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On Rupture: Establishing the Cognitive Bases of Social Change

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This article presents a cognitive model of social rupture and develops its implications for social change processes. It takes as its foundation established research on the reflexive transition from implicit (i.e., Type 1) processing into conscious (i.e., Type 2) processing that occurs when individuals' automatic inferences about their environment become unreliable. By considering how this "conflict monitoring response" (Botvinick et al. 2001) and its associated cognitive and affective effects play out within social contexts, this work establishes a general, cognitive model of social rupture that converges significantly with classic sociological perspectives on the subject. The second half of the article mobilizes the developed model to establish the cognitive bases of social change processes as they manifest across societal scales, from the intrapersonal to the macrosocial. After foregrounding key implications that follow from this socio-cognitive perspective of social change, this work concludes by providing a general framework for how the presented model can be used to develop new empirical approaches for studying real-world social change as it unfolds via individuals' implicit sensemaking processes.

KEYWORDS: cognition; dual process models; theory; sensemaking; rupture; social change.

"All that you touch you Change. All that you Change Changes you. The only lasting truth is Change."

—Octavia E. Butler, from *Parable of the Sower*

INTRODUCTION

By definition, experiences of rupture arise from individuals' encounters with the unexpected or abnormal. At a microinteractional level, "breaches" can be produced by violations of the "normal forms" of social interaction (Garfinkel 1967; Goffman 1983; Tavory and Fine 2020). At the societal level, *en masse* experiences of rupture characterize "unsettled times" (Sewell 2005; Swidler 2001) and arise in response to exogeneous shocks (e.g., environmental disasters, a global pandemic), or emerge from endogeneous factors like the rapid reconfiguration of social relationships brought on by industrialization (Durkheim 1951), the destabilization of political institutions in the face of regime change (Ermakoff 2015; Jansen 2017; Sewell 2005) or fundamental shifts in a culture's shared sensemaking brought about by social movements (Benford and Snow 2000; Habermas 1984). While typologies of social rupture can be constructed across a variety of dimensions, its quintessential feature remains the experience itself—that of encountering some element in the social world

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so unusual and unanticipated, its very foreignness corrodes the background sense of normalcy (Zerubavel 2018) that ordinarily characterizes one's existence. Consequently, a complete understanding of social rupture—and the varieties of social change which invariably involve it—requires us to go beyond cataloging its external causes and turn inward, toward the fundamental mechanisms responsible for the experience itself.

This is the task this work sets before itself. Specifically, it will endeavor to "mine the intersections of cognitive sociology and neuroscience" (Cerulo 2010) to identify the cognitive processes responsible for the social rupture experience. Of central concern will be individuals' reflexive transition from an automatic, implicit navigation of their environments into a more conscious, effortful engagement with them that occurs when there are significant failures in their automatic processing (Botvinick 2007; Botvinick et al. 2001; Braver et al. 2007; Kahneman 2011; Lieberman 2007). This work will mobilize this empirically grounded understanding of the "conflict monitoring response" (Botvinick et al. 2001) to define the general conditions which induce social rupture and identify both the experiential and collective consequences that follow therefrom. It will then use this socio-cognitive model of rupture to establish the cognitive bases of social change processes as they manifest across societal scales, present some major implications thereof, and briefly outline how this model can be used to develop new empirical approaches to the study of real-world social change processes.

THE COGNITION OF SOCIAL RUPTURE

A central contribution of cognitive sociology has been its integration of "dual-process" models into our understanding of social processes (Leschziner 2019; Lizardo 2017; Lizardo et al. 2016; Vaisey 2009). These models counterbalance historical tendencies in social explanation to overemphasize consciously accessible, reflective, and deliberative aspects of human behavior (Camic 1986; Leschziner and Green 2013) by emphasizing the substantial degree of human information processing and behavior formulation that occurs via fast, reflexive, and implicit (i.e., consciously inaccessible) processing. Prior work has conceptualized these different classes of cognitive processes as different "systems" (Kahneman 2003, 2011) or "types," with Type 1 processes referring to the primarily fast, parallelized, intuitive, and largely unconscious elements of cognitive processing and Type 2 referring to the comparatively slow, serialized, deliberative, and consciously accessible aspects of it (Wason and Evans 1975; West and Stanovich 2000). Invocations of dual-process models can unintentionally tend toward an inaccurate reification of the independence of these constructed classes of cognitive processing from one another (Evans and Stanovich 2013; Leschziner and Green 2013). The empirically well-confirmed consensus, however, is that these processes work in tandem and exert significant mutual influence on one another.

To date, importations of dual-process models into sociology have had a strong focus on mapping different levels of processing to various aspects of social, specifically cultural, phenomena. Notable examples in this regard include invocations of

the dual-process model to rectify tensions between more "justificatory" versus "motivational" models of culture (Vaisey 2009) and vital theoretical work delineating between "declarative" versus "nondeclarative" culture (Lizardo 2017). Related lines of research have further considered how individuals' implicit sensemaking processes might provide the foundation for more general theories of culture (Foster 2018; Shaw 2015), while other work has focused on the role of Type 1 processing in specific social phenomena, including nonverbal learning in the transmission of practices (Lizardo 2007), the effect of unconsciously applied schema in structuring social perception and information spread (Hunzaker 2016; Hunzaker and Valentino 2019; Wood et al. 2018) and the influence of embodied or sensory processing on social sensemaking (Cerulo 2015, 2018; Leschziner 2015; Leschziner and Green 2013). Sociologists have also begun using these cognitive insights to develop new empirical approaches for studying social phenomena, like those identifying the immediate relevancy of psychological methods for assessing implicit associations (e.g., the Implicit Association Test (IAT) (Greenwald et al. 1998) to the study of culture in context (Miles et al. 2019; Shepherd 2019; Shepherd and Marshall 2018) and the development of new quantitative methods for assessing internal belief structures (Boutyline and Vaisey 2017).

As reflected in this brief review, the profound ability of Type 1 processes to shape conscious awareness and action from the "bottom-up" have become increasingly central in explanations of social behavior. To date, there have been relatively fewer considerations of the "top-down" pathways by which Type 2 processes may intervene upon Type 1 processing (though see (Leschziner and Green 2013)). Part of this unevenness reflects a correction to the aforementioned historical overemphasis of individuals' conscious actions in social theory. Further, while treatment modalities such as cognitive-behavioral and mindfulness-based therapies has provided *practical* understanding of these topics that have been of tangible benefit to individuals, formally established *theoretical* perspectives in these fields have resisted transportation into sociological theory. In spite of these and other potential explanations for the relative de-emphasis of "top-down" effects,they remain as important as their "bottom-up" counterparts to the explanation of social phenomena. As will be established here, one such "top-down" pathway in particular, that of the "monitoring" functionality of Type 2 processes over Type 1 processing, will prove fundamental to understanding social rupture and the related cognitive bases of social change.

The Conflict Monitoring Response

On a moment-to-moment basis, reflexive cognitive processing continuously filters and interprets environmental information. Before a conscious impression of an experience has formed, Type 1 processes have generated innumerable inferences about what aspects of the environment require conscious attention, how stimuli should be interpreted, and what is likely to happen next. Without this strong prestructuring of experience, the comparatively limited bandwidth of our conscious processing would be incapacitated by the chaos of sensory input it receives. With these Type 1 inferences in place, Type 2 processes are freed to engage in the slower, more thorough, and deliberative processing associated with tasks like logical reason-

ing, conscious decision-making, and intentional action. These gains in functionality depend heavily, however, on the validity of the automatic inferences being supplied. In the (quite literal) normal course of events, the level of inferential accuracy required for successful higher-level processing may not be that high; inferences need only be "good enough" to allow individuals to reliably navigate what is occurring. Small errors in automatic inferences—the misreading of a number as a letter or the misidentification of a distant sound—will rarely impede an individual's ability to function at any giving moment. In reality, the constant stream of automatic sense-making that conscious awareness floats upon may well brim with inconsequential mistakes we will never know we have made.

While minor errors may be glossed over with impunity, other Type 1 mistakes are more consequential. A set of fast, reflexive inferences leading one to mistake a poisonous snake for a wooden stick or a stranger's expression of hostility for one of friendliness offer just two examples from a universe of potentially fatal errors that can and have been made in this arena. Higher-level, deliberative processing would not be possible without the substrate of automatically supplied inferences it rests upon. It would also, however, be critically disadvantaged if it were strictly bound to accept the reality presented to it by Type 1 processing. It is in this context that one of the core functionalities of Type 2 processing, its capacity to act as a "monitor" over Type 1 proceses, proves essential (Botvinick 2007; Botvinick et al. 1999; Braver et al. 2007; Kahneman 2011).

