colleagues and supervisors, which would induce higher perception of injustice. Closely related to this, it is possible that a third variable not considered in that research may cause the association between injustice and cognitive function. Finally, participants in Elovainio et al.'s (2012) research responded to a measure of perceived organizational (in)justice, not to actual injustice.

Theoretically, three conceptual lines could explain why injustice causes a decrease in cognitive performance. A first possibility could be psychological stress, as suggested by Elovaino et al. (2012): injustice causes psychological stress (Elovainio, Kivimäki, & Vahtera, 2002), and psychological stress may affect cognitive function (Lupien, Maheu, Tu, Fiocco, & Schramek, 2007). A related possibility could be arousal in the form of negative emotions. According to this explanation, injustice causes negative emotions (Dalbert, 2002; Mikula, Scherer, & Athenstaedt, 1998) and, as it is well-known, arousal facilitates simple tasks but impairs complex tasks (Zajonc, 1965).

A second possible mechanism could be that individuals exposed to injustice have fewer cognitive resources available to solve tasks. Indeed, witnessing or being targets of injustice threatens one's fundamental need to perceive the world as a just place (Lerner, 1980). In the process of defending such fundamental perception individuals can be expected to consume cognitive resources and to exert less self-regulation (Laurin, Fitzsimons, & Kay, 2011). As a result of this consumption of the self's executive resources, it is likely that cognitive performance is impaired.

A third possible mechanism, related to the self-validation approach, may be that injustice reduces people reliance on their judgements (Petty, Briñol, & Tormala, 2002; Santos & Rivera, 2015).

This paper reports two experimental studies aiming to investigate whether injustice leads to a reduction in cognitive performance in complex tasks. In these studies we manipulated (in)justice and measured cognitive performance. We used two different paradigms to manipulate the experience of injustice. Indeed, people react more strongly to injustice happening to them than to other people (van Prooijen, 2008). Thus, in Study 1 participants were exposed to injustice happening to other people. Nevertheless, research has also shown that people are also affected by injustice that happens to other people (Correia, Vala, & Aguiar, 2007), especially if the target of injustice is an ingroup member (Aguiar, Vala, Correia, & Pereira, 2008). In Study 2 participants themselves were targets of injustice. In both studies the dependent variable was cognitive performance in a complex task. Specifically, in Study 1 participants solved anagrams, and in Study 2 they solved several matrices taken from the Raven Matrices (Raven, Raven, & Court, 2000). The dependent measures were the number of anagrams and Raven matrices solved correctly.

STUDY 1

Method

Participants and Design

One hundred and six students[1] (61 females and 45 males) from grades 10 to 12 participated in this study: 10th grade (n = 34), 11th grade (n = 39), 12th grade (n = 33). Their

[1] Before starting collecting data, we had decided to have 30 participants in the two experimental conditions so that we could assume their normal distributions (this was also the case of Study 2). In Study 1 there are more than 30 participants in each condition simply

ages varied between 14 and 20 years (M = 16.27; SD = 1.09) Participants were randomly assigned to two different conditions (just condition and unjust condition; n's = 49 and 57, respectively). We did not exclude any participants from analyses. We report all experimental conditions and dependent measures used in the study.

Variables and Procedure

We obtained authorization from the school boards to administer the questionnaire and requested permission from the parents of the students who participated in the study. It was stressed that participation was anonymous and voluntary.

Students were invited to participate in a study about school life and completed the questionnaires during class time (around 15 minutes). Participants in both conditions read a similar episode that only differed in the way a teacher treated two students in terms of procedural, distributive and interactional (in)justice. Specifically, participants in both conditions read that one student accidentally dropped a pen onto the floor while he was taking a decisive written test. Another student, who was sitting next to him, took the pen off the floor and, while he was giving it back to its owner, the teacher approached the students. Suspecting that something fishy had happened, the teacher took the tests away from them. In the *just condition* participants read that the students were able to explain what had happened, the teacher listened carefully to them, believed them and returned the written tests so that the students could finish answering them. In the *unjust condition* participants read that the students were not able to explain what had happened because the teacher did not want to

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because data were collected during classes with a varying number of students. In Study 2, however, this could be controlled, because data collection was done individually. That is why the number of participants in this study is higher than that in Study 2, despite the fact that the latter comprises three experimental conditions.

listen to their explanations, accused them of cheating, and decided the students would not score in that test. This decision, which would have negative consequences for the students' grades, was backed up by the school's principal.

After reading the vignette, participants were asked to evaluate the justice of the situation on a one-item scale from 1 (Not at all) to 7 (A lot) scale. They were next presented a list of 26 anagrams and told to solve as many as they could in 2 minutes. The dependent variable was the number of anagrams solved correctly.

