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A Role for Emotional Granularity in Judging

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Abstract

Emotions are traditionally viewed as detrimental to judicial responsibility, a belief rooted in the classical view of the mind as a battle ground between reason and emotion. Drawing on recent developments in psychology and neuroscience we propose that the brain uses past experience, organized as concepts, to guide actions and give sensations meaning, constructing experiences such as "fear" or "anger". Wisdom comes from skill at constructing emotions in a more precise and functional way, a skill called "emotional granularity". Studies show that individuals who are more emotionally granular have better function across a range of domains, including self regulation and decision making. We propose that effective judicial decision-making does not require a dispassionate judge, but a judge who is high in emotional granularity. We lay out an empirical agenda for testing this idea and end by discussing empirically supported recommendations for increasing emotional granularity in the judiciary.

Key words

Emotion; granularity; decision-making

Resumen

Tradicionalmente, se ha considerado que las emociones son perjudiciales para el desempeño responsable de la labor judicial, una creencia enraizada en la concepción clásica de la mente como campo de batalla entre razón y emoción. Partiendo de nuevos descubrimientos en psicología y neurociencia, argumentamos que el cerebro usa la experiencia pasada, organizada como conceptos, para guiar las acciones y dar sentido a las sensaciones, construyendo experiencias como "miedo" o "ira". La sabiduría proviene de la habilidad en construir emociones de un modo más preciso y funcional, habilidad denominada "granularidad emocional". Los estudios muestran que los individuos más granulares emocionalmente funcionan mejor en varios dominios, incluyendo la autorregulación y la toma de decisiones. Argumentamos que la toma de decisiones eficaz en judicatura no requiere de un juez desapasionado,

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sino de un juez que tenga alta granularidad emocional. Proponemos un programa empírico para poner a prueba esa idea, y concluimos con un debate de recomendaciones de base empírica para aumentar la granularidad emocional en la judicatura.

Palabras clave

Emoción; granularidad; toma de decisiones

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1. Introduction

Since ancient Greece, the distinction between cognition and emotion has pervaded academic and applied fields. Plato's tripartite theory of the soul – which distinguished between reason, emotion and motivation – is one of the first examples of this distinction in Western philosophical tradition. In this tradition, mental phenomena are divided up as "rational" cognitive and "irrational" emotional faculties. The traditional oppositional framework further characterized these two systems as continuously battling for control over our behavior. A consequence of this framework is the assumption that good decision-making is defined by reason winning out over emotion. Healthy, responsible and just decision making, in domains like healthcare, economics and the law, is classically defined by the suppression of an emotional response and the insight gleaned from rational analysis.

The ideal of the "dispassionate judge", pervasive in the Western legal tradition and with historic roots in the European Enlightenment (Maroney 2011), is an unmistakeable instance of the oppositional framework between cognition and emotion. While the fictional nature of this ideal is increasingly acknowledged – there is no doubt that judges experience intense emotions like anger (Maroney 2012) – the place of emotions in judicial practice is still actively debated (for example, Lee 2013). What *should* be the role of anger, empathy and so on in judging?

Here, we provide a psychological and neuroscientific perspective on judging by considering how the constraints of the human brain bear on the realities of judicial work. This is not the first integration of its kind. There has been significant progress in psychology and neuroscience over the last 30 years that has largely dispelled the oppositional framework between cognition and emotion. Emotions have come to be understood as a pervasive mechanism contributing to human decision-making. Maroney incorporated these insights, outlining how emotions may be necessary for to judicial decision making (Maroney 2016). In particular, accumulating work makes clear that processing of signals from the body's periphery, a process termed interoception (Critchley *et al.* 2004), plays a fundamental role in guiding decisions (Damasio 1994, Dunn *et al.* 2010). This shift occurred in the field of neuroeconomics, where emotional contributions to decision making are accounted for with the construct of *value* (defined based on choice behavior) (Glimcher and Rustichini 2004, Sanfey *et al.* 2006). (Some researchers have argued that affective experience is epiphenomenal to decision making, whereas *value* computations are the more pertinent construct for studying decision making. From a neurobiological standpoint, these two constructs (affect and value) are not entirely distinguishable: they both engage regions (e.g., the ventromedial prefrontal cortex; vmPFC) that are involved in the issuing of commands to control internal organs.)

