Organizational Neuroscience

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ORGANIZATIONAL JUSTICE THROUGH THE WINDOW OF NEUROSCIENCE

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ABSTRACT

This chapter advocates the use of neuroscience theoretical insights and methodological tools to advance existing organizational justice theory, research, and practice. To illustrate the value of neuroscience, two general topics are reviewed. In regard to individual justice, neuroscience makes it clear that organizational justice theory and research needs to integrate both emotion and cognition. Neuroscience also suggests promising avenues for practical individual justice interventions. For other-focused justice, neuroscience clarifies how empathy provides a mechanism for deontic justice while again highlighting the need to consider both emotion and cognition. Neuroscience research into group characterizations also suggests promising explanations for deontic justice failures. We also show how other-focused justice interventions are possible, but more complex, than for self-focused justice. We conclude that interdisciplinary research has great potential to advance both organizational justice and neuroscience research.

Keywords: Neuroscience; self-focused justice; other-focused justice; emotion; empathy

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In recent years, interest in organizational neuroscience (ONS) has grown as organizational scholars have begun to capitalize on advances made in various fields of neuroscience research (Becker, Cropanzano, & Sanfey, 2011). Organizational justice represents a particularly fertile area for integrating neuroscience because its fundamental underpinnings cut across many related fields and include areas of interest to basic science research (Becker & Cropanzano, 2010). In fact, scholars have already proposed preliminary models of neuro-organizational justice (Beugré, 2009; Salvador & Folger, 2009). We believe, however, that rather than attempting to create new neuroscience-based models of organizational justice, ONS can be also proficiently applied to organizational science and practice by integrating its insights and methods into existing models. For that reason, in this chapter, we promote a broader view of how neuroscience can be incorporated into organizational justice research. To that end, we explore two general topics and outline how neuroscience research influences it in terms of theory, methods, and practice.

While there are many topics within organizational justice that will be impacted by neuroscience, we chose two to explore here: (1) the balance between emotion and cognition in self-focused justice; and (2) how neuroscience informs other-focused, deontic justice. We selected these topics because they involve fundamental principles of organizational justice that also have important practical implications. In addition, there are well-developed streams of neuroscience research that can inform both of these topics.

SELF-FOCUSED JUSTICE

In organizational research, justice and morality have often been closely related and sometimes equated with each other (for a review on the differences, see Cropanzano, Byrne, Bobocel, & Rupp, 2001). Here, we focus specifically on justice, while the chapter "Neuroscience of moral cognition and conation in organizations" in this book covers the neuroscience perspective on ethical behavior and moral intentions. We contend that the distinction between morality and justice derives primarily from a core differentiation between *motives* and *actions*. As Kant (1997) stated, the value of morality is in the intention, not in what is actually done: the command of morality is first of all to act with good will, even if this may not necessarily produce right actions. In contrast, justice is primarily concerned

with perceptions, behaviors, and outcomes. In general, there can be no justice violation without the occurrence of some sort of offending action or outcome. The intention may then become an issue in judging the severity of the wrong. Within this definition, the self-focused justice perceptions and reactions of individuals have been a primary focus of the organizational justice literature. In other words, how do employees react when they are treated unfairly or receive unfair outcomes?

EMOTION AND COGNITION IN ORGANIZATIONAL JUSTICE

Justice scholars have debated the relative role of cognition versus emotion in explaining how individuals perceive and respond to just (and unjust) treatment and outcomes that they experience. A number of prominent theories of organizational justice have been heavily grounded in cognition. For example, equity theory suggests that individuals consider the balance between their effort and outcomes relative to referent others when making judgments regarding justice (Adams, 1963). The organizational justice literature has borrowed from these scholarly traditions, as it has emerged as a dedicated area of research with its own descriptive agenda (Cropanzano, Bowen, & Gilliland, 2007). Fairness theory is one such theory that describes how individuals assess justice and accountability for injustice in the workplace using contrastive thinking (Folger & Cropanzano, 2001). More recently, scholars have focused on investigating the dimensions of organizational justice such as distributive and procedural justice. These efforts have relied heavily on the mainly cognition-oriented social exchange theory to justify the mechanisms and linkages between each foci of justice and attitudes and behaviors (Cropanzano & Rupp, 2008). In short, cognition has been a dominant perspective within the bulk organizational justice literature.