Convergent lines of research from multiple disciplines have established the existence of this monitoring functionality. The most foundational findings come from neuroscientific studies of a brain region located in the frontal lobe, the anterior cingulate cortex (ACC). A large body of experimental research has confirmed the ACC is activated when "conflicts" in the automatic processing of information arise and that this activation is associated with a reflexive redirection of effortful, deliberative attention to the expectation and response formation processes that were previously being handled through implicit processing (i.e., a situationally adaptive exertion of "cognitive control") (Botvinick 2007; Botvinick et al. 2001; Braver et al. 2007; Carter et al. 1998; Yeung 2015; Yeung et al. 2004). In this context, "conflict" refers specifically to an "interference or interactions between different information processing pathways" (p.825 Braver et al. 2001)—in effect, circumstances wherein multiple, incompatible automatic interpretations or responses have been activated and are competing with one another for dominance. Using a variety of study designs and well-established, low-level experimental stimuli such as the Stroop task, Flanker task, and Go/No-go response tasks, researchers have established a central set of situations that evoke this type of cognitive conflict (Botvinick 2007). Included within this set are situations in which individuals are explicitly required to override automatically supplied responses or need to formulate responses in "underdetermined" (i.e., ambiguous) contexts, and situations in which individuals commit errors in the course of executing their automatic responses (Botvinick 2007; Botvinick et al. 2001). More recent work has further generalized the conflict monitoring response and associated ACC activation to experiences of "surprise", or more exactly, situations in which individuals' automatically generated expectations of what is and will happen are invalidated (Alexander and Brown 2011; Egner 2011; Vassena et al. 2017, 2020).

Exceptional care must be taken when moving from fine-grained neurological models and neuroscience experiments to the larger and more generalized contexts of interest to sociologists. Noting the activation of a brain region during performance of the Stroop task is in no way sufficient to fully characterize individuals' lived experiences of social situations. Nonetheless, recognizing that conflict in implicit processing cues a reflexive shift of conscious attention provides a critical opening for understanding the cognitive mechanisms underlying the experience of social rupture. Most centrally, it provides an empirical foundation for asserting that in social situations characterized by either a pronounced misalignment between what is happening and one's implicit inferences or ambiguous signals that cue multiple, incompatible automatic interpretations, there will be an increased likelihood of individuals' conflict monitoring responses being activated. Further, it allows us to hone in more exactly on the cognitive and affective effects individuals are likely experience as a result of this activation.

Experiential Signatures of the Conflict Monitoring Response

The first-person experience of the conflict monitoring response is a familiar one. Consider the common experience of driving along a familiar route, say home from work or to one's usual grocery store. With sufficient repeated experience, navigation of these routes can be handled via well-habituated Type 1 processes to a degree that one's conscious attention can be diverted almost entirely elsewhere, say to the mulling over of the day's events or to listening to the news. If, however, one inadvertantly takes a wrong turn for some reason, the sudden divergence between one's implicit expectations/predictions of what should be happening and what is actually occurring will reflexively trigger the monitoring functionality of Type 2 processing. This will be experienced as a sudden redirection of one's conscious attention away from whatever train of thought had been occupying it, toward a deliberative reevaluation of situational elements that were previously handled via automatic processing. Without making any purposeful decision to do so, the individual will find themselves consciously reassessing where they are and applying deliberative effort to figure out what they need to do next. This cognitive experience may also be accompanied by unpleasant emotional responses such as a vague sense of discomfort, anger, or anxiety.

Although a trivial example in many respects, this vignette illustrates key experiential signatures of the monitoring response. First and foremost, is the dramatic shift in what aspects of the situation are most salient to conscious awareness. Specifically, there is a rapid reversal of what had previously been processed as perceptual "ground" (Zerubavel 2015) being drawn to the forefront of awareness and a complementary recession of what had previously been "figure," whatever one had just been thinking about, into the cognitive background. Alongside this transition will be an impetus to redirect newly freed Type 2 resources toward consciously reevaluating aspects of the situation that had previously been handled unconsciously. Finally, concordant with research confirming the interrelationship of negative affective responses and these types of reflexive impositions of adaptive cognitive control (Bot-

vinick et al. 2004; Dreisbach and Fischer 2012; Fritz and Dreisbach 2013; Ichikawa et al. 2011), there may also be aversive emotional shifts associated with moving from a state of "cognitive ease" to one of greater "cognitive strain" (Kahneman 2011).

This transition from implicit to deliberative processing is not permanent, however. Per the principle of "cognitive miserlieness" (Fiske and Taylor 1984) or what has been referred to as "the law of least cognitive effort," (Botvinick et al. 2001), individuals' cognitive processing is inherently driven to offload as much work as possible back onto Type 1 processes after Type 2 processing has intervened. In the context of the current example, such a shift might be facilitated by applying conscious effort to return back to one's familiar route. In other circumstances that involve highly unfamiliar or unstable environments, attempts to reimpose existing implicit models may fail at reducing processing conflict. Under these conditions, the same principles of cognitive least effort will continue to hold but will require more time and effort to accommodate. Just as a job relocation may initially involve a sizeable outlay of conscious resources to learn a new driving route that will ultimately become rote, processes related to habituation and procedural learning help ensure that with enough time and environmental stability, a new, cognitively easeful normal will emerge.

A Cognitive Model of Social Rupture

While the discussed cognitive mechanisms related to the monitoring functionalities of Type 2 processing exist at the individual level, they provide a foundation from which a highly generalized model of social rupture can be developed. Most centrally, these processes allow us to precisely define, *a priori*, the conditions under which individuals become more likely to reflexively transition into a more conscious engagement with aspects of their experience that are usually taken-for-granted. This same foundation also makes it possible to develop further predictions concerning the cognitive and affective signatures that are likely to characterize these experiences. This basic cognitive foundation also provides a basis for explaining post-rupture "renormalization" processes wherein, given enough time and experiential stability, individuals will develop a new set of taken-for-granteds to structure their conscious experience. To translate these promising cognitive foundations of *individual* experiences of rupture into a fully realized model of *social* rupture, however, requires one final step.

Many concepts have been evoked in discussions of the unconsciously imposed meaning structures individuals rely upon to make sense of the social world (see Wood et al. (2018), Hunzaker and Valentino (2019) and Boutyline and Soter (2021) for more comprehensive overviews). Broadly speaking, these varying conceptions can be said to fall under the highly general heading of implicit mental representations (Payne and Cameron 2013; Shaw 2015). These mental representations, and the associative networks underlying them, encode common patterns individuals have repeatedly encountered in their prior experiences (see (Lizardo 2017) for a more thorough discussion). It is through these previously learned patterns of association that Type 1 processes are able to automatically generate the implicit interpre-

tations and predictions (i.e., inferences) that structure consciously accessible experience.

Translating this concept of mental representation into the present discussion, we can assert that the probability of an individual's Type 2 monitoring response being invoked increases as the inferences produced by an imposed mental representation are disconfirmed (i.e., invalidated) by the environment and/or ambiguous signals from the environment cause different, competing mental representations to be cued. Revisiting the previous example, one's ability to expend minimal conscious effort while driving home from work is made possible through established mental representations of the route that provide the automatically supplied inferences, expectations, and responses required to navigate it. Environmental feedbacks that might disconfirm those representation-derived inferences could come in the form of seeing a set of houses that are a different color and shape than what was unconsciously expected. Experiencing this along with other similar disconfirmations may in turn, produce a level of processing conflict sufficient to trigger the monitoring response that would ultimately lead one to consciously realize they had made a wrong turn.

While internally, implicit processing via mental representation may function similarly across nonsocial and social contexts, prior work has identified the existence of a fundamental level of interdependency of representations in social contexts that is not present in nonsocial settings (Shaw 2015). To briefly illustrate this interdependency, consider an individual in a social interaction. In navigating this experience, she will automatically impose her own mental representation of the interaction and rely upon the automatic inferences it provides to structure her understanding and behaviors within it. A primary source of environmental feedbacks that will confirm or disconfirm her imposed representation of the situation (i.e., validate or invalidate her automatic inferences) will be the behavior of others in the situation. Simultaneously, every other individual in the situation will be undergoing their own versions of the same process of representation imposition and confirmation/disconfirmation. Ultimately, the ability of each group member to off-load the navigation of the social situation onto their Type 1 processing will not be determined by their application of an *objectively correct* representation of the situation, but instead, by the individuals' collective capacity to synchronize on applying *intersubjectively congruent* representations of what is occurring. This fundamental interdependency in individuals' automatic processing of social situations constitutes an essential "self-fulfilling prophecy" (Merton 1948) dynamic that is continuously playing out, on an unconscious level, across social life.

Bringing this fundamental dynamic to bear on the current discussions of conflict monitoring responses yields the following general model of the cognition of social rupture (see Fig. 1).