Despite this progress in breaking down the oppositional account of cognition and emotion, these approaches continue to characterize emotions and cognitions as fundamentally distinct capacities that merely interact. Here, we review four advancements in the science of emotion that indicate this boundary between cognition and emotion may be superficial. We then discuss the implications for judicial practice by considering how individual differences in the use of conceptual knowledge about emotion by judges warrants further attention.

2. Four Advancements in the Science of Emotion

Recent advancements in the psychology and neuroscience of emotion challenge the assumption of domain-specificity – the idea that emotion and cognition are domains that are inherent to human biology. These advancements have important implications for the role of emotion in decision making (and other mental phenomena more broadly) and have applied implications for how to conceptualize the role of emotion in judicial practice. We next outline these four advancements.

Advancement 1: The Limbic Fiction and Discovery of Multi-Use Networks

The first advancement reveals that emotions are not relegated to deep "animalistic" structures in the brain. In classic neuroscience approaches, a set of regions, referred to collectively as *limbic* circuitry, were assigned as the brain loci of emotions (i.e., the amygdala, nucleus accumbens and the rest of the ventral striatum, the anterior, mid, and posterior cingulate cortices, the ventromedial prefrontal cortex, the anterior insula and others). In fact, brain regions were assigned to this limbic system based on their observed functions (not based on anatomical features) in a quest to divide the brain into cognitive and emotional domains (Pessoa and Hof 2015, Barrett 2017b).

Human neuroimaging studies reveal that treating the limbic system as the seat of emotion is incorrect. First, emotions are not exclusively located in limbic regions. Many classically "cognitive" regions such as those that implement semantics, language and cognitive control are routinely engaged in emotion (Kober *et al.* 2008, Lindquist *et al.* 2012). This indicates that the cognitive-emotional divide is not evident in the brain basis of emotion. Second, previously proposed mappings between certain emotions and certain brain regions (for example, the classic hypothesis that the amygdala is the brain basis of fear) are not supported by the evidence. Brain regions like the amygdala are active across many emotional states (happiness, sadness, fear and so on) and their activity is often better predicted by the methods used to induce the emotional response in the research participant (Lindquist *et al.* 2012). Scientists have not discovered a stable seat of specific emotions in the brain.[1]

Recent neuroimaging advances have also uncovered that the brain is organized into a set of large scale networks (Yeo *et al.* 2011). These networks are each comprised of regions that are distributed across the brain (they are not necessarily close in space) and are defined by the fact that the regions within them tend to co-activate. Many of the limbic regions form part of the *salience network* in the brain. This network, and others like it, is considered multi-use or domain general because it flexibly combines with other networks to support different types of brain states we refer to as memories, perceptions, and emotions. The key insight is that networks like the salience network cross-cut "cognitive" and "emotional" phenomena and instead should be thought of in terms of more basic operations (e.g., representing information from prior experience, detection of salient input from the environment, switching between modes of operation in the brain). As a result, a network organizational structure of the brain undermines the assumption that there is a clear cognition-emotion domain divide.