In contrast, the broader justice literature has long recognized the role that emotions play in shaping the experience and response of individuals who encounter injustice (Homans, 1961). Recently, there has been renewed interest in the role of emotions in organizational research in general (Barsade & Gibson, 2007; Elfenbein, 2007; Gaudine & Thorne, 2001). While organizational justice has traditionally embedded emotions as parts of its wider framework (Colquitt et al., 2013), the ongoing "affective revolution" (Barsade, Brief, Spataro, & Greenberg, 2003) has encouraged a

more narrowed account of affect and discrete emotions as key elements behind justice perceptions and behaviors in the workplace. The body of works on emotions has largely relied on a valence approach and investigated positive and negative affect in response to unfair treatment. A number of studies have found that distributional, procedural, and interactional justice violations are associated with a negative affective response (see Barsky & Kaplan, 2007, for a quantitative review). Organizational justice researchers have also begun to incorporate discrete emotions into their investigations. Weiss, Suckow, and Cropanzano (1999) first showed that different combinations of distributive and procedural justice produced unique patterns of discrete emotions. In summary, the affective perspective also plays an important role in organizational justice research.

To date, organizational researchers investigating individual reactions to unfair treatment have largely chosen one perspective or the other to inform their predictions. Surprisingly, there have been few attempts to include both perspectives within studies, much less to develop overarching theoretical models that incorporate both perspectives. A recent meta-analysis of the justice literature found meaningful indirect effects of justice dimensions through both social exchange and affective measures (Colquitt et al., 2013). The effects of social exchange and affect had to be tested separately, however, due to the paucity of studies that included measures of both. The authors specifically called for more integration of social exchange and affective perspectives in future research.

INTEGRATING COGNITION AND EMOTION WITH NEUROSCIENCE

In neuroscience, the debate between the competing roles of cognition and emotions has been a topic of debate and empirical investigation for a long time. As a result, ONS is uniquely suited to resolve this issue for organizational justice. For one, the debate between emotion (e.g., intended as automatic processing) and cognition (e.g., intended as controlled processing) largely ended in a draw (e.g., Izard, 2009). That is, emotion and cognition are so tightly entwined that both must be considered. Dual-process models in behavioral psychology have tended to consider emotion and cognition as parallel processes. Neuroscience shows that dual processing is not only parallel but is also highly interactive (Satpute & Lieberman, 2006). It is clear that dual-process models are particularly applicable for the

context of organizational justice and could help to foster the integration suggested by Colquitt et al. (2013). More so, dual-process models make it clear that models that only include emotion or cognition are misspecified, and hence cannot possibly fully capture what is actually occurring.

One reason that ONS has not been more widely adopted within organizational research is a diffuse misunderstanding of neuroscience research. For instance, many of the attention grabbing findings from functional magnetic resonance imaging (fMRI) studies tend to produce localization lay interpretations. In these studies, when an individual performs a task or makes a decision, certain regions of the brain are often found to more strongly activated than others. Yet, people outside of neuroscience wrongly interpret this to mean that those are specialized brain regions uniquely associated to distinct behaviors. By extension, some people expect that we should be able to locate the "justice" area of the brain and determine if justice depends more on emotion or cognition. In truth, there are very few brain regions that are so highly specialized. Most regions are involved of a range of focused yet flexible processing: for instance, simply put, the amygdala plays a role in emotional processing and response, the frontal lobes provide a variety of working memory and executive control functions, and the anterior cingulate serves as an intermediary between emotion and cognition. As a result, any single localization interpretation is largely inductive in nature. Over time, it has become clear that most complex processing is highly networked and recruits multiple brain regions (Sporns, Chialvo, Kaiser, & Hilgetag, 2004). As such, any complex psychological process such as justice perception and response relies on a number of brain regions in an extremely dynamic fashion (Verplaetse, 2009).