Several core assertions follow from this model:

1. Social rupture occurs when *social environment feedbacks trigger the conflict-monitoring response of individuals*. This response is induced by the *invalidation of individuals' automatically generated inferences* about the social situation (i.e., disconfirmation of their imposed mental representation of it). This invalidation may

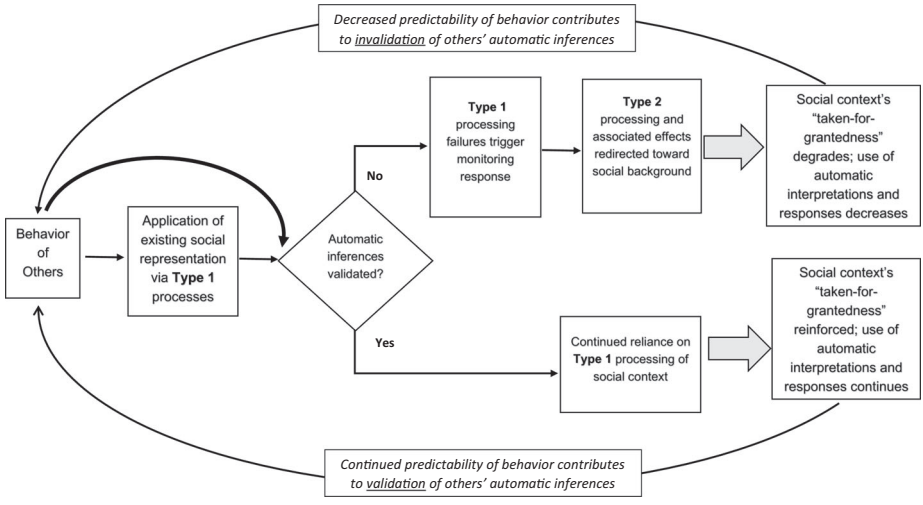

Fig. 1. The Cognition of Social Rupture.

occur directly or through the production of conflicting inferences arising from ambiguous environmental signals (i.e., the cuing of multiple, incompatible representations to the situation).

2. Once individuals' conflict-monitoring responses have been triggered, processing of the social context is expected to shift toward relying upon Type 2 resources. *Cognitive and affective shifts* associated with this response are also likely to be directed toward sources of invalidating feedbacks.

A. The expected *cognitive effects of rupture* include *an automatic shifting of individuals' conscious attention* away from the previous objects of individual or joint deliberation and towards previously taken-for-granted elements of the social situation, most specifically those related to Type 1 processing failures. This reflexively increased *conscious saliency* of disruptive elements may be further accompanied by *increased expenditures of cognitive effort* on their reevaluation.

B. *Affective reactions* associated with the monitoring response may further inflect individuals' experiences of social rupture. Specifically, associated *aversive emotional responses* may accompany cognitive shifts in attention and effort.

3. As a ruptured social context persists, individuals' diminished ability to rely on the automatic inferences and behavioral responses supplied by their Type 1 processes may lead to *decreasing predictability in their behavior* as they are forced into a conscious reengagement with their situation. These declines in predictability may in turn, *produce new sources of invalidating feedbacks* for others' Type 1 processing—rupture may beget further rupture.

4. Per the dictates of *cognitive miserliness*, individuals will, generally, be driven to return disrupted contexts to a state requiring less conscious effort to navigate. They may employ strategies of *repair* (Goffman 1959) that realign the social context with existing representations or *reestablish* new representations of it

over time. This innate propensity will act as a force of *renormalization* that drives social contexts back toward a state of implicitly processed normalcy. Subsequent *resumption in the predictability of individuals' behaviors* will serve to *reinforce the taken-for-grantedness* of the newly restored or rebuilt social context—normalization will beget further normalization.

This cognitively derived model of social rupture shares notable resonance with several lineages of existing sociological work. Especially encouraging are points of convergence it has with sociological traditions that emphasize taken-for-grantedness and social rupture in the context of individual and small group interactions (e.g., (Berger and Luckmann 1966; Blumer 1969; Garfinkel 1967; Goffman 1959, 1983; Schutz and Luckmann 1973; Strand and Lizardo 2017; Tavory and Fine 2020)). In addition, this model remains firmly agnostic to the scale of social context being considered. Its resulting amenability to application across social "levels of analysis" (Jepperson and Meyer 2011) creates additional opportunities for connecting this model to theories centering taken-for-grantedness and social rupture in macro-social processes (e.g., (Berger and Luckmann 1966; Bourdieu 1972, 1984; Douglas 1986; Habermas 1984; Jansen 2017; Sewell 2005; Swidler 2001).

These commonalities aside, the universality of the cognitive processes at the center of this model and the high generality of its core assertions help to distinguish it from prior work, specifically in the breadth of its implications and the potential to develop a wide set of potential applications from it. A full exploration of these theoretical elaborations goes well beyond the scope of the current work. As will be shown, however, these specific qualities of universality and generality will prove especially vital in mobilizing this model toward the establishment of the cognitive bases of social change processes.

THE COGNITIVE BASES OF SOCIAL CHANGE

In identifying the central role of environmental feedbacks in either reinforcing or disrupting the implicitness of social backgrounds, this socio-cognitive model directly contributes to our understanding of social change. Independent of their specific contents, when feedbacks from the social environment validate individuals' automatic inferences, they reinforce the taken-for-grantedness of the social orders that are related thereto. So long as these elements of the social background remain embedded in individuals' automatic processing, they will continue to unconsciously structure individuals' experience of social reality and shape their actions within it. Conversely, when environmental feedbacks invalidate individuals' Type 1 processing of a social context, they can serve to destabilize related social orders by increasing their availability to conscious consideration—an arena in which they become more vulnerable to purposeful reevaluation, reconfiguration, or rejection. The following sections offer a more systematic elaboration of this fundamental connection between the cognition of social rupture and social change processes, as it manifests across different societal scales.

Social Change at the Intrapersonal Level

Informational environments not only include the external world, but the inner one as well. Given this, there is arguably no source of feedbacks so essential to the reinforcement or disruption of a prevailing social order than one's own inner lived experience. For those possessing a psychological organization, innate desires, or physical embodiment congruent with prevailing social representations of personhood, misalignments between one's experience of self and the implicit processing thereof may be relatively rare and ephemeral. For those who are not so well-aligned with their socially inherited, take-for-granted expectations of self, personal experiences of social rupture may be a constant feature of existence. Only experiencing sexual attraction to the opposite sex within a strictly heteronormative society grants one the ability to navigate huge swaths of social life in a highly automatic, cognitively easeful fashion. To experience mostly same-sex attraction in that same society is, conversely, to live in a state of continuing conflict between one's socially structured Type 1 processing of sexuality and one's own embodied experiences. Sexual attraction reflects but one of a vast number of dimensions along which *intra*personal realities may be fundamentally incompatible with inherited social representations.

In some contexts, these representations may not even admit for the possibility of an individual's lived experience. This constitutes a form of erasure at the level of automatic sensemaking and entails that nonconformant individuals will be regularly required to expend more of their limited Type 2 resources navigating social contexts that others move through unconsciously. In other circumstances, socially provided representations may prove unreliable and inaccurate when applied to the structuring of one's own experience. In societies strongly organized by racial and gender power hierarchies, ascribed membership to a nondominant class invariably comes with implicit expectations of the traits an individual can or cannot possess. If a woman with an aptitude for math exists in a social order with a strict, unvarying association of quantitative intelligence with masculinity, for instance, she will experience conflicts between competing mental representations of herself that her male counterparts will never encounter.

For individuals living in these states of on-going rupture, the essentialized facts processed as self-evident truths by the majority have a greater likelihood of becoming subjects of conscious awareness. In this way, deeply taken-for-granted and naturalized features of socially constructed realities (Berger and Luckmann 1966) may be organically driven from the comparatively protected domains of automatically reproduced, nondeclarative culture (Lizardo 2017) into cognitive arenas where they are more likely to be deliberatively questioned and reevaluated. For those unable or unwilling to directly challenge the cognitively problematic taken-for-granteds of the social orders in which they are embedded, the main goal of this deliberative effort may focus mostly on personal survival within cognitively strained social milieus. In other contexts, these conscious efforts may turn outward, toward formulating explicit critiques of the established social order or articulations of possible alternative social realities. In any case, these individual experiences of rupture and the expenditures of deliberative effort they require will constitute a fundamental source of variability in how the social order is individually instantiated. As anticipated in classic

work on deviance (Durkheim 1951), there are compelling reasons to believe that the presence of this type of variability in the automaticity of social life may prove critical to the long-term adaptability of social systems (Page 2007; Shaw 2015).

Focusing on the cognitive and affective impacts of social rupture at this intrapersonal level also brings to the fore specific and vital points of resonance between this work and work in the Duboisian tradition on concepts related to "double consciousness" and "second sight" (Du Bois 1903). Du Bois' description of ever feeling one's "two-ness," the conflicting understandings of self garnered from lived experience versus the dominant classes' imposed perspectives, and his assertions concerning the incongruencies of Black Americans' experience increasing their ability to identify White America's blindspots, find new layers of cognitive implication in the current context. Further, his frank examinations of the increased burdens which accompany these experiences draw to the front a critical implication of this socio-cognitive perspective. Per the expectations of this model, we anticipate that the failings of a social order to adequately account for one's lived experiences will translate into a sustained, increased risk of experiencing the aversive emotional responses associated with failures in Type 1 processing (e.g., feelings of unwellness, anxiety, and unsafety). The presence of these persistent detrimental influences on mental and emotional well-being, in conjunction with the increased cognitive demands that have also been identified, offers yet another indication of how intimately the impacts of systematic inequality are felt.