Advancement 2: Bodily Control is Central Task of Brain (and Creates Feelings)

A second advancement is converging evidence that bodily control is central to the organization of the brain. Rather than viewing the brain as an organ that evolved for thinking or feeling, research suggests that the brain evolved to control the systems of the body in a predictive manner (Barrett 2017b). Keeping the systems of the body regulated is accomplished by anticipating upcoming challenges and rewards and adjusting the body's systems in order to meet those demands. This cascade of processing is termed "predictive allostasis" (McEwen 2000, Sterling 2012, Seth and Friston 2016, Kleckner *et al.* 2017). Allostatic regulation of the body is accomplished by multiple means, including alterations of hormones, alterations in cytocines modulating the immune system and shifts in autonomic control of organ functions. Thinking and feeling are thus proposed to be the consequences of how the human

[1] This is not to say that emotions do not pattern in certain ways in the brain. When cutting edge statistical techniques (i.e., machine learning of voxel patterns across the brain) are employed, it is possible to recover maps for different emotions that are distinct. One for each emotion like anger fear and sadness. But these maps only reveal regions that are *more likely* to be associated with one emotion over the others. In a given instance of emotion, none of the regions described by that pattern are necessarily present (Clark-Polner *et al.* 2017). As a result, these patterns should not be interpreted as biological markers of emotions.

brain evolved to accomplish the regulation of these systems over multiple timescales (Barrett 2017b).

Predictive regulation of the body appears to be coordinated by limbic regions, which form part of the salience network in the brain (Barrett and Simmons 2015, Barrett *et al.* 2016, Kleckner *et al.* 2017). To efficiently control the body, the brain must monitor multiple systems (Seth *et al.* 2012, Seth 2013, Pezzulo *et al.* 2015). Signals from the body – information about pain, temperature, itch, hunger, thirst, and need for air, as well as sensual touch, muscular and visceral sensations – are continuously sent to the brain. The detection of these signals in the brain is called *interoception* (Craig 2002) and is supported by the salience network (Kleckner *et al.* 2017). Some of these sensations can be represented directly in conscious awareness (e.g., our breath) but many of them are not (e.g., our blood pressure). Typically, interoceptive information impacts our conscious awareness as core feelings – this is a dramatic reduction in the complexity of the information coming from the body. These feelings typically are good or bad and can feel activating or not; and they continually color our conscious experience of the world (Russell and Barrett 1999).

Given the role that limbic regions are playing in both control and monitoring of the body – describing these regions as "emotional" might appear fitting. Yet this system is not only involved in emotions. The neural systems performing these tasks are engaged across a range of mental states (Craig 2015). The brain is continuously monitoring the needs of the body and predictively regulating it (Sterling and Laughlin 2015). The implication is that no decision, thought or perception is ever free from these simple feelings (what we term "affect") (Barrett 2017a). It would be biologically implausible for this system to simply stop directing, monitoring and adjusting these systems of the body.

Advancement 3: Emotions are Bodily Sensations Conceptualized

Once information from the periphery makes it to the brain, the brain has the task of making sense of those sensations. In some theoretical accounts, this is understood to be a secondary process in emotion: an emotion is defined as the distinctive pattern of changes in the body (and tendency to behave in a certain way, like to fight in anger). The experience of emotion is the ability to represent those changes in consciousness based on what the brain is detecting in the body (Dewey 1895, Young 1943, Bull 1945, Damasio 1994). This would be a straightforward task for the brain if physiological changes in the periphery were organized into distinct patterns, one for each emotion. The brain could simply to categorize what changes are happening in the body – essentially matching the array of bodily changes to a stored pattern for each emotion.

Yet instances of emotion do not share clear physiological or motor patterning that the brain can simply categorize. A recent meta-analysis of the bodily changes that occur in emotion revealed that there are not distinct and reliable patterns for emotions like anger, fear and sadness (Siegel *et al.* 2018a). Instead, when researchers induced people to feel sad or disgusted, for example, they showed remarkable diversity in their bodily responses. In the experience of disgust, an individual's heart rate might go up or down. Blood pressure might increase or decrease. In many cases, these measures of the cardiovascular system may not change at all from a resting state. This variation in autonomic response not only characterizes the cardiovascular system, but also sympathetic and parasympathetic innervation of other organ systems as well. This does not mean that there are no organizational, functional principles to bodily control. Instead, autonomic responding can be understood in the context of the current state of the body (i.e., where the individual is in autonomic space in terms of activation of sympathetic and parasympathetic branches (Berntson *et al.* 1991, 1993) and what the body is preparing to do.

