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Social Neuroscience and Public Policy on Intergroup Relations: A Hegelian Analysis

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Social neuroscience is an exciting new field with much to offer to the study of stigma and intergroup relations. In this article, we consider the potential impact that social neuroscience will have for social and public policy pertaining to these important topics. Taking a Hegelian approach, we discuss why social neuroscience should and should not be used by intergroup researchers and policy makers to inform public policy. We then critique these arguments and provide suggestions for best practices. Overall, our assessment of the potential for social neuroscience to inform public policy is positive, but we encourage researchers and policy makers alike to use this new methodology with social responsibility and frugality in mind.

Although early attempts to predict and control social transgressions looked to behavior for clues about how an individual might act, the last few decades have witnessed a shift of attention from an individual's outward activities to the activity inside his or her brain. Neuroscience has played a role in the American legal system since at least the early 1990s (Rosen, 2007), and if enthusiasm about "neurolaw" continues to grow, neuroscience will likely find its way into legal policy. Given the recent birth of social neuroscience, which infuses the field of social psychology with the theories and methods of cognitive neuroscience, it is

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also possible that neuroscience will one day find its way into public or social policy. Just as legal policy makers might use the brain to predict who will commit a murder, public policy makers might use the brain to predict who will commit a racist act. In this article, we discuss the implications of social neuroscience for public policy concerning stigma and social disadvantage. Taking a Hegelian approach, we evaluate both the advantages (thesis) and disadvantages (antithesis) of social neuroscience for public policy and then provide a synthesis describing best practices for policy makers as the field of social neuroscience moves forward.

The field of social neuroscience attempts to elucidate and understand the mechanisms underlying social behavior by combining biological and social approaches (Cacioppo & Berntson, 2002). This article does not attempt to review the field of stigma-related social neuroscience (for more thorough reviews see, e.g., Derks, Inzlicht, & Kang, 2008; Dovidio, Pearson, & Orr, 2008) but instead offers a critique of this field's applicability to the realm of policy. We begin with a presentation of our thesis, that social neuroscience can and should inform public policy.

Thesis: Neuroscience Should Inform Public Policy

One goal of the Society for the Psychological Study of Social Issues is to bring empirically sound research findings to bear on public policy. Neuroscience contributes to this goal by strengthening the empirical foundation upon which effective public policy is built. We will review three paths through which neuroscience strengthens social psychological research in general and research on intergroup relations in particular. First, neuroscience works to extend knowledge to another, biological, level of analysis. Second, neuroscience allows for the examination of implicit or automatic cognitive processes previously beyond the realm of measurement. Third, social neuroscience can influence policy by clarifying our notions of free will and determinism.

The unification of knowledge. The unification of knowledge across multiple levels of analysis, or *consilience*, is a fundamental goal of scientific inquiry (Wilson, 1998). Wilson points to William Whewell's first explanation of consilience: "consilience . . . takes place when an Induction, obtained from one class of facts, coincides with an Induction, obtained from another different class. This consilience is a test of the truth of the Theory in which it occurs" (Wilson, 1998, pp. 8–9). Neuroscience contributes to the consilience of psychological theories, and therefore the strength of the policies they inform, by increasing our understanding of the combination of physiological processes underlying psychological phenomena. In this context, neuroscience is but one piece of the overall enterprise of psychological science. When combined with standard cognitive and behavioral methodologies, neuroscience promises to reveal the biological underpinnings of

social behavior. Integrating findings from these different levels of analysis refines and constrains psychological theories (e.g., Cacioppo, 2004; Cacioppo, Berntson, & Nusbaum, 2008).

As an example, consider recent functional magnetic resonance imaging (fMRI) investigations of women experiencing stereotype threat (Krendl, Richeson, Kelley, & Heatherton, 2008; Wraga, Helt, Jacobs, & Sullivan, 2007). These women showed heightened activity in the rostral-ventral anterior cingulate cortex (ACC), a brain area associated with emotion regulation, and reduced activity in neural regions associated with high performance in math and spatial ability. Importantly, analyses linked this pattern of brain activation to impaired performance under stereotype threat, thus lending biological support to behavioral theories that coping with negative stereotype-related emotions uses up cognitive resources that could otherwise be applied to cognitive tasks (Schmader & Johns, 2003; Schmader, Johns, & Forbes, 2008). Whereas previous behavioral studies focused on only one mediator at a time, these neuroscience studies examined the diverse biological mechanisms that interactively produce the stereotype threat effect, showing that stereotype threat leads simultaneously to reductions in cognitive efficiency and increases in processing of negative affective reactions. From a policy-making standpoint, this suggests that interventions aimed at improving experiences for women in science and math must be multipronged. Interventions aimed simply at improving math skills, for example, are not enough. Instead, policy makers should move toward interventions that also teach women to effectively cope with stigma-related anxiety, for example, by teaching about stereotype threat (Johns, Schmader, & Martens, 2005). Indeed, as Johns and his colleagues note, knowing about stereotype threat is half the battle—which is as of yet absent from intervention-based policies related to gender issues in math and the sciences.