In a more ideal world, individuals' incongruency with prevailing taken-for-granteds would be acknowledged as the important contributor to collective resiliency they are and the increased experiential costs associated therewith would be proactively recognized and mitigated. History has, unfortunately, been characterized by quite opposite tendencies. Consequently, we are obliged to recognize that while tangible progress may have been made toward the development of more inclusive social orders that better enfranchise the true spectrum of humanity's lived realities, these advances have been paid for in the very real suffering and existential uncertainty of an uncountable number of individuals who have had no choice but to deliberatively seek out alternative conceptions of social reality.

Social Change at the Interpersonal Level

When interpersonal interactions are well-ordered, participants are able to offload enough of the structure of interaction to Type 1 processing that the bulk of their conscious effort can be directed toward "within frame" (Goffman 1974) matters (e.g., conveying verbal information or explicitly coordinating within one another to achieve a common task). In interactions that are not well-ordered, misalignments between participants' unconscious representations of the situation impede their ability to rely on automatic processing. Consequently, their conscious attention is more likely to be redirected toward more "out of frame" considerations related to the interactional structure itself (e.g., expending more deliberative effort interpreting another's movements or reevaluating their assumed motivations). Concordant with the (dubiously gleaned) findings of ethnomethodlogists' "breaching experiments" (Garfinkel 1967), this rupturing of the interactional order is generally expected to be

met with aversive emotional reactions and a strong shared drive to return the interaction to more predictable footing.

Examples can be found of single instances of either accidental or strategic interpersonal rupture precipitating larger scale social change. We might specifically anticipate that such singular points of rupture are likely to have their greatest impacts in social contexts already characterized by high levels of contingency or indeterminacy (Ermakoff 2015; Shaw 2015). Nevertheless, the majority of social ruptures that have occurred at this interpersonal level have undoubtedly been so ephemeral as to leave little discernable trace. When considered from a more structural perspective, however, the present socio-cognitive model helps us identify circumstances under which these interpersonal ruptures may be produced with sufficient regularity and scale to drive larger social change processes. Most notably, it allows us to foreground the importance of structural conditions that lead individuals from different social realities to be placed in on-going contact with one another.

An obvious demographic force responsible for creating this type of structural condition is that of migration. In contexts where migration patterns support the formation of communities of individuals arriving from similar origins, the resulting interactional landscapes can take on an especially rich texture. Per what we know of cognitive processing, we can expect that members within these types of communities to reflexively transplant many elements of their originating social contexts into their new context. Due to factors ranging from differing material circumstances to institutional constraints, however, many of these elements may ultimately prove incompatible with the new setting. If these incompatibilities are pronounced enough to produce disruptions in community members' Type 1 processing, relevant features of their originating contexts may become more available to conscious reconsideration and deliberate choices can be made regarding their abandonment or creative reworking. As communities become established and members continue to interactionally reinforce each other in their developed adaptations, the basis is laid for a new social order that is distinct from the ones that characterized either their originating or receiving contexts.

Concurrent with these intracommunity processes, the continuing necessity of interacting with outside groups provides further settings for on-going rupture. At their most generative, these standing interfaces between different social realities can give rise to richly creative milieus wherein interactional frictions expand participants' conceptions of social possibilities and promote conscious reevaluations of their own inherited taken-for-granteds. Interestingly, these kinds of generative qualities have long been associated with cosmopolitan contexts that are strongly characterized by just these types of interfaces. As touched on at the intrapersonal level, the ability of these standing interfaces to encourage exploration and experimentation of alternative social orders may be linked to the long-term robustness and adaptability of the larger social system - a realization that arguably supports the protection of this these spaces of socio-cognitive diversity within social systems for reasons that parallel those related to the protection of biodiversity in ecosystems (Page 2007).

For all these possible benefits, however, the pressures of cognitive miserliness and the discomforts of cognitive strain inherent to the collision of lifeworlds (Schutz and Luckmann 1973) make it clear that not all, nor even most, of the interactions

along these interfaces will be of this creatively heightened nature. If nothing else, the demands of daily life simply require a much higher degree of interactional efficiency. One pathway for managing these demands is the development of narrow interactional scripts for handling frequently encountered situations with outgroup members. With sufficient repetition, these routinized interchanges can be at least partially off-loaded to Type 1 processing. The narrowness of these scripts and their relatively shallow characterization of outgroup interactional partners, however, may act to reinforce rather than challenge stereotypical representations thereof (Allport 1954). Nonetheless, the development of these thinner interactional orders are likely to be vital to the functioning of diverse social systems and can provide a basis for achieving common goals in the face of significant differences in implicit understanding in a manner that resembles Durkheim's (1933) conception of "organic" (contra "mechanical") solidarity.

Another central strategy for managing interpersonal interactions across these types of standing interfaces may be to designate specific community members to act as "brokers" (Stovel and Shaw 2012) between in and out groups, a tactic that has been well documented in immigrant communities (Orellana 2009) as well as other communities that maintain a strong separation between themselves and the larger social systems in which they exist (e.g., Mennonite communities) (Gingrich and Lightman 2004). In this type of arrangement, brokering individuals essentially take onto themselves cognitive strains that would otherwise be distributed more broadly across the community. The increased cognitive effort associated with this position may be partially mitigated through formally structured roles that guide how outgroup interactions should be handled. The experiential strain of a brokerage position may also lessen over time as brokers develop their own personal representations for navigating outgroup contexts and code-switching between cultural contexts (Molinsky 2007). The current model also anticipates that the unconscious taken-for-granteds characterizing both the outgroup and the ingroup social orders will generally be more accessible to these brokers' conscious awareness than they are to other group members. The expanded social perspective that might result from this may or may not be welcomed by a broker's ingroup, especially when there are heightened fears of the brokering individual being "captured" by the outgroup (Stovel et al. 2011).

While the foregoing discussion has centered its considereation on physical migration and the associated interfaces it produces within geographic/residential space, the presented insights translate directly to the standing interfaces that exist between social groups generally. The current model would posit, for instance, that the interpersonal code-switching utilized by a first-generation academic moving between professional settings and her family of origin will recruit similar cognitive processes as are employed by brokers in immigrant communities. Similarly, the creative vibrancy generated from on-going interactional ruptures between different ethnic groups in cosmopolitan settings may share its cognitive origins with the increased innovation associated with interdisciplinary settings. Although drawing explanatory parallels across substantive arenas should always be undertaken with caution, the ability to extend basic insights on the connection between interpersonal rupture and social change to such disparate social domains demonstrates some of the core benefits of pursuing this type of general, socio-cognitive model.

In moving from the intrapersonal to the interpersonal, the possibility of individuals not only experiencing rupture but becoming a source of rupture to others becomes prominent. This shift comes with a final set of critical implications for social change processes. When the presentation or behavior of a person significantly misaligns with the automatic social inferences being applied to them by others, the mere presence of said individual may be sufficient to trigger the conflict monitoring responses of their interactional partners. The experiential implications of this response entail that these representationally nonconformant individuals may face several unwanted interactional consequences, even in the most neutral of interpersonal settings. These consequences may include becoming disproportionately salient in others' conscious awareness (i.e., the person will "stick out"), an undesirable redirection of others' conscious attention away from interactional content toward scrutinization of one's self, and becoming a focal point for others' aversive emotional responses (e.g., becoming the target of feelings of unease, dislike, or distrust).

These negative interactional impacts could conceivably be mitigated through a combination of awareness and structural supports. Our social reality remains far from this state, however. To the contrary, the intimate entwinement of power structures with taken-for-granted social logics (Bourdieu 1984; Sewell 2005) entail that interactional ruptures which specifically challenge established social hierarchies are primed to become sites of interpersonal aggression and violence. In a social order that strongly associates inherent traits and social worth with one's ascribed biological sex characteristics at birth, for instance, someone who has been assigned to the male category presenting in a feminine manner may not only disrupt others' Type 1 processing of an interaction, but the very structure of their social reality itself—an affectively loaded situation which readily escalates rupture-induced feelings of unease into outright perceptions of threat. This added emotional weight, in conjunction with the increased conscious saliency of nonconforming individuals, heightens their risk of becoming a target of psychological and physical violence by interactional counterparts who are seeking to recuperate their ruptured social order by eliminating the perceived source of its disruption.