Important, the same changes in the body (increase in heart rate, increased sweat in the palms of the hands) occur across many different types of emotional experience (i.e., states are not distinguishable based on the bodily response). Instead of detecting a specific pattern for each emotion, the brain must make sense of the many, fluctuating signals from the body. A second brain network, called the default mode network (DMN) (Hassabis and Maguire 2009, Buckner 2012, Mesulam 2012) helps to accomplish this task. This network allows us to construct mental models of the world from different points of view and different time points. In emotion, this network is proposed to generate predictions about what sensory input from the body means and what to do about it (Satpute and Lindquist 2019). This is accomplished by culling information from past experiences that are similar to the present moment.

Prior experiences are represented as conceptual knowledge, also known as semantics or concepts (Murphy 2002) – they are what we know about something. The same set of regions that comprise the default mode network are involved when people use their conceptual knowledge (Binder *et al.* 2009, Binder and Desai 2011). Important, when we represent a concept, we do not activate an exhaustive representation of prior experiences. Instead, we activate the aspects that are most useful in the present circumstances (this is termed situated conceptualization (Barsalou 1999, Barsalou *et al.* 2003). When you activate knowledge of a concept like fear, the aspects of the concept that you bring online are going to vary dramatically depending on whether you are on a roller coaster or about to engage in public speaking (Wilson-Mendenhall *et al.* 2011, 2013).

The types of categories that the brain uses to make sense of sensory information, such as an elevated heart rate, vary widely (Heelas 1996). Even when the body is highly mobilized (the individual's physiology is very different from a resting, quiescent state) and the circumstances are ones that would normatively be considered "emotional", an individual does not always experience an "emotion". Sometimes signals from the body can be experienced merely as bodily sensations (e.g., feeling "jittery") (Oosterwijk *et al.* 2012). Other times these are experienced as properties of the world (e.g., aesthetic pleasure in response to a work of art) (Lambie and Marcel 2002). A criterion that can define emotion, then, is that knowledge about emotion(s) is used to guide action, perception and thought (Barrett 2017a). Of course, people frequently experience emotions without explicitly representing them with a label ("I am afraid") and being aware that emotion knowledge is activated. Emotion conceptualization may proceed in an automatic, implicit fashion (Zemack-Rugar *et al.* 2007).

Advancement 4: Individual Differences in the Granularity of Emotion Construction

Just as concepts for emotions are not always used to make meaning of signals from the body, there are differences across individuals in how concepts for emotions are used. Within the general population, people vary dramatically in their ability to apply emotion concepts to their own and others' experiences with precision and in a manner that is finely tuned to the context (Kashdan *et al.* 2015). This variation in emotional "expertise" is termed "emotional granularity".[2] Individuals higher in emotional granularity make their sensations meaningful using finer-grained emotional distinctions (e.g., anger is distinguished as irritation, frustration, annoyance, etc.).

[2] This construct is related to, but not identical to "emotional intelligence" (Salovey and Mayer 1990). The emotional intelligence literature is broader (Barrett and Salovey 2002), encompassing a range of "abilities" that are proposed to facilitate everyday emotional functioning. A recent extension of the emotional intelligence model now includes emotion differentiation (Mayer *et al.* 2016). Important, emotional intelligence is classically focused on "accuracy" – whether individuals have a correct understanding of their own or others' emotions, which is largely based inonly one normative cultural model of emotion. Emotional granularity is anchored in the neurobiological model laid out here and is more focused on individual precision. What person A and person B feel in the exact same set of circumstances may vary based on their learning history, prior physiological state and so on. Granularity is achieved when an individual uses specifics from their prior experience and their history of cultural learning to make sense of their state or the state of others in the present moment.