In addition, thus far, justice researchers have relied almost exclusively on self-report measures of cognitive and affective constructs. This was reasonable for measuring cognitive perceptions or complex emotions that result from appraisal theory. However, the dual-process models of ONS indicate that automatic and implicit processing and basic emotional responses also need to be considered in order to fully understand how individuals respond to unfairness. Neuroscience also makes it clear that discrete emotions are more informative than a valence-based approach to affect. ONS can also provide new measures of automatic and implicit emotional response that will allow organizational researchers to investigate these responses (Becker & Menges, 2013). In short, ONS provides insights and tools that are needed to integrate the cognitive and affective perspectives of organizational justice. To illustrate these points, we detail some recent findings in the next sections.

ONS FINDINGS FOR INDIVIDUAL JUSTICE

Unfair situations are frequently reported in organizations and often elicit strong feelings of injustice in employees. Indeed, the management literature has shown that unfair treatment plays a central role in work behavior, feelings, and attitudes (for reviews, see Brockner & Wiesenfeld, 1996; Lind & Tyler, 1992). Workers who experience first-hand unfair treatment are reported more likely to leave their jobs, reduce their commitment, and behave in anti-normative ways (Greenberg, 1993). While these observations are well documented, a key question remains: Why do individuals react so strongly to unfair treatment? As we have seen, thus far, organizational justice research has tended to explore cognition or emotion-based accounts of these reactions.

Neuroscience has begun to reveal how and why justice behaviors are produced in human brains. For instance, as Tancredi (2005) outlines, moral constructs "would not exist without the brain," and clearly similar considerations apply to human responses to unfair actions. A number of valuable insights come from individuals with impaired brains that dispose them to deviant social behavior (Anderson, Bechara, Damasio, Tranel, & Damasio, 1999). This has helped to dissociate and characterize the affective and cognitive processes that shape ethical decisions (Moll, Zahn, de Oliveira-Souza, Krueger, & Grafman, 2005). For instance, anger or disappointment for unjust outcomes are often linked to brain structures connected with emotional response and rewards (for an overall review, see Lieberman, 2007).

Across studies, a number of brain regions have been consistently implicated in justice-related functions. The anterior insular cortex is one such brain area. It is strongly associated with disgust and other negative emotions (Calder, Lawrence, & Young, 2001). In particular, it has been shown that ethically salient emotions also elicit disgust and increased insula activation when individuals experience unfair treatment or group exclusion (Haidt, 2003; Rozin, Haidt, & McCauley, 1999). We also know that employees often feel disgust in response to unfair actions by their managers or organizations (Weiss et al., 1999). Furthermore, the anterior insular cortex appears to be strongly involved in justice-related behaviors, such as the rejection of unfair offers (Sanfey, Rilling, Aronson, Nystrom, & Cohen, 2003; Zaki, Davis, & Ochsner, 2012), and in resentment when being excluded from a group (Eisenberger, Lieberman, & Williams, 2003).

There is additional evidence that fair treatment produces positive emotions that are linked to specific neural correlates. For instance, Tabibnia,

Satpute, and Lieberman (2008) investigated the positive emotional impact of fairness by examining self-reported happiness and neural responses to fair and unfair offers. Controlling for monetary payoff, they found that fair offers were associated with greater happiness and activation in the so-called "reward regions" of the brain. Thus, this research suggests that our brain employs areas originally developed for basic emotional response for more complex mental tasks (e.g., responding to unfair treatment). It also suggests that the brain employs fundamental structures, whose basic functions may share little with justice per se, to promote "just" behaviors or elicit emotions related to justice in social circumstances. These studies support the idea that emotions play a fundamental role in justice perceptions and behaviors. Furthermore, there is compelling evidence that our initial response to such situations is emotion based, even if these emotions do not rise to consciousness (Izard, 2009).

However, neuroscience also confirms the assertion of Colquitt et al. (2013) that organizational justice needs to develop theories that integrate emotion and cognition. Indeed, Sanfey et al. (2003) shed light on how emotion and cognition may interact in response to unfairness. In their neuroimaging study, participants participated in an Ultimatum Game (UG), where the first individual (confederate or computer) proposes a potential division of a fixed sum of money and the second individual (participant) decides whether to accept or reject the proposal. If the participant accepts the offer, the money is split as proposed; if the offer is rejected, neither player earns any money. Interestingly, participants are more likely to reject offers that are considerably lower than half of the total as unfair (Greene, 2009).