Beyond just this example, consilience is important for the process of policy making more broadly speaking. Policy making, implementation, and change are costly endeavors, and it is in everyone's best interest that policies are effective from their inception. Consilience is a helpful predictor of efficacy; if the results of many studies using many different methods point to the same finding, policies based on this finding are likely a better investment than policies based on findings without converging support. Given that policy makers are looking for research findings that will lead to policies that will give them the most bang for their policy buck, it is more likely that findings that have reached consilience (e.g., behavioral and neuroscience studies showing the same effects) will be implemented into policy. As such, from a scientist's perspective, striving for behavioral and neural consilience increases the chances that research findings will find their way into effective public policy.

Social neuroscience is particularly helpful because using a new method allows us to move beyond some of the method invariance issues that arise when the same behavioral measures (e.g., reaction time, self-report or peer report) are used again

and again. Of course, the same could be said if, for example, social neuroscience methods had been used for years before the advent of reaction time measurement. If that were the case, it would be important to complement social neuroscience work with reaction time work to more fully understand results independent from any method invariance inherent in social neuroscience measures. As such, consilience can only be achieved with multiple levels of analysis. Repeated demonstrations of a finding using the same method or at the same level of analyses are useful, but examining this finding with another method or another level of analysis—unifying our knowledge—is even better. Unifying behavioral and biological levels of analysis provides a detailed picture of the processes and mechanisms underlying social problems and the policies that will change them for the better. Going back to our example, now that the emotional coping-based theory of stereotype threat has achieved consilience, both scientists and the public can feel confident about dedicating resources toward interventions aimed at helping individuals cope more effectively with stereotype-related negative emotions.

Measuring implicit processes. In addition to increasing the consilience of social psychological theories, neuroscience allows for the direct and unobtrusive measurement of nonconscious and automatic processes that are impossible to assess with self-report and reaction time measures alone. This ability is of great import, as many cognitive operations occur automatically, outside of awareness and conscious control (Bargh, 1994). Further, some of the phenomena of interest to social psychologists, prejudiced attitudes for example, are susceptible to biased reporting, and adding a lower-level analysis provides a more accurate view of these phenomena than behavioral measures alone. Thus, neuroscience offers more direct measures of cognitive operations than the methods that are currently available.

For example, the event-related potential technique (ERP) allows us to measure implicit processes (e.g., racial and gender categorization, implicit evaluations, control processes) that occur very early in information processing (Correll, Urland, & Ito, 2006; Ito, Thompson, & Cacioppo, 2004; Ito & Urland, 2003, 2005; Kubota & Ito, 2007; Willadsen-Jensen & Ito, 2006). This research shows that racial categorization occurs within 200 milliseconds, and that this automatic racial categorization mediates the relationship between explicit cultural stereotypes and behavioral racial bias (Correll et al., 2006). Moreover, ERP measures show that, within 500 milliseconds, individuals exhibit more negative implicit evaluations of Black than White individuals (Ito et al., 2004). Importantly, the late positive potential, a specific ERP-component indicating implicit evaluation, has been related to modern racism scores (Ito et al., 2004), and is unaffected by instructions to misreport one's attitudes. ERP studies have also shed light on the automatic control processes that allow people to control their racial bias (Amodio, Devine, & Harmon-Jones, 2008; Amodio et al., 2004). While behavioral research had already revealed that people who are internally rather than externally motivated

to behave unprejudiced display less prejudice (Devine, Plant, Amodio, Harmon-Jones, & Vance, 2002), it was not until control processes were measured neurally that the cognitive mechanisms underlying control of racial bias were revealed. These ERP experiments show that people who are internally motivated to respond without prejudice are capable of automatically detecting situations that call for inhibition of stereotyping. As a result, these individuals are better able to inhibit prejudiced responses than individuals who are externally motivated to respond without bias.