Individuals lower in emotional granularity instead experience very general affective feelings (e.g., "pleasant" vs. "unpleasant") but don't further refine these feelings in a consistent manner with concepts.

Granular construction of emotions is highly consequential for individual functioning. The ability to use emotion concepts in a granular manner is associated with more specific action planning and better self-regulation. Individuals who are more granular about positive experiences (they make fine grained distinctions between states like gratitude and awe) report being better at coping with stressors (Tugade *et al.* 2004). For example, individuals high in positive emotional granularity report pausing before behaviorally engaging in a given situation (i.e., they take time to develop an action plan) and as less likely to engage in strategies like self-distraction from the stressor. Superior self-regulation is also evident in the reduced rates of substance abuse (Kashdan *et al.* 2010) and relapse (Anand *et al.* 2017) in individuals who are higher in emotional granularity for negative states. Highly granular individuals are also less prone to binge eating (Dixon-Gordon *et al.* 2014) and physical aggression (Pond *et al.* 2012). In addition to self-regulation, children who are trained to be more emotionally granular attain higher levels of social functioning, and academic performance (Hagelskamp *et al.* 2013, Rivers *et al.* 2013).

Perhaps most critically for the legal context, individuals who are higher in emotional granularity appear to make better decisions. For example, individuals higher in emotional granularity appear to make more sound financial decisions when operating under conditions of uncertainty (Seo and Barrett 2007). Individuals trained to make more nuanced distinctions between emotions, which served to increased granularity, made moral decisions that were less biased by the experience of disgust (disgust was induced before the moral decision task and can therefore be considered incidental/non-informative) (Cameron *et al.* 2013). Taken together, these findings suggest that granularity may be an important construct when considering the role of emotion in judicial practice.

3. A Case for Emotional Granularity in Judging

Based on these four advancements, we propose that effective judicial decision-making does not require a dispassionate judge, but a judge who is high in emotional granularity. The need to consider granularity in the judicial context is nicely illustrated by the below quote:

> A blanket prohibition on emotion hampers a differentiated examination of the role emotions play in judging; judges therefore are hindered (or at a minimum not helped) in their ability to label, identify, and understand their emotions, abilities critical to concepts of emotional intelligence. (Maroney and Gross 2014, p. 148)

The dispassionate judge is simply an unobtainable ideal (Maroney 2011). This ideal can seem absurd when considering the reality of a judge's working hours, which are often filled with charged and vivid accounts of victims who have suffered serious harm. And affective feelings, rooted in our interoceptions of the body, are a pervasive consequence of how the brain is wired (Craig 2015, Barrett 2017a, 2017b). Attempts to fulfil this ideal by suppressing or failing to attend to affect may be detrimental (Maroney and Gross 2014). Actively suppressing feelings can have the paradoxical effect of amplifying physiological responses (Gross and Levenson 1993), effectively creating more allostatic demand for the individual. Simply attempting to ignore feelings can also be detrimental. When feelings are not foregrounded in consciousness, it doesn't render them inconsequential. In fact, scores of studies suggest that when affect is not represented in conscious awareness, it can influence perceptions and decisions even more robustly (for example, Anderson *et al.* 2012, Huntsinger *et al.* 2014).

Granular construction of emotion is also about distinguishing between instances that call for an emotional experience and those that do not. There is a tendency to yoke the sensations of our body to whatever is focal in the moment (Schwarz and Clore