At the end participants were debriefed and thanked for taking part in the study.

Results and Discussion

The manipulation check showed that participants perceived the situation in the just condition as more just (M = 5.67, SD = 1.38) than the situation in the unjust condition (M = 1.81, SD = 1.16; $t(104) = -15.52$, $p < .001$, $d = 3.03$). An independent samples t-test showed that the number of anagrams solved correctly was lower in the unjust condition (M = 8.58, SD = 2.69) than in the just condition (M = 9.63, SD = 2.64; $t(104) = -2.03$, $p = .045$, $d = 0.39$)[2].

[2] As suggested by an anonymous reviewer, we conducted an ANCOVA controlling for participant age, and a bootstrapped mediation analysis (Process Model 4, 10,000 resamples, Hayes, 2013) with the manipulation check (perceived injustice) as the mediator. As regards the ANCOVA, the results did not change. Indeed, the effect of age on the number anagrams solved correctly was nonsignificant $F(1, 103) = 1.41$, $p = .24$, $\eta_p^2 = .01$, and the effect of (in)justice manipulation remained significant, $F(1, 103) = 3.90$, $p = .051$, $\eta_p^2 = .04$. The mediation analysis indicated that perceived (in)justice did not mediate between manipulated (in)justice and the number of anagrams solved correctly, point estimate = 0.40, 95% CI = [-0.66, 1.33].

Our results thus support the hypothesis that injustice reduces cognitive performance. Nevertheless, this study does not allow us to know whether, compared to a justice neutral condition, cognitive performance decreases in the unjust condition and/or increases in the just condition. The next study will allow us to answer this question.

STUDY 2

This study had the same goal as the previous one but three differences were introduced. First, we included a control condition which referred to neither justice nor injustice issues. This condition allowed us to test whether cognitive performance decreases in the unjust condition or increases in the just condition. Second, we used the Raven matrices to measure participants' cognitive performance. These matrices have already been used to measure consumption of mental resources after manipulations of exposition to experimental threat, such as poverty (Mani, Mullainathan, Shafir, & Zhao, 2013). Finally, the participants themselves were the targets of injustice instead of being exposed to injustice happening to other people, as had been the case in Study 1.

Method

Participants

Ninety university students (34 males and 56 females) aged between 18 and 52 years (M = 22.66, DP = 5.97) took part in this study. Participants were randomly assigned to one of three different conditions (just, control, or unjust; all n’s = 30).

We did not exclude any participants from analyses. We report all experimental conditions and dependent measures used in the study.

All procedures were conducted according to the ethical guidelines and approved by the Direction of the Social Psychology Laboratory at our university.

Design and variables

Participants, invited to take part in a study about performance, were tested individually. After having accepted to participate, they signed an informed consent form. Participants were randomly assigned to one of three different conditions (just, control, or unjust). In the just and unjust conditions participants were invited to choose a task (crossword or alphabet soup) and were told they would be given points and rewards, operationalized as candy, according to their performance. In the just condition participants were assigned to the task they had chosen, got the promised number of points and candies, and solved the task in the time initially indicated (8 minutes). In the unjust condition they were assigned the task they had not chosen, got half the points promised and no candies, and had to solve the task in half the time initially indicated (i.e., in 4 minutes). In the control condition the experimenter simply gave participants one of the tasks without mentioning there was another. They were neither promised nor given any points or candy and solved the task in the time initially indicated (8 minutes). In all conditions participants were not allowed to eat the candies before the end of the experiment.

Participants were next presented with 14 matrices taken from Raven et al. (2000), aimed to measure their cognitive performance. Each of these matrices involves a sequence of shapes with one shape missing. Participants must choose which of several alternatives best fits in the missing space. In our study all participants in all conditions were told they would have a maximum of three minutes to complete the matrices. Contrary to what had happened in the task that manipulated (in)justice, participants in all conditions were actually given the time indicated to complete the matrices. The dependent variable was the number of matrices solved correctly. Finally, participants were asked to evaluate on a one-item scale whether the experimenter had been just (1 = Completely Disagree; 7 = Completely Agree). Participation took about 30 minutes and each participant was debriefed and thanked at the end of their session.