Even when the risks of direct physical harm may be relatively reduced, the costs of social change remain unevenly distributed within interpersonal arenas. To consider an example of direct relevance to higher education institutions, we can consider societies like the United States whose organization continues to depend heavily on racialized hierarchies of power distribution (Kendi 2019) but that have also seen increased numbers of BIPOC individuals entering into historically white settings of power (e.g., corporate leadership, political office, academia). While these numerical shifts may be occurring, they are taking place within a wider social context that continues to reproduce and reinforce established implicit associations (Greenwald et al. 1998; Shepherd 2019) linking racialized phenotypic traits to differences in intelligence, authority, and competency. This persistent shaping of individuals' Type 1 processing is fundamentally at odds with the presence of nonwhite individuals in these historically white settings of power. This model directly anticipates that a result of this systemic mismatch will manifest as nonwhite individuals consistently facing increased interactional burdens within these settings, including a persistent pressure to proactively repair or "smooth" over others' experiences of rupture in a manner

not required of their white counterparts. It also anticipates that these individuals will be at increased risk of becoming the target of implicitly activated, negative emotional responses. While the disproportionate expenditure of interpersonal labor required to persevere within these settings may be crucial to eventually establishing new social orders wherein the presence of BIPOC individuals is processed with the same cognitive ease as their white counterparts', the unevenly distributed psychological costs exacted by these interactional milieus remain substantial in the present—and all too frequently, unacknowledged.

Social Change at the Macrosocial Level

Social change at the macrosocial level expands the present consideration to those conditions capable of inducing rupture experiences *en masse*. Congruent with historical emphasis on the ability of exogeneous shocks to produce social change, an obvious source of widespread rupture are large-scale catastrophes such as major environmental disasters—or global pandemics. The origins, magnitude, and nature of these shocks vary, but they can be commonly characterized by their ability to profoundly disrupt the predictability of social life.

These disruptions may come in the form of sudden changes to the previously stable material conditions that undergirded social life (e.g., food shortages, supply chain disruptions, the destruction of physical structures) or through direct interference with a society's bases of collective organization (e.g., failure in telecommunications systems, loss of family members, an inability to physically gather). These types of exogeneous shocks may also set off expanding fronts of destabilization that lead to a compounding disintegration of the automaticity of social life. The need to impede the spread of a fatal new virus by wearing masks and practicing social distancing, for instance, draws unconsciously enacted interaction rituals into the (often awkward) fore of conscious reconsideration. Unquestioned assumptions concerning the feasibility of remote work also become subject to deliberative reevaluation, and automatic moral evaluations concerning the acceptable levels of personal risk workers assume are forced into the arena of explicit debate. At an even larger scale, failures in presumably competent political institutions to effectively enact these basic public health measures undermine the cognitive stability of their legitimacy, and in so doing, open the door for previously "unthinkable" revisions to their structure to enter mainstream discourse.

Macro-level social change originates from within social systems as well. As has been foreshadowed by the preceding sections, anywhere that masses of individuals are exposed to persistent misalignments between their own lived experiences and their socially shaped Type 1 processing, there is the potential for widespread experiences of rupture and subsequent destabilizations of established social orders. The sources of this misalignment may be nonsocial, as is arguably the case in Marxists' proposals of "class consciousness" spontaneously arising among workers as they face common material conditions that contradict the precepts of the Capitalist social orders they inhabit (Marx 1977). As discussed, other collective misalignments may arise intrapersonally, such as when heteronormative cultures systematically exclude LGBTQ+ individuals' lived experiences from their automatic sensemaking frame-

works. Standing interfaces—geographic or otherwise—between divergent social realities may also generate collective experiences of rupture. Recontextualizing this type of interpersonal rupture into a more macrosocial context, we can consider how the involvement of institutional and other structural factors (e.g., a justice system that consistently extends greater protections to rich white individuals than poor non-white ones) may further exacerbate these experienced misalignments to especially volatile degrees.

As millennia of oppression and erasure of nondominant groups attests to, the mere existence of a large population of individuals experiencing similar types of cognitive misalignment with prevailing social orders is not, in and of itself, *sufficient* to precipitate macrosocial change. The existence of these individuals may nonetheless prove *necessary* to the endogenous generation of specific types of macrosocial change. When common conditions of misalignment exist for entire subpopulations, there is an increased likelihood that affected individuals will come to recognize that others are experiencing similar failures in their socially inherited realities. The chances of coming to this conscious realization may be increased by the availability of spaces that support this deliberative exploration of ruptured social backgrounds (e.g., forums devoted to "consciousness raising" are available). As members of these subpopulations develop ties to each other, they increase their ability to support one another in transitioning implicit elements of cognitively problematic, social orders (i.e., "doxa" (Bourdieu 1972)) into conscious awareness. Over time, this collective process may yield increasingly refined, explicit critiques of previously taken-for-granted dominant orders and the articulation of possible alternatives thereto (i.e., the formation of a "heterodoxy" (Bourdieu 1972)). On-going interactions may also allow members to begin mutually reinforcing one another in new sets of practices and interpretations that may in turn, lead to a "pre-figuring" (Boggs 1977; Smucker 2017) of alternative, taken-for-granted social orders. As the collective capacity and visibility of such groups grow, the strategic actions of its members within established institutional arenas, as well as members' increasingly ubiquitous nonconforming presence, can lead these groups into becoming macrolevel drivers of social change in their own right (e.g., a social movement).

Whether the pressures of macrosocial change arise from exogeneous or endogenous sources- or a combination thereof- they are unlikely to be met with widespread enthusiasm. Even for individuals who are dissatisfied with an existing social order, macrosocial change innately entails a significantly diminished level of cognitive ease in the navigation of social life. To the contrary, it is certain to be accompanied instead by masses of individuals experiencing increases in the cognitive demands of daily life and feeling the aversive affective responses related thereto. In this we find an at least partial, socio-cognitive account for classical notions of *anomie* (Durkheim 1951). With the *en masse* disintegration of once reliable social regularities, we also expect to see aggregate decreases in the predictability of individuals' behaviors (i.e., an emergence of "normlessness") as previously routinized actions and responses are abandoned. This self-reinforcing deterioration is likely to be accompanied by aggregate increases in negative sentiment and declines in reported well-being—which may be further complemented by more grave indicators of poor mental health such as increased addiction and suicide rates (Durkheim 1951).

Social disorder can only prevail for so long, however. As previously elaborated, the dictates of cognitive least effort and the inherent drive to return to more cognitively easeful states will, in aggregate, act as a collective ballast that seeks to draw society out of "unsettled times" (Sewell 2005; Swidler 2001) and back into more predictable, settled arrangements. Nothing in this drive toward renormalization entails that newly established social orders will be any "better" than previous ones. In point of fact, these collective cognitive pressures toward renormalization may well provide rich ground for demagogues and authoritarians who are willing to offer a swift return to a cognitively easeful state of normalcy by any means necessary—including the suppression and elimination of social groups deemed "disruptive" to a social order.

The exact shape a disrupted social system will ultimately restabilize into is usually a highly contingent, unpredictable, and path dependent (Arthur 1994) matter, one that is unpredictably sensitive to the actions of individuals (Ermakoff 2015; Sewell 2005; Shaw 2015). It is possible that the more sinister potentials of social restabilization may be counteracted—conceivably—through a collective capacity to resist this reflexive drive toward renormalization and a shared willingness to bear with the burdens of socio-cognitive uncertainty long enough to ensure that the foundations of the ensuing social order are better aligned with the conceived of greater good. Populations who have not had much experience dealing with the cognitive strains of social rupture, or who have not previously experienced the costs of being fundamentally misaligned with prevailing social orders, may face greater barriers in their ability to tolerate these intense degrees of sustained social uncertainty. In contrast, those who by choice or by necessity have previously cultivated the psychological capacities required to bear with rupture experiences may prove vital in helping prevent premature restabilizations of disrupted macrosocial orders into detrimental or regressive reconfigurations. If these individuals also possess the motivation and skill required to steer the chaos of collective rupture toward restabilization into more just social orders, specifically through recognizing and taking responsibility for the role their own choices and actions will play in cognitively structuring the newly rebuilt "normal" that will follow, beneficial macrosocial change may yet prove possible.

IMPLICATIONS FOR THE EMPIRICAL STUDY OF SOCIAL CHANGE

Establishing the cognitive bases of social rupture provides new vistas from which to reconceptualize social change processes. It also opens new empirical avenues for studying how these processes unfold via the implicit sensemaking of individuals. The following section offers a brief overview of a few methodologies for assessing the cognitive processes at the core of this model and outlines a general framework for how they might be used to study real-world social change processes. The viability of these and related empirical approaches must ultimately be proven out in practice. Nonetheless, the promise they hold for bringing deep social change processes into the arena of tangible measurement provide strong motivation for pursuing this work.