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1983, Russell 2003, Barrett and Bliss-Moreau 2009, Huntsinger *et al.* 2014). If an individual has insufficient sensitivity to the ebb and flow of their affective feelings and fails to initially tie them to the promoting circumstances (either internal or external), they may tie those feelings to irrelevant circumstances – producing incidental emotional experiences. This may be innocuous enough in everyday life. Indeed, the colloquialism "hangry" – a portmanteau between "hungry" and "angry" – calls out just how often this happens and perhaps the phrase helps diffuse the social ramifications of misplaced negative affect/aggression ("I'm sorry, I'm hangry"). Signals from the body about the need for glucose are experienced as anger in contexts that promote high arousal negative emotion (MacCormack and Lindquist 2019). But this type of misattribution may be much more serious in the courtroom, where decisions are highly consequential. This idea was very nicely illustrated by the finding that the harshest of sentences were doled out before lunch breaks (Danziger *et al.* 2011), although there is some debate regarding the mechanism (Weinshall-Margel and Shapard 2011) and plausibility of the effect size (Lakens 2017) in this study.

Judges should also strive for granular inferences about the emotions of defendants and witnesses in their courtroom. Just as individuals can be more or less granular about their own experiences, they can also be more or less granular about the emotions of others. Prior research has underestimated just how difficult this social task is. This is likely due to the proliferation of research tools that dramatically over-simplify the task (e.g., presenting isolated and posed expressions at their apex with a list of pre-populated choices; (Nelson and Russell 2016a, 2016b, DiGirolamo and Russell 2017). In real life, the ability to infer emotion in others involves combining a complex array of non-verbal, verbal and contextual information (Barrett *et al.* 2011, Parkinson 2013, Kayyal *et al.* 2015) and to adjusting those inferences as new information becomes available.

Finally, granularity also involves understanding of how others may use emotions instrumentally as tools for social influence (Crivelli and Fridlund 2018). In everyday social life, expressing an emotion like remorse can serve as a bid to repair damage to relationships. But these types of expressions can also be used to elicit a desirable outcome in a legal context. Real-world instances of remorse may look very different from the cultural stereotype that a judge carries with them. Some defendants may be better at using their nonverbal behavior to communicate information about their emotions in a culturally appropriate way. Other defendants may be adept at generating a set of facial or bodily movements or using words that are consistent with a show of remorse, even if it is not truly felt. There is no way to know for certain. But a fair trial depends, in part, on a judge's ability to achieve some degree of conceptual synchrony with defendants and witnesses so that inferences about their experiences are not based on rigid stereotypes about how people should behave. Enhancing the emotional granularity of judges may be one remedy for such situations.

4. A Call for Research on Granularity in Judging

Additional theoretical groundwork and empirical research is necessary to realize the promise of this integration between the construct of emotional granularity and judicial practice (and potentially in the study of emotion in other legal actors such as jurors).

To begin, descriptive work in this domain is necessary. The development of valid, yet feasible measures of emotional granularity for the judiciary will be necessary to advance our descriptive base. The current measurement of emotional granularity varies from costly experience sampling approaches (in which individuals are sampled on their emotional experiences multiple times a day over the course of many days) to highly simplifies in-lab picture and scenario rating tasks (Erbas *et al.* 2014). In each of these types of studies, the correlation structure between emotion word use (across timepoints or experimental trials) to determine if words are being used in a

high information (i.e., non-interchangeable) manner. Yet these approaches may not be ideal for studying granularity in the judiciary, where the disruptive nature of experience sampling or the relative simplicity of stimuli of in-lab rating tasks are severe limitations. One potential solution may be to examine granularity for emotional contexts that are occupationally relevant. For example, researchers could generate realistic scenarios that tap aspects of emotional work in the judiciary. These could then be used as stimuli, and researchers could measure the emotional reports of judges in response. Indeed, the existing literature on emotion in the judiciary may provide the necessary qualitative data on which such measures could be constructed.

Second, it may be important to consider how situationally variable granularity may be in the judiciary. For example, lab-based studies that simulate the complexity of information that a judge must track in a courtroom and the cognitive demands that this may place on the individual are important to study. Recent evidence suggests that granularity may fluctuate within an individual based on how stressed they are (Erbas *et al.* 2018) and this pattern may be attributable to the cognitive decrements that accompany stress (Klein and Boals 2001, Kuhlmann *et al.* 2005).