Results and Discussion

A One-Way ANOVA showed a significant effect of experimental condition on the perception of experimenter justice, $F(2, 87) = 19.67$, $p < .001$, $\eta_p^2 = .31$. Tukey HSD post-hoc tests showed that participantes in the unjust condition evaluated the experimenter as less just ($M = 4.30$, $SD = 2.07$) than in the control ($M = 6.20$, $SD = 1.35$) and just conditions ($M = 6.57$, $SD = 0.82$; both ps $< .001$). Nevertheless, judgements in the control condition did not significantly differ from those in the just condition ($p = .61$). Another One-Way ANOVA indicated that the number of matrices solved correctly differed according to experimental conditions, $F(2, 87) = 3.37$, $p = .039$, $\eta_p^2 = .07$[3]. Participants in the unjust condition completed fewer matrices correctly ($M = 2.73$; $SD = 1.82$) than participants in the just condition ($M = 4.20$; $SD = 2.44$), $F(1, 87) = 6.03$, $p = .02$, $\eta_p^2 = .07$, and the control condition ($M = 3.90$; $SD = 2.60$), $F(1, 87) = 3.82$, $p = .054$, $\eta_p^2 = .04$. The number of matrices completed correctly in the just and the control conditions did not differ significantly, $F(1, 87) = 0.25$, $p = .62$, $\eta_p^2 = .003$.

[3] As suggested by an anonymous reviewer we conducted an ANCOVA controlling for participant age, and a boostrapped mediation analysis with the manipulation check (perceived injustice) as the mediator. As regards the ANCOVA, the results did not change. Indeed, the effect of age was nonsignificant $F(1, 86) = 0.22$, $p = .64$, $\eta_p^2 = .003$, and the effect of (in)justice manipulation remained significant, $F(1, 86) = 3.36$, $p = .04$, $\eta_p^2 = .07$.
The mediation analysis indicated that perceived (in)justice did not mediate between manipulated (in)justice and number of anagrams solved correctly, point estimate = -0.11, 95% CI = [-0.44, 0.21].

Furthermore, a planned contrast comparing the unjust condition against both the just and the control conditions (+2 -1 -1) showed that participants in the unjust condition completed fewer matrices correctly (M = 2.73, SD = 1.82) than participants in the just condition (M = 4.20, SD = 2.44) and those in the control condition (M = 3.90, SD = 2.60), $F(1, 87) = 6.48$, $p = .01$, $\eta_p^2 = .07$.

Using another manipulation of (in)justice and a different measure of complex cognitive performance, we again observed a lower cognitive performance in the unjust condition compared to the just condition. Furthermore, cognitive performance of participants in the control condition was equivalent to that of participants in the just condition and higher than that of participants in the unjust condition. This indicates that the difference in cognitive performance between participants in the unjust and the just conditions stems from a decrease in the former case situation, not from an increase in the latter.

GENERAL DISCUSSION

With these two studies we intended to investigate whether injustice impairs performance in cognitive complex tasks. In two experiments, using two different paradigms and two different measures of cognitive performance, we predicted and found that cognitive performance was worse when participants had been exposed to injustice compared to justice.

This is in line with and extends previous results of a prospective study by Elovaino et al. (2012) which found that injustice predicted cognitive function in a sample of middle-aged people. Expanding on these results we further found that: 1) there is a causal relation (and not a mere association) between injustice and decrease in cognitive performance; 2) this causal relation occurs after a short-term exposure (and not only after a long-term exposure); 3) this happens in two age groups: students from high school and university students; and 4) the

decrease in cognitive performance occurs either when individuals themselves are targets of injustice or they "merely" observe injustice happening to other people.

The latter point is in line with theorizing and research pointing to the fact that people are negatively affected both when they and, to a lesser extent, other people are targets of injustice, provided these other people are inside their scope of justice (Lima-Nunes, Pereira, & Correia, 2013; Opotow, 1990, 1995).

We hope that our findings will contribute to stimulate further research aiming to explain the processes through which injustice decreases cognitive performance. As already mentioned, we can suggest several possible mediational mechanisms: arousal, consumption of cognitive resources, reduction in thought reliance, and learned helplessness.

If arousal induced by injustice is a mediator, we expect it will impair complex tasks, as is the case of those in our studies, whilst it will facilitate simple tasks (see Zajonc, 1965). Arousal may be provoked simply by distress or by sheer anger towards the experimenter. In either case these should derive from the fact that in the unjust condition the announced rules announced were not respected.

Another possible mediator could be a higher consumption of cognitive resources produced by injustice to defend the need to perceive the world as a just place. This would be similar to what happens with the threat to another fundamental need - the need to belong (Baumeister, Twenge, & Nuss, 2002). According to Baumeister et al. (2002), people suppress emotion in order to face the threat to their need to belong. Since emotion supression is part of the self-regulation system (Muraven, Tice, & Baumeister, 1998), resources of the self become less available for controlled and complex cognitive processes, whilst the more automatic cognitive processes continue to operate in a relatively unimpaired fashion. Research could thus test experimentally whether ego depletion (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Inzlicht & Schmeichel, 2012) mediates between injustice and cognitive performance.