Measurement of the Conflict-Monitoring Response

Measuring transitions between Type 1 and 2 processing in individuals has been of interest to cognitive scientists for decades. Work within psychology and social psychology has also developed pathways for assessing the kinds of negative affective responses associated with the conflict-monitoring response that have been emphasized here. Although there are many potential measurement strategies to explore in these arenas, there are three particularly good candidates for transposition into the empirical study of social change—pupillometry/eye-tracking, indicators of anterior cingulate cortex (ACC) activation, and emotional response measures.

Pupillometry and eye-tracking: Pupillometry involves measuring changes in pupil width and has been used in medical contexts as well as psychological and behavioral economics research. The dilation of pupils in response to cognitive stimuli is well-established as a general indicator of surprise and increased expenditures of deliberative cognitive effort (Alamia et al. 2019; Kahneman and Beatty 1966; Sirois and Brisson 2014; van der Wel and van Steenbergen 2018). Changes in pupil width have historically been measured with handheld devices (pupillometers), but more recent iterations of eye-tracking software can also now be used. Use of this software comes with additional benefits in that tracking of spontaneous eye movements has also been used to assess allocation of cognitive resources as indicated by visual attention (Wermes et al. 2017; Zhao and Koch 2013), a functionality that may further help in identifying targets of increased conscious saliency in social settings.

Indicators of ACC Activation: As established, the anterior cingulate cortex (ACC) region of the brain has been implicated in a number of key cognitive and affective processes, including the transition from automatic to effortful cognitive processing related to conflict monitoring (Botvinick 2007; Botvinick et al. 2001; Braver et al. 2007; Devinsky et al. 1995; Shackman et al. 2011). While pupil dilation may act as a rough proxy for this activation (van Steenbergen and Band 2013), neuroscientific research has primarily relied on more direct measures. The less invasive (and less expensive) approach employs electroencephalograms (EEGs) to capture patterns of brainwave activity that signify ACC activation (Botvinick 2007; Bush et al. 2000; Stahl and Gibbons 2007). A more precise but costly tool for assessing ACC activation is brain imaging via fMRI (e.g., Ichikawa et al. 2011). Given that use of EEGs and fMRIs are not yet prevalent within sociology, studies employing these methods would almost certainly require cross-disciplinary collaboration. Continuing investment in the field of social neuroscience (Cacioppo 2002) may, however, increase the future attractiveness of these approaches.

Measurements of Emotional Response: The strong association of negative affective reactions with the triggering of conflict monitoring responses provides an additional pathway for measurement. Most familiar to sociologists are likely to be measures of emotional response that rely on subjects' self-report of their emotional state, either verbally or using nonverbal pictorial assessments (Bradley and Lang 1994). Alternative approaches focus instead on autonomic nervous system (ANS) indicators of

emotional responses, including skin conductance, blood pressure, and/or heart rate variability (Mauss and Robinson 2009). This ANS-based approach may offer benefits in terms of assessing unconscious reactions and avoiding social desirability effects, but debate remains on how fine-grained a picture they can provide on their own. A final route that may be most familiar to social psychologists is to infer emotional states through behavioral observations such as changes in vocal characteristics (e.g., pitch) or the formal coding of facial display features (Mauss and Robinson 2009). While behavioral assessments require specialized training and should be sensitized to cultural variations in emotional expression, they offer another, particularly rich angle for measuring the negative affective responses associated with conflict monitoring.

Empirical Studies of Social Change

There are many ways these and other related measures might be mobilized to study social change processes related to real-world contexts. The theoretical perspective developed herein can be used to develop a general, three step framework for how to approach the design of such studies.

Step 1: Cuing of Established Social Context

The first step involves cuing participants' established mental representations of real-world social change contexts. The key requirement of this step is to get participants to rely on their preexisting, Type 1 resources to interpret and navigate the social situation(s) with which they are presented. Inducing this implicit processing of familiar contexts while individuals are situated within a relatively unusual setting (i.e., a university lab) requires special care, but it is feasibly something that might be accomplished using immersive stimuli (e.g., vignettes, games, pictures, videos) that strongly evoke the social context of interest. For example, a researcher studying diversification of white-collar workplaces might use a video of people interacting in a standard office setting to cue implicit "workplace" representations in participants who have prior experience with those contexts.

Step 2: Introduction of Posited Source of Social Rupture

After a context has been cued, posited sources of social rupture that relate to real-world change processes can be introduced as an experimental treatment. This potential source of rupture may involve a predictable element of the established social order behaving unexpectedly, the cuing of competing representations of the social situation, and/or the introduction of an unexpected or novel element into it. In any case, the primary focus will be on assessing whether the introduced source of rupture leads to the expected triggering of participants' conflict monitoring response. Building on the previously established example, a social researcher might specifically be interested in the cognitive processing conflicts that are posited to arise from misalignments between diversified workplaces and culturally inherited, implicit associations linking race and gender characteristics with differing levels of social authority. This posited

source of rupture might be operationalized with a treatment that introduces into a context-cuing video of an office setting a scene that depicts a well-dressed black woman giving orders to a well-dressed white man (i.e., misalignment with the dominant implicit social order). Reactions to this intervention should be compared against a control condition involving an alternate scene of the same individuals interacting in reversed positions of authority (i.e., alignment with the dominant social order).

Step 3: Response Assessment

After cuing an established social context and introducing a posited source of social rupture, participants' can be assessed for signs that a conflict-monitoring response has been cued. As evinced by the incomplete list of measures overviewed here, social researchers have a variety of options in this regard. These choices will undoubtedly be driven in part by practical requirements related to study feasibility, costs, and the availability of cross-disciplinary collaborators. Ideally though, these measurement choices will also reflect researchers' priorities. Per the presented example, if a researcher is most interested in establishing "hard" evidence of continued differences in how the brain processes the exertion of workplace authority by different groups, EEG or fMRI measurement routes will be most appropriate. Alternatively, if a researcher's priority is instead establishing that women continue to be subject to increased scrutiny in certain workplace roles or that micro-aggressions toward nonwhite individuals continue be pervasive in such environments, other measures related to shifts in conscious saliency or negative affective response will be more appropriate. Ultimately, it is not only the general subject of social change, but the specifics of how these collective processes manifest in individual experiences and interpersonal consequences that must guide these and related study design decisions.

CONCLUSION

This work has aimed to provide social researchers with a new, cognitively grounded model of social rupture that empowers our understanding of social change processes. It has taken as its foundation well established cognition research on individuals' reflexive shifting from Type 1 to Type 2 processing of their environments and identified how this core mechanism is driven by the diminished reliability of individuals' implicitly generated inferences about their environment. It also presented key cognitive and affective effects associated with this conflict monitoring response and identified the inherent pressures that drive individuals back toward an implicit processing of their environments. From this basis, this work then showed how this basic cognitive mechanism, when placed in the context of mutually constituted social environments, accounts for many features of the classic sociological conception of social rupture.

This work then mobilized this foundational model toward establishing the cognitive bases of social change processes. It identified primary sources of social rupture across societal scales, from the intra-personal, to the interpersonal, to the macrosocial, and directly connected these individual-level experiences of rupture to the collective dynamics of social change. In the course of doing so, it foregrounded

implications concerning systemic inequalities in the populations that are expected to bear the brunt of social change and asserted the vital role of socio-cognitive diversity in ensuring a society's ability to adapt—most specifically toward more just and equitable configurations. It then concluded with a brief consideration of the new directions that this model provides for the empirical study of social change.

Ultimately, the most important benefits of a theoretical work such as this one cannot be realized in the immediacy, in its capacity as a standalone statement. Instead, these benefits must be proven out over the longer term, per the richness of insight it provides other researchers and in its ability to empower beneficial action within both research and real-world social contexts. The presentation of this general framework of social rupture and the cognitive bases of social change has sought to nurture these potentials, while remaining humbly cognizant of the fact that their realization can only be accomplished as part of a larger collective endeavor.

There are currently strong motivations for pursuing this type of shared undertaking. Undoubtedly, we find ourselves in an era of global social rupture. This state of mass uncertainty has been spurred on by innumerable factors, including increasingly consequential collisions between incompatible social realities, planetary-wide degradation of natural environments that have been stable for millennia, and at the time of this writing, the continuing fallout of a global pandemic across previously reliable interactional and institutional landscapes. As partially anticipated by the perspective developed herein, these mass societal destabilizations have been accompanied by resurgences of authoritarianism, escalating intolerance and violence toward vulnerable populations, massive declines in mental health, and paralyzing degrees of factionalization within our political systems. The present model offers new insight into some of the cognitive drivers that may underlie these collective trends and has proposed potential factors that may either exacerbate or mediate them. An enormous amount remains to be done, however, before such conceptual understanding can be translated into effective intervention. Regardless of whether this current work is taken up in this context or in alternative venues, our current circumstances have made clear that the subject of social change has become too vital a topic to remain consigned to the realm of mere academic debate. We must instead, urgently pursue more exact and useful understandings of these mechanisms by which we constitute, reinforce, and alter the social realities we inhabit and see that these understandings are mobilized into intentional, effective collective action. If we can accomplish this admittedly Herculean task, we may yet have a chance of interceding upon these fundamental forces of social change for the greater benefit of all.