As such, measures of brain activity provide a relatively more reliable view of separate cognitive operations (e.g., categorization, evaluation, cognitive control) that occur during person perception than is possible with traditional measures like the implicit association test (Greenwald, McGhee, & Schwarz, 1998). Although useful in their own right, behavioral measures tend to confound several mental operations (e.g., attention, categorization, response selection), whereas the ERP technique allows for a more direct, pinpointed measure of the operation of interest. This is not to say that ERPs give us absolute insight into true attitudes or perception, but just that they provide insight into the ways in which very early processing operations might affect behavior and the circumstances that influence these early processes.

As we have alluded to, neuroscience methodology holds the promise of measuring and disentangling separate implicit cognitive operations independent of controlled processes. In so doing, social neuroscience can help inform public policy by showing which processes are malleable and changeable and which are not, and thus help policy makers decide where resources should and should not be directed. For example, neuroscience research on racial categorization indicates that this categorization is automatic (Dickter & Bartholow, 2007; Ito et al., 2004; Ito & Urland, 2003, 2005), suggesting that public policy directed at reducing social categorization (e.g., color-blind policies and school uniforms in high schools) is unlikely to improve intergroup relations (Richeson et al., 2003; Richeson & Nussbaum, 2004; Schofield, 2001; Wolsko, Park, Judd, & Wittenbrink, 2000). On the other hand, neuroscience research has also indicated that responding to members of the outgroup can change depending on a person's processing goals and motivation to respond without prejudice (Amodio et al., 2008; Wheeler & Fiske, 2005), suggesting that public policy aimed at, for example, increasing egalitarian motives and teaching people what kind of situations call for control of racial biases has a good chance of succeeding (e.g., Amodio, 2008; Correll et al., 2007).

Clarifying free will. The final argument that we will offer for why neuroscience should inform public policy is a provocative one, and we present it here in hopes of sparking discussion and debate. Specifically, we argue that policy makers should pay attention to social neuroscience because by allowing us to actually witness the biological machinery underlying our actions, it has the power

to reawaken and perhaps transform our moral intuitions about free will and responsibility (Greene & Cohen, 2004). A cursory examination of our current legal and moral systems reveals an emphasis on blameworthiness and responsibility. In essence, a legal or moral transgression can only be officially deemed as such if two elements are present: a guilty act, or *actus rea*, and an accompanying guilty mind, or *mens rea.* The capacity to possess a guilty mind is regarded as something of a privilege; among others, children and mentally disabled individuals are generally judged as unable to take responsibility for their actions. Because their guilty actions cannot be accompanied by a sound guilty mind, these individuals are seldom punished in the legal system. Such notions of mind and free will have lead to a criminal-justice system directed by a delimited idea of retribution—namely, that criminals deserve to be punished only when they have freely chosen to commit an immoral act. However, recent neuroscience findings conflict with ideas of free will, suggesting that the activity in our own brains actually makes us less "free" than we would like to think. Instead, these findings suggest that the neural hardwiring of our brains—based largely upon the environments of our evolutionary predecessors—governs our actions in an uncontrollable, even deterministic, fashion (Greene, 2003; Greene, Nystrom, Engell, Darley, & Cohen, 2004; Greene, Sommerville, Nystrom, Darley, & Cohen, 2001). Basically, the argument here is that what we previously thought of as free will is really not so free; "free will" appears to be determined by processes that neuroscience methods are only now allowing us to see with our own eyes.

These ideas about free will are starting to have an impact upon the legal system in the United States. For example, in the 2005 Supreme Court case Roper versus Simmons, the court held that it is unconstitutional to impose capital punishment on an adolescent. During this case, neuroscientific evidence was presented to the court suggesting that adolescents should not be held responsible for their actions because of the developmental immaturity of brain regions associated with cognitive control and decision making. Thus, it was argued, adolescents cannot be held fully accountable for their actions, as the neural capacity to behave otherwise was not in place. The problem with this argument, of course, is that although all adolescents share this immature neuroanatomy, not all adolescents commit such crimes. What is at stake here is the broader issue of legal responsibility. Just as personal responsibility has been challenged by examinations of the social and structural factors that contribute to criminality, neuroscience has been similarly used to remove any sense of choice from the individual. If this argument is taken to its logical conclusion, any crime could be forgiven because of the lack of choice involved. As a consequence, our legal system must adopt new ideas about freedom, responsibility, and retribution if it is to effectively deal with contemporary challenges. In particular, less emphasis should be placed on the punishment of undesired behavior and more resources should be devoted toward initiatives designed to prevent future problems from occurring in the first place.