Using fMRI, Sanfey et al. (2003) found that the insula activation increased with the magnitude of unfairness. It was also more active in human- versus computer-generated offers and was positively associated with an increased likelihood of offer rejection. So again, this indicated that individuals initially responded to unfair treatment with an emotional response and many individuals acted upon this response. However, another brain region, the dorsolateral prefrontal cortex (dlPFC), also showed increased activation in response to unfair offers in many subjects. This region has been associated with higher cognitive functions, such as planning, inhibition, and abstract thinking. While there is some debate on the role of the dlPFC (cf., Knoch, Pascual-Leone, Meyer, Treyer, & Fehr, 2006), increased activity in the dlPFC was positively associated with the acceptance of unfair proposals and to decreased activity in the insula.

The researchers concluded that the dlPFC was able to override the negative emotional responses to unfairness (and the impulse to reject the offer) when rational and fairness motives were in conflict. Simply put, these results may suggest a mechanism by which the brain allows people to swallow negative emotions that are provoked by unjust deals when they judge that it is in their long-term self-interest to do so. Similarly, employees may initially perceive that their supervisor is unfair, but nevertheless realize that it is in their best long-term interest to not react angrily and even come to realize over time that their perceptions were not accurate. Altogether, these findings confirm the importance of continuing to develop and investigate dual-process models of organizational justice.

NEUROSCIENCE-BASED MANIPULATION OF INDIVIDUAL JUSTICE

Organizational justice researchers are also concerned with the practical implications of how their theories might be used to make the workplace more just (Greenberg, 2009). Thus far, these interventions have been limited to relatively mundane methods such as training or procedural changes (Kickul, Lester, & Finkl, 2002; Skarlicki & Latham, 1996). As we have shown, dual-process consideration of both emotion and cognition are necessary in order to fundamentally alter individual justice perceptions and behavior. Therefore, we need to develop interventions that address both. Neuroscience research has already begun to investigate whether the brain can be "engineered" to alter how individuals respond to injustice.

For example, Knoch et al. (2006) examined what happens if brain processing is temporarily disrupted while deciding to accept or reject offers in the UG, which we discussed in the previous section. These researchers employed transcranial magnetic stimulation (TMS), a noninvasive method used to inhibit activity in local regions of the brain (O'Shea & Walsh, 2007). Remarkably, one-third of the participants whose right dlPFC was stimulated accepted all the offers, even those clearly unfair. Interestingly, the TMS treatment did not impact participants' justice perceptions and they still reported that the accepted offers were unfair. From a practical perspective, these results suggest that it may be possible to alter how individuals respond to injustice in the workplace in productive ways. In this case, individuals recognized injustice but responded "rationally" rather than

"emotionally." If this could be accomplished in the workplace, employees could be influenced to not act out of anger and could likely address the injustice more constructively over time.

Clearly, neuroscience efforts to alter brain processing using TMS are in the very early stages of development and not likely suitable or practical for organizational settings. However, the possibility of altering individual justice perceptions and behaviors is too impactful to ignore. As we have seen, we know that our brain plays important roles in emotional and cognitive justice processing. We also know that brain areas are active in a variety of different tasks that require emotional or cognitive processing. Rather than stimulating or suppressing activity in these regions using artificial means such as TMS, neuroscientists have also begun to explore the possibility that these regions can be primed to promote more emotional or cognitive response using other tasks (Kvaran, Nichols, & Sanfey, 2013). So far, these efforts have produced modest effects using simple scenario or math-based tasks. These methods of influencing individual justice behavior should be explored and adapted in organizational justice research. Furthermore, there are also promising methods of bringing about changes using the sorts of neurofeedback techniques described by Waldman, Balthazard, and Peterson (2011), as well as in chapters "Neuroenhancement in tasks, roles, and occupations" and "Neuroscience of leadership" of this book.