REFERENCES

Alamia, Andrea, Rufin VanRullen, Emanuele Pasqualotto, André Mouraux, and Alexandre Zenon. 2019. "Pupil-Linked Arousal Responds to Unconscious Surprisal." *Journal of Neuroscience* 39: 27: 5369–5376.

Alexander, William H. and Joshua W. Brown. 2011. "Medial Prefrontal Cortex as an Action-Outcome Predictor." *Nature Neuroscience* 14: 10: 1338–1344.

Allport, Gordon. 1954. *The Nature of Prejudice*. Cambridge MA: Addison-Wesley Pub. Co.

Arthur, Brian. 1994. *Increasing Returns and Path Dependence in the Economy*. Ann Arbor: University of Michigan Press.

Benford, Robert D. and David A. Snow. 2000. "Framing Processes and Social Movements: An Overview and Assessment." *Annual Review of Sociology* 26: 611–639.
Berger, Peter and Thomas Luckmann. 1966. *The Social Construction of Reality: A Treatise in the Sociology of Knowledge*. Garden City, NY: Anchor Books.
Blumer, Herbert. 1969. *Symbolic Interactionism; Perspective and Method*. Englewood Cliffs, NJ: Prentice-Hall.
Boggs, Carl. 1977. "Marxism, Prefigurative Communism, and the Problem of Workers' Control." *Radical America* 11: 6: 99–122.
Botvinick, Matthew M. 2007. "Conflict Monitoring and Decision Making: Reconciling Two Perspectives on Anterior Cingulate Function." *Cognitive, Affective and Behavioral Neuroscience* 7: 4: 356–366.
Botvinick, Matthew M., Cameron S. Carter, Todd S. Braver, Deanna M. Barch, and Jonathan D. Cohen. 2001. "Conflict Monitoring and Cognitive Control." *Psychological Review* 108: 3: 624–652.
Botvinick, Matthew M., Jonathan D. Cohen, and Cameron S. Carter. 2004. "Conflict Monitoring and Anterior Cingulate Cortex: An Update." *Trends in Cognitive Sciences* 8: 12: 539–546.
Botvinick, Matthew, Leigh E. Nystrom, Kate Fissell, Cameron S. Carter, and Jonathan D. Cohen. 1999. "Conflict Monitoring versus Selection For-Action in Anterior Cingulate Cortex." *Nature* 402: 6758: 179–181.
Bourdieu, Pierre. 1972. *Outline of a Theory of Practice*. Cambridge: Cambridge University Press.
Bourdieu, Pierre. 1984. *Distinction: A Social Critique of the Judgement of Taste*. Cambridge, MA: Harvard University Press.
Boutyline, Andrei and Soter, Laura K. 2021. "Cultural Schemas: What They Are, How to Find Them, and What to Do Once You've Caught One." *American Sociological Review* 86: 4: 728–758. http://doi.org/10.1177/00031224211024525
Boutyline, Andrei and Stephen Vaisey. 2017. "Belief Network Analysis: A Relational Approach to Understanding the Structure of Attitudes." *American Journal of Sociology* 122: 5: 1371–1447.
Bradley, Margaret M. and Peter J. Lang. 1994. "Measuring Emotion: The Self-Assessment Manikin and the Semantic Differential." *Journal of Behavior Therapy and Experimental Psychiatry* 25: 1: 49–59
Braver, Todd S., Deanna M. Barch, Jeremy R. Gray, David L. Molfese, and Avraham Snyder. 2001. "Anterior Cingulate Cortex and Response Conflict: Effects of Frequency, Inhibition and Errors." *Cerebral Cortex* 11: 9: 825–836.
Braver, Todd S., Deanna M. Barch, Jeremy R. Gray, David L. Molfese, Avraham Snyder, and Matthew M. Botvinick. 2007. "Anterior Cingulate Cortex and Response Conflict: Effects of Frequency, Inhibition and Errors." *Cognitive, Affective and Behavioral Neuroscience* 7: 4: 356–366.
Bush, George, Phan Luu, and Michael I. Posner. 2000. "Cognitive and Emotional Influences in Anterior Cingulate Cortex." *Trends in Cognitive Sciences* 4: 6: 215–222.
Cacioppo, John T. 2002. *Foundations in Social Neuroscience*. Cambridge, MA: MIT Press.
Camic, Charles. 1986. "The Matter of Habit." *American Journal of Sociology* 91: 5: 1039–1087.
Carter, Cameron S., Todd S. Braver, Deanna M. Barch, Matthew M. Botvinick, Douglas Noll, and Jonathan D. Cohen. 1998. "Anterior Cingulate Cortex, Error Detection, and the Online Monitoring of Performance." *Science* 280: 5364: 747–749.
Cerulo, Karen A. 2010. "Mining the Intersections of Cognitive Sociology and Neuroscience." *Poetics* 38: 2: 115–132.
Cerulo, Karen A. 2015. "The Embodied Mind: Building on Wacquant's Carnal Sociology." *Qualitative Sociology* 38: 1: 33–38.
Cerulo, Karen A. 2018. "Scents and Sensibility: Olfaction, Sense-Making, and Meaning Attribution." *American Sociological Review* 83: 2: 361–389.
Devinsky, Orrin, Martha J. Morrell, and Brent A. Vogt. 1995. "Review Article: Contributions of Anterior Cingulate Cortex to Behaviour." *Brain* 118: 1: 279–306.
Douglas, Mary. 1986. *How Institutions Think*. Syracuse, New York: Syracuse University Press.
Dreisbach, Gesine and Rico Fischer. 2012. "Conflicts as Aversive Signals." *Brain and Cognition* 78: 2: 94–98.
Du Bois, William Edward Burghardt. 1903. *The Souls of Black Folk*. Orinda, CA: SeaWolf Press.
Durkheim, Émile. 1933. *The Division of Labor in Society*. New York: Free Press.
Durkheim, Émile. 1951. *Suicide: A Study in Sociology*. New York: The Free Press.
Egner, Tobias. 2011. "Surprise! A Unifying Model of Dorsal Anterior Cingulate Function?" *Nature Neuroscience* 14: 10: 1219–1220.
Ermakoff, Ivan. 2015. "The Structure of Contingency." *American Journal of Sociology* 121: 1: 64–125.
Evans, Jonathan St B. T. and Keith E. Stanovich. 2013. "Dual-Process Theories of Higher Cognition: Advancing the Debate." *Perspectives on Psychological Science* 8: 3: 223–241.
Fiske, Susan and Shelley Taylor. 1984. *Social Cognition*. Reading, Mass: Addison-Wesley Pub. Co.