Given that neuroscience has begun to creep into the legal system, it will likely not be long before decisions about neural evidence are the subject of heated debate among legal policy makers and the lay public alike. New ideas about free will and responsibility garnered from neuroscience will also likely have an impact upon public policy makers. For example, will we allow a racist manager who turns down a Black employee for promotion hide behind the defense that his brain made him do it? Will we stop pushing for the patching of the leaky pipeline which keeps women out of top positions in math and science because the brains of their male colleagues will not allow them to accept women into their coterie? The answer to both of these questions is (hopefully) no. However, questions like these force us to reconsider our ostensibly outdated notions of free will and strike to the heart of the issue of what we evaluate as unequivocally right or wrong. Those with a vested interest in intergroup relations should pay careful attention to the ways in which neuroscience is reshaping ideas of free will and responsibility and, in combination with what we already know from social psychology, make suggestions for the most appropriate application of neuroscience to public policy. For example, although a move away from retribution-based policy (e.g., imprisoning someone who commits a hate crime) toward a consequentialist framework (e.g., teaching about multiculturalism and tolerance in schools) as suggested by Greene and Cohen (2004) may be an appropriate application, blindly pardoning those who transgress against intergroup harmony because their actions have been deemed to be out of their control is not. Neuroscience studies on racial bias not only reveal neurological processes that limit our notion of free will (e.g., the spontaneous activation of stereotypes, activation of emotion regulation in stereotype threat settings), but also indicate that our motivations impact the selection of behavioral responses (e.g., automatic control processes that limit racial bias among people who are internally motivated to respond without prejudice). Considering these new ideas from social neuroscience has the potential to shake up the field of intergroup research, to really encourage thought and debate about our stand on various issues and, hopefully, translate these shared beliefs into policy.

Antithesis: Neuroscience Should Not Inform Public Policy

In the previous section, we spent some time highlighting the ways in which neuroscience research can inform the public policy of intergroup relations. In this section, we take the reverse position, our antithesis, and contend that neuroscience has little to offer policy makers. In particular we argue that, at best, neuroscience cannot inform policy because the brain cannot describe the mind and has actually taught us very little that we did not already know and, at worst, should not inform policy because it presents persuasive arguments that could lead to misguided conclusions. Please note that our antithesis is not based on a criticism of methods

in neuroscience, which although considerable, have been discussed extensively by others (e.g., Miller, 2008).

The limits of reductionism. Despite claims to the contrary (e.g., Harmon-Jones & Winkielman, 2007), there can be no doubt that social neuroscience is at its core an exercise in reductionism. Reductionism is a framework whereby phenomena at one level are explained completely in terms of other, more fundamental phenomena. Any social neuroscience approach reduces psychological phenomena to basic neurobiological ones. In terms of stigma, we are in danger of losing rich information about the complex, lived experience of stigma at the macrolevel (e.g., Chaudoir & Quinn, this issue; Jahoda, Wilson, Stalker, & Cairney, this issue; van Laar, Derks, Ellemers, & Bleeker, this issue), and replacing this with a more mundane understanding of physiological effects at the microlevel. When we declare that coping with a stigmatized identity can lead to increases in levels of blood cortisol and blood pressure (e.g., Blascovich, Spencer, Quinn, & Steele, 2001), we reduce the lived experience of stress to physiology. When we show that the experience of stereotype threat is associated with activity in the brain's prefrontal cortex (Krendl et al., 2008; Wraga et al., 2007), we are reducing the psychological experience of fear and apprehension to neurology.

There is nothing wrong with reductionism per se; reductionist methods are the basis for many well developed fields of scientific inquiry, including physics, chemistry, and cell biology. As psychologists, we regularly use reductionist logic when we search for the basic cognitive mechanisms and processes that underlie our favorite phenomena. The field believes, for example, that stereotype threat is an interaction between emotional arousal and cognitive distraction (Johns, Inzlicht, & Schmader, 2008; Schmader et al., 2008) because of reductionist methods. The problems with reductionism arise when we consider large-scale fields such as psychology, sociology, or economics. Behavior can be described by a hierarchy of organization, and while describing it one level down the hierarchy is desirable (Dawkins, 1986), any attempt to reduce complex phenomenon down many levels of the hierarchy is to abandon psychology altogether (Dennett, 1969). The further down this hierarchy we go in search of basic elements, the further we are from our phenomena of interest, which, because of their complexity, may be governed by an entirely different set of emergent principles than are the basic elements. Although neuroscience may be useful to social psychology when studying a certain class of intra-individual phenomena (e.g., social cognition), it may be less useful when trying to reduce other, more complex social phenomena to the brain (Dovidio et al., 2008). For example, if one was interested in understanding how a nation can best integrate its immigrant populations, it would make little sense to analyze this in terms of an interaction between this and that brain area, just as it would make little sense to analyze it in terms of the physical and mathematical laws governing nerve cell conduction. A more useful approach would be to recognize the impact