OTHER-FOCUSED JUSTICE

Our second topic focuses on other-focused organizational justice. Broadly defined, this involves justice sensitivity towards others, how individuals evaluate and react to experiences of injustice with which others are treated (Yoder & Decety, 2014). In particular, we are interested in why and how managers and employees value or devalue fair treatment of others. It is fairly intuitive that our "self-interested" brain is concerned with our own experiences of first-hand justice events. Indeed, this concept has important foundations both for who we are and how we act (Baumeister & Exline, 2000). However, it is becoming increasingly clear that employees often also respond to the unfair treatment of others such as coworkers (Spencer & Rupp, 2009), customers (Skarlicki, van Jaarsveld, & Walker, 2008), and even the society in general (Rupp, 2011).

NEUROSCIENCE IMPLICATIONS FOR DEONTIC JUSTICE

Generally speaking, organizational scholars have used the concept of deontic justice to account for reactions to third-party justice (Rupp & Bell, 2010). The deontic model of justice suggests that individuals value the fair treatment of others because they care about justice as a principle (Cropanzano, Goldman, & Folger, 2003). Scholars have generally suggested that deontic justice relies heavily on emotion, and one recent study even proposed a dual-process model of deontic justice (Skarlicki & Rupp, 2010). However, these studies have not fully explained why individuals care about deontic justice. More importantly, they do not address why people often do not seem to care about the justice of others at all. Neuroscience is uniquely suited to address these important questions and refine theories of deontic third-party justice by illuminating some of the underlying brain mechanisms and correlates.

Not surprisingly, the mechanics of other-focused justice are quite complex. Nonetheless, given the strong association of deontic justice with emotional response, it seems clear that empathy plays a role in why individuals care about justice for others. The neuroscience of emotions and affect, including the affective aspects of empathy, are highlighted in the chapter "Neuroscience as a basis for understanding emotions and affect in organizations" of this book as well. Nevertheless, we will specifically address how empathy, justice, and neuroscience can be brought together.

The association between empathy and justice was demonstrated in a study by Batson, Klein, Highberger, and Shaw (1995). Empathy provides a sense of similarity in feelings experienced by the self and the other (Decety & Lamm, 2006). More importantly, research has shown that empathy is a multifaceted construct (Batson, 2009). The findings indicate that empathy can be induced by both top−down and a bottom−up processing systems − the former being more conscious and cognition based and the latter being more automatic and emotion based.

Decety and Batson (2009) suggest that the lateral prefrontal cortex and the anterior cingulate are essential parts of the cognition-based system that can produce top−down, empathic emotions. The automatic emotional empathy system has been further reinforced with the discovery of mirror neurons as a possible neuroscience explanation (Rizzolatti & Craighero, 2004). Research increasingly suggests that a "mirroring" system automatically causes us to experience the affective feelings we observe in others.

Lamm, Decety, and Singer (2011) found that when we observe other peoples' emotional states, the anterior insula and the cingulate show similar activation to when we personally experience physical or emotional pain, embarrassment, admiration, or disgust. Several studies have shown that perceiving familiar others in pain generally leads to empathic concern (Decety & Lamm, 2006; Singer et al., 2004).

Empathy provides a robust mechanism for deontic justice to occur. When we see other people treated unfairly, we can literally feel their pain, either automatically or through conscious reflection. As a result, we may feel similar emotions and react as if the injustice had occurred to us. The evidence suggests that emotional empathy is more likely to produce stronger reactions than cognitive empathy. In addition, given the neural correlates identified for each, neuroscience also provides a number of promising methods for determining the relative effects of each for deontic justice (Dziobek et al., 2011).

This also suggests and answers to why sometimes individuals do not value justice for others and are even capable of behaving unjustly or immorally towards others. Birbaumer et al. (2005) showed that individuals with high levels of psychopathy, characterized by lack of empathy, showed typical responses for pain when imagining the pain as occurring to them. However, when they imagined pain to others, these regions did not show activation compared to controls. Not only did they not feel the pain, subjects actually showed an increased response in the ventral striatum, an area often connected to feelings of pleasure. It seems that, when we do not experience empathy, we do not sympathize with and may even take delight in the misfortunes of others.