Foster, Jacob G. 2018. "Culture and Computation: Steps to a Probably Approximately Correct Theory of Culture." *Poetics* 68(September 2017: 144–154.
Fritz, Julia and Gesine Dreisbach. 2013. "Conflicts as Aversive Signals: Conflict Priming Increases Negative Judgments for Neutral Stimuli." *Cognitive, Affective and Behavioral Neuroscience* 13: 2: 311–317.
Garfinkel, Harold. 1967. *Studies in Ethnomethodology*. Oxford: Polity Press.
Gingrich, Luann Good and Ernie Lightman. 2004. "Mediating Communities and Cultures: A Case Study of Informal Helpers in an Old Order Mennonite Community." *Families in Society* 85: 4: 511–520.
Goffman, Erving. 1959. *The Presentation of Self in Everyday Life*. New York: Random House.
Goffman, Erving. 1974. *Frame Analysis : An Essay on the Organization of Experience*. Cambridge, MA: Harvard University Press.
Goffman, Erving. 1983. "The Interaction Order." *American Review of Sociology* 48: 1: 1–17.
Greenwald, Anthony G., Debbie E. Mcghee, and Jordan L. K. Schwartz. 1998. "Measuring Individual Differences in Implicit Cognition : The Implicit Association Test." *Journal of Personality and Social Psychology* 74: 6: 1464–1480.
Habermas, Jürgen. 1984. *The Theory of Communicative Action*. Boston: Beacon Press.
Hunzaker, M. B. Fallin. 2016. "Cultural Sentiments and Schema-Consistency Bias in Information Transmission." *American Sociological Review* 81: 6: 1223–1250.
Hunzaker, M. B. Fallin, and Lauren Valentino. 2019. "Mapping Cultural Schemas: From Theory to Method." *American Sociological Review* 84: 5: 950–981.
Ichikawa, Naho, Greg J. Siegle, Neil P. Jones, Kyoko Kamishima, Wesley K. Thompson, James J. Gross, and Hideki Ohira. 2011. "Feeling Bad about Screwing Up: Emotion Regulation and Action Monitoring in the Anterior Cingulate Cortex." *Cognitive, Affective and Behavioral Neuroscience* 11: 3: 354–371.
Jansen, Robert. 2017. *Revolutionizing Repertoire : The Rise of Populist Mobilization in Peru*. Chicago: University of Chicago Press.
Jepperson, Ronald and John W. Meyer. 2011. "Multiple Levels of Analysis and the Limitations of Methodological Individualisms." *Sociological Theory* 29: 1: 54–73.
Kahneman, Daniel. 2003. "A perspective on Judgment and Choice: Mapping Bounded Rationality." *American Psychologist* 58: 9: 697–720.
Kahneman, Daniel. 2011. *Thinking Fast and Slow*. New York: Farrar, Straus and Giroux.
Kahneman, Daniel and Jackson Beatty. 1966. "Pupil Diameter and Load on Memory." *Science* 154: 3756: 1583–1585.
Kendi, Ibram X. 2019. *How to Be an Antiracist*. New York: One World.
Leschziner, Vanina. 2015. *At the Chef's Table Culinary Creativity in Elite Restaurants*. Stanford, California: Stanford University Press.
Leschziner, Vanina. 2019. "Dual Process Models in Sociology," In Wayne Brekhus and Gabe Ignatow (eds.), *The Oxford Handbook of Cognitive Sociology*: pp. 169–191. New York: Oxford University Press.
Leschziner, Vanina and Adam Isaiah Green. 2013. "Thinking about Food and Sex: Deliberate Cognition in the Routine Practices of a Field." *Sociological Theory* 26: 4: 1–37.
Lieberman, Matthew D. 2007. "Social Cognitive Neuroscience: A Review of Core Processes." *Annual Review of Psychology* 58: 259–289.
Lizardo, Omar. 2007. "'Mirror Neurons', Collective Objects and the Problem of Transmission: Reconsidering Stephen Turner's Critique of Practice Theory." *Journal for the Theory of Social Behaviour* 37: 3: 319–350.
Lizardo, Omar. 2017. "Improving Cultural Analysis: Considering Personal Culture in Its Declarative and Nondeclarative Modes." *American Sociological Review* 82: 1: 88–115.
Lizardo, Omar, Robert Mowry, Brandon Sepulvado, Dustin S. Stoltz, Marshall A. Taylor, Justin Van Ness, and Michael Wood. 2016. "What Are Dual Process Models? Implications for Cultural Analysis in Sociology." *Sociological Theory* 34: 4: 287–310.
Marx, Karl. 1977. *Capital : A Critique of Political Economy*. New York: Vintage Books.
Mauss, Iris and Michael D. Robinson. 2009. "Measures of Emotion: A Review Iris." *Cognition and Emotion* 23: 2: 1–23.
Merton, Robert K. 1948. "The Self-Fulfilling Prophecy." *The Antioch Review* 8: 2: 193–210.
Miles, Andrew, Raphaël Charron-Chénier, and Cyrus Schleifer. 2019. "Measuring Automatic Cognition: Advancing Dual-Process Research in Sociology." *American Sociological Review* 84: 2: 308–333.
Molinsky, Andrew. 2007. "Cross-Cultural Code-Switching: The Psychological Challenges of Adapting Behavior in Foreign Cultural Interactions." *Academy of Management Review* 32: 2: 622–640.
Orellana, Marjorie Faulstich. 2009. *Translating Childhoods: Immigrant Youth, Language, and Culture*. New Brunswick, NJ: Rutgers University Press.
Page, Scott. 2007. *The Difference*. Princeton: Princeton University Press.
Payne, B. Keith and C. Daryl Cameron 2013. "Implicit Social Cognition and Mental Representation," In E. D. Carlston (ed.), *The Oxford Handbook of Social Cognition*: pp. 220–238. New York: Oxford University Press.

Schutz, Alfred and Thomas Luckmann. 1973. *The Structures of the Life-World*. Evanston: Northwestern University Press.
Sewell, William 2005. *Logics of History*. Chicago: University of Chicago Press.
Shackman, Alexander J., Tim V. Salomons, Heleen A. Slagter, Andrew S. Fox, Jameel J. Winter, and Richard J. Davidson. 2011. "The Integration of Negative Affect, Pain and Cognitive Control in the Cingulate Cortex." *Nature Reviews Neuroscience* 12: 3: 154–167.
Shaw, Lynette. 2015. "Mechanics and Dynamics of Social Construction: Modeling the Emergence of Culture from Individual Mental Representation." *Poetics* 52: 75–90.
Shepherd, Hana. 2019. "Methods for Studying the Contextual Nature of Implicit Cognition," In Wayne Brekhus and Gabe Ignatow, (eds.), *Oxford Handbook of Cognitive Sociology*. New York: Oxford University Press.
Shepherd, Hana and Emily A. Marshall. 2018. "The Implicit Activation Mechanism of Culture: A Survey Experiment on Associations with Childbearing." *Poetics* 69: July: 1–14.
Sirois, Sylvain and Julie Brisson. 2014. "Pupillometry." *Wiley Interdisciplinary Reviews: Cognitive Science* 5: 6: 679–692.
Smucker, Jonathan Matthew. 2017. *Hegemony How-To: A Roadmap for Radicals*. Chico: AK Press.
Stahl, Jutta and Henning Gibbons. 2007. "Dynamics of Response-Conflict Monitoring and Individual Differences in Response Control and Behavioral Control: An Electrophysiological Investigation Using a Stop-Signal Task." *Clinical Neurophysiology* 118: 3: 581–596.
Stovel, Katherine, Benjamin Golub, and Eva M. Meyersson Milgrom. 2011. "Stabilizing Brokerage." *Proceedings of the National Academy of Sciences of the United States of America* 108: (SUPPL. 4): 21326–21332.
Stovel, Katherine and Lynette Shaw. 2012. "Brokerage." *Annual Review of Sociology* 38: 1: 139–158.
Strand, Michael and Omar Lizardo. 2017. "The Hysteresis Effect: Theorizing Mismatch in Action." *Journal for the Theory of Social Behaviour* 47: 2: 164–194.
Swidler, Ann. 2001. *Talk of Love: How Culture Matters*. Chicago: University of Chicago Press.
Tavory, Iddo and Gary Alan Fine. 2020. "Disruption and the Theory of the Interaction Order." *Theory and Society* 49: 3: 365–385.
Vaisey, Stephen. 2009. "Motivation and Justification: A Dual-Process Model of Culture in Action." *AJS; American Journal of Sociology* 114: 6: 1675–1715.
van der Wel, Pauline and Henk van Steenbergen. 2018. "Pupil Dilation as an Index of Effort in Cognitive Control Tasks: A Review." *Psychonomic Bulletin and Review* 25: 6: 2005–2015.
van Steenbergen, Henk and Guido P. H. Band. 2013. "Pupil Dilation in the Simon Task as a Marker of Conflict Processing." *Frontiers in Human Neuroscience* 7(March: 2014).
Vassena, Eliana, James Deraeve, and William H. Alexander. 2020. "Surprise, Value and Control in Anterior Cingulate Cortex during Speeded Decision-Making." *Nature Human Behaviour* 4: 4: 412–422.
Vassena, Eliana, Clay B. Holroyd, and William H. Alexander. 2017. "Computational Models of Anterior Cingulate Cortex: At the Crossroads between Prediction and Effort." *Frontiers in Neuroscience* 11: 1–9.
Wason, P.C., Jonathan St B. T Evans 1975. "Dual Processes in Reasoning?" *Cognition* 3: 141–154.
Wermes, Richard, Tania M. Lincoln, and Sylvia Helbig-Lang. 2017. "How Well Can We Measure Visual Attention? Psychometric Properties of Manual Response Times and First Fixation Latencies in a Visual Search Paradigm." *Cognitive Therapy and Research* 41: 4: 588–599.
West, Richard F. and Keith E. Stanovich. 2000. "Individual Differences in Reasoning: Implications for the Rationality Debate?" *Behavioral and Brain Sciences* 23: 645–726.
Wood, Michael Lee, Dustin S. Stoltz, Justin Van Ness, and Marshall A. Taylor. 2018. "Schemas and Frames." *Sociological Theory* 36: 3: 244–261.
Yeung, Nicholas. 2015. *Conflict Monitoring and Cognitive Control Oxford Handbooks Online Conflict Monitoring and Cognitive Control*. Vol. 2.
Yeung, Nick, Matthew M. Botvinick, and Jonathan D. Cohen. 2004. "The Neural Basis of Error Detection: Conflict Monitoring and the Error-Related Negativity." *Psychological Review* 111: 4: 931–959.
Zerubavel, Eviatar. 2015. *Hidden in Plain Sigh : The Social Structure of Irrelevance*. New York: Oxford University Press.
Zerubavel, Eviatar. 2018. *Taken for Granted: The Remarkable Power of the Unremarkable*. Princeton: Princeton University Press.
Zhao, Qi and Christof Koch. 2013. "Learning Saliency-Based Visual Attention: A Review." *Signal Processing* 93: 6: 1401–1407.