Finally, if the reduction of cognitive performance occurs as a consequence of people relying less on their thoughts, then after witnessing or being exposed to injustice, individuals can be expected to be equally persuaded by strong and weak arguments. On the contrary, after witnessing or being exposed to justice, individuals can be expected to be more persuaded by strong than by weak arguments (Briñol & Petty, 2009; Petty et al., 2002).

As one anonymous reviewer suggested, there could be a possible fourth explanation for the reduction of performance in Study 2. Indeed, the fact that we operationalized injustice by having the experimenter not respecting the rules could have led participants to not feel motivated to give their best while performing the task. However, as in both studies of this paper the results were the same, but only in Study 2 did the experimenter not respect the rules, this lack of motivation account seems as less plausible to us (but worthwhile testing).

The same anonymous reviewer also suggested an additional possible explanation. According to him/her, the reduction in time used to manipulate injustice could have induced learned helplessness in the participants: they could have thought that if the first task was so difficult, the second would also be difficult and it would not be worth giving their best at it.

The studies included in this paper support the idea that there is a causal relation between injustice (witnessed and experienced) and a decrease in cognitive performance. This allows us to expect that in situations where people face injustice, be it in society at large, at work or at school, their cognitive performance will most probably be affected negatively. Indeed, research in other domains has already found that the perception of injustice is associated with fewer positive work behaviors (Cohen-Charash & Spector, 2001) and fewer group-oriented attitudes and behaviors (Tyler, Degoey, & Smith, 1996). Our results go a step further by suggesting those findings may be due to less complex thought.

In the studies reported in this paper, we manipulated distributive, procedural and interactional (in)justice simultaneously. Future studies should also compare the effects of

these different (in)justice types on the reduction of cognitive performance and their possible cumulative effect. Future studies should also investigate whether the cognitive performance of perpetrators of injustice is also impaired.

By establishing a causal relation between injustice and a decrease in cognitive performance, we hope our results contribute to the promotion of fair environments and relations that do not impair the intellectual functioning of individuals.

REFERENCES

Adams, J. S. (1965). Inequity in social exchange. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol.2, pp. 267-299). Academic Press, New York.

Aguiar, P., Vala, J., Correia, I., & Pereira, C. (2008). Justice in our world and in other's world: Belief in a just world and reactions to victims. *Social Justice Research, 21,* 50-68. doi: 10.1007/s11211-007-0059-3

Baumeister, R. F., Bratslavsky, E., Muraven, M., & Tice, D. M. (1998). Ego depletion: Is the active self a limited resource? *Journal of Personality and Social Psychology*, *74,* 1252–1265.doi:10.1037/0022-3514.74.5.1252

Baumeister, R. F., Twenge, J. M., & Nuss, C. K. (2002). Effects of social exclusion on cognitive processes: Anticipated aloneness reduces intelligent thought. *Journal of Personality and Social Psychology*, *83*, 817-827. doi: 10.1037//0022-3514.83.4.817

Bies, R. J., & Moag, J. S. (1986). Interactional justice: Communication criteria for fairness. In B. H. Sheppard (Ed.), *Research on negotiation in organizations* (Vol. 1, pp. 43-44). Greenwich, CT: JAI Press.

Bies, R. J., & Shapiro, D. L. (1987). Interactional fairness judgments: The influence of causal accounts. *Social Justice Research, 1,* 199- 218. Doi: 10.1007/BF01048016

Briñol, P., & Petty, R. E. (2009). Source factors in persuasion: A self-validation approach. *European Review of Social Psychology, 20*, 49-96. Doi: 10.1080/10463280802643640

Cohen-Charash, Y., & Spector, P. E. (2001). The role of justice in organizations: A metaanalysis. *Organizational Behavior and Human Decision Processes, 86*, 278-321. doi: 10.1006/obdh.2001.2958

Correia, I., Vala, J., & Aguiar, P. (2007). Victim's innocence, social categorization and the threat to the belief in a just world. *Journal of Experimental Social Psychology, 43*, 31-38. Doi: 10.1016/j.jesp.2005.12.010

Dalbert, C. (2001). *The justice motive as a personal resource: Dealing with challenges and critical life events*. New York: Plenum Publishers.