However, once again, deontic justice, like individual justice, has both emotional and cognitive components. Individuals who are lower in emotional empathetic response can still value the justice of others through cognitive empathy. The efficacy of cognitive empathy training has been demonstrated with individuals with Asperger's Syndrome whose capability for emotional empathy is extremely impaired (Golan & Baron-Cohen, 2006). However, this process is slow and requires an internal or external trigger to initiate the cognitive effort necessary to produce. Therefore, individual differences in empathy can likely account for some of the observed differences in people valuing or devaluing the justice of others in the workplace. Thus far, the evidence suggests that these individual differences are much more pronounced for emotional, as compared to cognitive, empathy. Emotional empathy deficits in individuals with autism, Asperger's Syndrome, and borderline psychopathy have helped our understanding of

the linked to brain regions that are important for automatic processing of emotion (Blair, 2010; Dziobek et al., 2011). There is also evidence that individual differences in the default mode network of the brain are associated with emotional empathy deficits (Cox et al., 2012). This network is discussed elsewhere in this book, including chapters "Antagonistic neural networks underlying organizational behavior" and "Neuroscience of moral cognition and conation in organizations."

EMPATHY AND INGROUP/OUTGROUP CATEGORIZATION

Social categorization (in/outgroup) phenomenon can also inform theories of when and why individuals value or devalue justice experienced by others. The notion of "others" as people belonging or not belonging to one of our valued social groups has profound effects on our social interactions and relationships (Oakes, Haslam, & Turner, 1994). Neuroscience has shed new light on how these categorizations might affect deontic justice. In general, findings suggest that ingroup membership enhances (and outgroup membership suppresses) both emotional and cognitive empathy (Eres & Molenberghs, 2013). In a study of particular interest, individuals observed a member of their ingroup (fellow fan of their favorite team) or outgroup (fan of rival team) experience pain (Hein, Silani, Preuschoff, Batson, & Singer, 2010). When observing the ingroup, individuals showed increased activity in the insula and were more likely to help the other person. Those who observed an outgroup showed greater activation in the nucleus accumbens (often associated with reward processing) and lower activation in the insula when they chose not to help. In addition, these activation patterns were a better predictor of individuals' willingness to help an outgroup member than were self-report measures of empathy.

In a similar vein, oxytocin, a neuropeptide associated with increased affection and trust toward others, has been shown to increase empathy and positive affect toward ingroup members (Bartz, Zaki, Bolger, & Ochsner, 2011). However, elevated levels of oxytocin have also been shown to decrease empathy and increase negative emotions and competition toward outgroup members (De Dreu, 2012; De Dreu, Greer, Van Kleef, Shalvi, & Handgraaf, 2011). This research suggests that group categorizations fundamentally alter trust processing. When an individual views someone as an

ingroup member, we are biased to value justice for that person. In stark contrast, for perceived outgroup members, we seem to be equally biased toward devaluing and even disregarding altogether their feelings and fair treatment.

Overall, these examples from neuroscience provide promising insights into the question of when and why people value justice experienced by others. Empathy clearly plays a central role. Nonetheless, even empathy involves both emotional and cognitive processing. Finally, neuroscience findings and measures of outgroup bias have great potential for explaining and moderating some of the more troubling deontic justice failures whereby individuals ignore injustice that does not involve them directly, or worse, purposefully treat others unfairly. This concept should be familiar to organizational justice scholars, since outgroup membership has been identified as a predictor of discrimination and prejudice (Stone-Romero & Stone, 2005). Nonetheless, ONS provides new theoretical insights and methods for investigating the roles of empathy and group categorization in deontic justice.

CAN WE INDUCE GREATER CONCERN FOR THE JUSTICE OF OTHERS?

As before, organizational justice research should also be concerned with how we might increase employee and manager concern for the justice of others in ways that can improve organizational outcomes and individual well-being. This is especially true as interest has grown in promoting empathetic leadership and more compassionate organizations (Barsade & O'Neill, 2014; Mahsud, Yukl, & Prussia, 2010). Once again, neuroscience research provides a number of theoretical insights and potential active interventions that can be brought to bear on this endeavor.