Third, future work should examine whether granularity varies by level of experience, and judicial context. The very act of judging may lead to improved granularity over time. Given that the work of judging often requires engaging with, managing and even drawing on emotion as a source of wisdom (Maroney 2016), it is reasonable to speculate that this skill may develop over time in this occupation. Trial judges, in particular, must manage the emotional climate of an entire courtroom, including victims, witnesses, defendants, lawyers and juries. Knowing when management must occur and how to do so effectively will hone a judge's ability to deploy their knowledge about emotions in a precise and calibrated fashion (with granularity). In legal systems with career judges (i.e., civil law), granularity may be honed earlier, and perhaps to a greater degree, than for judges who are appointed relatively later in their careers as lawyers (i.e., common law).

Building on these fundamentals, there are several foreseeable avenues for additional work. Examining the impact of individual and situational variation in emotional granularity on decision making that has relevance to the judiciary would help to bridge the moral and economic decision-making tasks in prior research with the realities of judicial decisions. Another avenue for future work is investigating the long-term allostatic consequences of judicial practice. Over the long term, sustained stressors on the individual can lead to allostatic load (Juster *et al.* 2010). This type of load leads to ineffective allostasis, producing profound mental and physical health issues. The demands of judicial work likely place individuals at increased risk. It is not uncommon for judges to have repeated, intense and prolonged exposure to gruesome pictures and testimony in their work. Judges report experiences of secondary trauma and burnout in response to these conditions (Chamberlain and Miller 2009); this suggests that allostatic load is likely to develop in the judiciary over the long term. While the combined insights from literature on allostatic load and the nature of judicial work indicate that the judiciary may be at risk for health-related consequences of judicial work, direct evidence is lacking. This critical piece of evidence would underline the importance of cultivating granular emotions to serve in this occupation healthfully.

5. Recommendations for Promoting Granularity

While direct research on the topic of emotional granularity and judging is needed, it is possible to draw on the existing literature to provide empirically grounded recommendations for enhancing granularity in judicial practice.

Better Body-Budgeting. Proper regulation of bodily systems is one concrete way that emotional granularity can be improved and long-term allostatic burden of the occupation can be mitigated. Hormonal imbalances, sleep deficits and low metabolic resources can all contribute to demands on your body (McEwen 1998, Juster *et al.*

2010) that impact your interoceptions (Critchley *et al.* 2004) and can be experienced as affect (Craig 2015, Barrett 2017a, 2017b). This increased affective demand on an individual may in turn impact the tendency to engage in affective realism – imposing one's own affective state onto objects and events in the world (for example, Siegel *et al.* 2018b). Meeting sleep, nutritional, exercise and socio-emotional needs outside of the workplace are essential for mitigating potential detrimental effects of incidental affect. The implication is that the health behaviors of judges will have important consequences for their ability to perform their job effectively.

Words have power. The ability to explicitly label one's own emotional state can serve to reduce physiological responses in the periphery (for example, Kircanski *et al.* 2012). This may be critical when those responses are incidental to the situation at hand. This may also work when labelling other's states. When individuals perform tasks that require them to categorize other people's emotions with labels (as compared to broad affective categories like feeling good or bad) this is associated with less activity in the amygdala, a core hub of the salience network that is implicated in issuing visceromotor commands to the periphery and signalling uncertainty (Brooks *et al.* 2017). That is, labelling one's affective state impacts the neural systems that are involved in controlling the body and alerting other neural systems that there is ambiguity that needs to be resolved. Labelling can thus serve as an efficient means of resolving ambiguity about the source of one's affective changes.