Dalbert, C. (2002). Beliefs in a just world as a buffer against anger. *Social Justice Research, 15*, 123-145. doi: 10.1023/A:1019919822628

De Vogli, R., Ferrie, J. E., Chandola, T., Kivimäki, M., & Marmot, M. G. (2007). Unfairness and health: Evidence from the Whitehall II Study. *Journal of Epidemiology and Community Health, 61*, 513-518. doi:10.1136/jech.2006.052563

Elovainio, M., Kivimäki, M., & Vahtera, J. (2002). Organizational justice: Evidence of a new psychosocial predictor of health. *American Journal of Public Health, 92*, 105–108.

Elovainio, M., Singh-Manoux, A., Ferrie, J.E., Shipley, M., Gimeno, D., De Vogli, R., Vahtera, J., Virtanen, M., Jokela, M., Marmot, M. G., & Kivimäki, M. (2012). Organisational justice and cognitive function in middle-aged employees: The Whitehall II study. *Journal of Epidemiology and Community Health, 66*, 552-556. doi: 10.1136/jech.2010.113407.

Inzlicht, M., & Schmeichel, B. J. (2012). What is ego depletion? Toward a mechanistic revision of the resource model of self-control. *Perspectives on Psychological Science, 7*, 450-463. doi:10.1177/1745691612454134

Laurin, K., Fitzsimons, G. M., & Kay, A. C. (2011). Social disadvantage and the self-regulatory function of justice beliefs. *Journal of Personality and Social Psychology, 100,* 149-171. doi: 10.1037/a0021343

Lerner, M. J. (1980). *The belief in a just world: A fundamental delusion*. New York: Plenum Press.

Lima-Nunes, A., Pereira, C. R., & Correia, I. (2013). Restricting the scope of justice to justify discrimination: The role played by justice perceptions in discrimination against immigrants. *European Journal of Social Psychology, 43,* 627-636. doi: 10.1002/ejsp.1981

Lupien, S., Maheu, F., Tu, M., Fiocco, A., & Schramek, T.E. (2007). The effects of stress and stress hormones on human cognition: Implications for the field of brain and cognition. *Brain Cognition*, *65*, 209-237. Doi: 10.1016/j.bandc.2007.02.007

Mani, A., Mullainathan, S., Shafir, E., & Zhao, J. (2013). Poverty impedes cognitive function. *Science, 341*, 976-980. doi: 10.1126/science.1238041

Mikula, G., Scherer, K. R., & Athenstaedt, U. (1998). The role of injustice in the elicitation of differential emotional reactions. *Personality and Social Psychology Bulletin*, *24*, 769-783. doi: 10.1177/0146167298247009

Muraven, M., Tice, D. M., & Baumeister, R. F. (1998). Self-control as limited resource: Regulatory depletion patterns. *Journal of Personality and Social Psychology, 74*, 774-789. doi: 10.1037/0022-3514.74.3.774

Opotow, S. (1990). Moral exclusion and injustice: An introduction. *Journal of Social Issues, 46*, 1–20. Doi: 10.1111/j.1540-4560.1990.tb00268.x

Opotow, S. (1995). Drawing the line: Social categorization, moral exclusion, and the scope of justice. In B. B. Bunker, & J. Z. Rubin (Eds.), *Conflict, cooperation, and justice* (pp. 347–369). San Francisco: Jossey-Bass.

Petty, R. E., Briñol, P., & Tormala, Z. L. (2002). Thought confidence as a determinant of persuasion: The self-validation hypothesis. *Journal of Personality and Social Psychology, 82,* 722-741. Doi: 10.1037//0022-3514.82.5.722

Raven, J., Raven, J. C., & Court, J. H. (2000, updated 2004). *Manual for Raven's Progressive Matrices and Vocabulary Scales. Section 3: The Standard Progressive Matrices*. San Antonio, TX: Harcourt Assessment.

Santos, D., & Rivera, R. (2015). The accessibility of justice-related concepts can validate intentions to punish. *Social Influence, 10*, 180-192. Doi: 10.1080/15534510.2015.1031170

Thibaut, J., & Walker, L. (1975). *Procedural justice: Psychological analysis*. Hillsdale, NJ: Lawrence Earlbaum.

Tyler, T., Degoey, P., & Smith, H. (1996). Understanding why the justice of group procedures matters: A test of the psychological dynamics of the group-value model. *Journal of Personality and Social Psychology, 70*, 913-930. Doi: 10.1037/0022-3514.70.5.913

van Prooijen, J.-W. (2008). Egocentrism in procedural justice effects. In K. Hegtvedt, & J. Clay-Warner (Eds.), *Advances in group processes: Justice* (Vol. 25; pp. 29-54). Bingley, UK: JAI press.

Zajonc, R. B. (1965). Social facilitation. *Science, 149*, 269–274. Doi: 10.1126/science.149.3681.269