A number of neuroscience studies have begun to investigate how the use of TMS can influence justice perceptions and behaviors toward others. For instance, Uddin, Molnar-Szakacs, Zaidel, and Iacoboni (2006) asked research participants to look at pictures in which their own face was progressively changed into a stranger's and report if they could recognize themselves. Application of TMS on the right inferior parietal lobe while performing on this self versus others task considerably impaired the subjects' ability to discriminate their self from others. This result is potentially interesting since distinguishing ourselves from others

plays an important role in justice judgments. In another study, TMS disruption of the dlPFC resulted in less cooperative and more selfish behavior (Buckholtz & Marois, 2012). In a subsequent study, disrupting the activity of the dlPFC resulted in increased willingness to punish others who acted unfairly to a third party (Brüne et al., 2012). Taken together, these results suggest that intervening in other-focused justice is much more complex and potentially perilous undertaking than with individual justice. On the one hand, diminishing an individual's "executive processing" could make the person less concerned with fairness directly, but on the other hand, it could make the person more willing to punish injustice on behalf of others. Nonetheless, these lessons from neuroscience likely also apply to more traditional, other-focused justice interventions as well. Certainly, this topic merits increased attention and investigation within organizational justice. And as mentioned earlier, the types of neurofeedback interventions described by Waldman et al. (2011) might be employed to achieve change in individuals, particularly those who might be lower in emotional empathy.

Neuroscience has also explored the modification of other-focused justice behaviors using pharmacological approaches, like those involving intranasal administration of oxytocin, which has discernable effects on brain functioning (Kosfeld, Heinrichs, Zak, Fischbacher, & Fehr, 2005). As discussed earlier, oxytocin's association with increased trust, bonding, and empathy sparked significant research interest. In one study, subjects whose oxytocin levels were artificially increased via intranasal spray behaved more fairly in a trust game (i.e., they assigned more money to the trustees). In another study, elevated levels of oxytocin were associated with increased concern for a victim of a crime, but not with a greater desire to punish the offender (Krueger et al., 2013). Once again, these types of interventions do not always produce the intended effects. As we discussed earlier, increased oxytocin levels seem to have the opposite effects on prosocial behavior toward others who are in an outgroup. In sum, any attempts to increase individuals' concerns for others also need to be extremely well thought out and tailored to the specific social contexts of the organization in which the intervention takes place. Findings from neuroscience make it clear that there is no silver bullet or simple answers when it comes to other-focused justice. Indeed, in the quest to better understand and eventually manipulate justice, only interdisciplinary research performed at the highest scientific standard will balance the

hope and hype currently surrounding neuroscience research in the workplace (Massaro, 2015; Waldman, 2013).

CONCLUSIONS

The goal to further understand organizational justice perceptions and behaviors is an essential endeavor to better understand human flourishing and struggles inside organizations. In modern organizations, the ability to recognize and respond to unjust behavior oriented towards us or to a teammember is beneficial, while its lack is a serious social peril (Greenberg & Cropanzano, 1993). With advancing knowledge on the neuroscience of justice, and organizational research beginning to implement these insights in their frameworks (Salvador & Folger, 2009; Robertson et al., 2007), an ONS perspective offers considerable room to broaden our theoretical and practical knowledge of organizational justice.

In this chapter, rather than to advance a "neuro-model" of organizational justice, we sought to demonstrate that neuroscience should be viewed as a source of theoretical insights and methodological tools that can enhance and unify existing organizational justice theories. To that end, we reviewed two general topics for which basic neuroscience findings are relevant to both scholarly investigations and practice. For individual justice, we explained how neuroscience supports the need to integrate both emotion and cognition into theories of organizational justice. We also reviewed some avenues for creating interventions to manage individual responses to justice. For other-focused justice, we reviewed how empathy provides a fundamental mechanism for deontic justice that incorporates both emotional and cognitive elements. We also revealed that practical interventions for other-focused justice are particularly complex and not to be undertaken lightly. To this end, neuroscience again provides some exciting new possibilities for future interventions.

In conclusion, the broader field of ONS is still in its relative infancy and will continue to develop rapidly. Rather than simply being passive observers and consumers of this new knowledge, we believe that it will be important for organization justice researchers to become active participants. More dedicated interdisciplinary research is needed to advance organizational justice and neuroscience research forward in the most efficient and

informative manner possible. In this way, rigorous experiments across fields, converging measures, sound meta-analyses, and multiple sources of confirmation will produce new theoretical models and ecologically valid practical interventions.

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