Concepts are malleable. People gradually become more granular over time, indicating that emotional granularity is a skill that improves as experience with emotions accrues. Children generally start with highly undifferentiated use of emotion terms. Words like sad and mad are used interchangeably at first and over time become used to distinguish between different types of situations, non-verbal behaviors and internal perspectives (thoughts) (Widen and Russell 2008). In this sense, children are precise, but they are not complex. In adolescence emotion terms are used in more complex configurations (for example, anger and sadness are used together), but with poor precision (Nook *et al.* 2018). Finally, in adulthood, many individuals (but not all) learn to conceptualize their emotions with precision and complexity.

The developmental arc of emotional granularity is not simply fixed for individuals, however. That is, emotional granularity can be improved with intervention. In children, emotional granularity has been trained in intervention programs in the classroom (Hagelskamp *et al.* 2013, Rivers *et al.* 2013). In these programs, children are not only provided with examples of emotions (situational elicitors, behaviors, ways to communicate them, and ways to regulate), children are also encouraged to become more aware of their own affective state. That is, children are taught to "check in" with their affective state by charting their simple affective feelings (how good/bad and how activated/deactivated they are). These two features of this training program nicely parallel what we know about the structure of emotions. Individuals not only need to learn to attend to the sensations in their body, improving their interoceptive ability. Individuals also need to know how to interpret the signals from their body in a situationally appropriate manner, a mark of conceptual precision.

While training in adults has been less extensive thus far, even minimal training may have an impact on granularity. For example, a brief training of adults involved instructing individuals to focus on the subtleties of their feelings, including the multifaceted nature of some emotional events. Subjects then rated their emotional experiences (anger, disgust, fear, guilt and sadness) in response to a set of only six pictures. After this training, they showed reductions in misattributions of disgust (Cameron *et al.* 2013). An even less formal way that emotional granularity may be improved is via the simple act of reading literary fiction. Research suggests that reading certain types of fiction improve individuals' performance on theory of mind

tasks, including the ability to infer emotions in others (Kidd and Castano 2013).[3] We can speculate that the mechanism behind these effects is the refinement of emotion concepts into more granular ones. In the judicial context, reading about and discussing the experiences of others in the judiciary, as they are tied to the occupation may be particularly impactful. This would necessitate a shift in norms, however, toward more transparency and acknowledgement of emotion in judicial practice in the first place (Maroney 2016); this shift that must confront the strucrural nature of the emotional regime in the courtroom (Bergman Blix and Wettergren 2016).

Concept training tuned to context. Importantly, there is not a "single" emotional repertoire that universally constitutes granular emotional experience. Instead, there can be many formulations that are based on the culturally defined meanings (De Leersnyder *et al.* 2011, 2014, 2015, Mesquita *et al.* 2016). The emotions that are valued and cultivated in a given culture vary (Tamir *et al.* 2016). As a result, the task of a granular individual is to understand the systems of emotional meaning that are most relevant based on shared culture.

It may be of some value to not only think about culture at a national or ethnic group level, but to think of the legal system as its own cultural system. Certain emotions may be more valued in the legal context (e.g., righteous anger, empathy, and remorse) whereas others may be less valued (e.g., envy, hubris, disgust) (Bergman Blix and Wettergren 2016). Further, the manner in which emotions are expressed (verbally and non-verbally) may be quite distinct inside a courtroom. For example, it is plausible that a defendant might withdraw in an intimidating institutional context and fail to fulfil expectations regarding appropriate behavior (such as expressions of remorse) as a result. It is not only important to think about how training might be useful to enhance the emotional granularity of judges, but also how that training should be tuned to the culture of a particular legal system. Of course, cultural systems are not static nor are all norms and values productive. Aspects of culture can outlive their initial utility (Boyd *et al.* 2011). It may be that a more granular accounting of emotions in the legal system will provide opportunities for debate and cultural change as well (Wilson 2016).

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[3] Several replications have yielded variability in the robustness of this effect, however (Pino and Mazza 2016, van Kuijk *et al.* 2018), suggesting that this effect may depend on the degree and type of exposure to fiction (Kidd and Castano 2017a, 2017b).

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