of all factors, including those that are structural and situational, and these factors may not be decomposable into basic elements in the brain. The point here is that although reductionism helps us to understand phenomena at adjacent levels of the explanatory hierarchy, it becomes problematic when we go too far down.

Even if we could provide explanations for the mind from low-level analyses of the brain, we need to ask if these explanations are good, or if there are better ones available. Philosopher Hilary Putnam once stated that the laws of particle physics could not provide a good explanation of why a square peg would not fit into a round hole (Putnam, 1975). Although an invocation of quantum electrodynamics could provide some sort of deduction, it would provide a terrible explanation—and who needs terrible explanations when a simple and elegant explanation is readily available?—that the round hole is smaller than the cross-section of the square peg. Along similar lines, is the link between stereotype threat and the ACC (Derks et al., 2008) an explanation of stereotype threat or is it merely a description? And if it is an explanation, isn't an explanation based on stress and distraction better? When explaining psychological phenomena, especially higher-order ones, we may be better served by psychological explanations than neurological ones. Mind, after all, is not the same as brain. Perhaps because the connection between mind and brain is unclear, the actual utility of social neuroscience for policy makers is also unclear.

Reductionism-related problems for social neuroscience are true not only for understanding process, but also for our efforts to develop interventions. Intervention is a major goal of policy, but reductionism to brain processes is not intervention friendly, particularly policy related to intergroup issues. For example, we now know that the amygdala is implicated in stereotyping (e.g., Cunningham et al., 2004), but is intervening at the level of the amygdala really a viable solution for reducing prejudice? Intervening at this level would be expensive, invasive, and, frankly, seems a bit absurd (take this pill once a day and your prejudice will disappear!), not to mention nonspecific. For example, taking a drug or using electricity to stimulate or subdue the amygdala would be highly undesirable, given that the amygdala is involved in a host of other brain processes, many of which we are not even aware of at this point. Interventions for social problems seem better suited to the societal—or at the very least, individual—level, not the physiological level. When we think about it this way, learning more and more about the brain's role in stigma-related processes does not necessarily bring us any closer to designing interventions to improve the lives of stigmatized individuals. Again, we are confronted with the problems that arise when we attempt to go too far down the explanatory hierarchy.

Incremental utility. Whereas the preceding section was concerned with theoretical questions perhaps best left to philosophers, what follows is nothing if not practical. A number of researchers have argued that social neuroscience would

lead to groundbreaking discoveries that could make novel theoretical contributions to social psychology (e.g., Cacioppo & Berntson, 2002; Ochsner & Lieberman, 2001). Neuroscience, it was claimed, would also constrain psychological theorizing to what is physically and biologically possible (e.g., Cacioppo & Berntson, 2002; Ochsner, 2007). In our view, however, social neuroscience has fallen short of this enormous promise. A quick scan of the—admittedly, still very young—social neuroscience literature reveals very few instances of real progress or theoretical innovations. From the perspective of social psychology, neuroscience methods have actually added very little new information beyond what was already known from pure behavioral methods (Dovidio et al., 2008). Some have gone so far as to claim that neuroscientific findings have never constrained social-psychological theory (Kihlstrom, 2006).

Let us return to the neuroscientific study of prejudice and discrimination to illustrate this point. As mentioned above, neuroimaging has implicated the orbital gyrus and ACC in the experience of social identity threat (Wraga et al., 2007). Although these results are interesting and we have frequently cited these findings in our own work, we wonder how informative this is for social psychologists. After all, these findings did not actually expand our knowledge of stereotype threat; rather, they confirmed what the field had already uncovered with simple behavioral measures—that stereotype threat involves heightened arousal and executive control depletion (e.g., Ben-Zeev, Fein, & Inzlicht, 2005; Schmader & Johns, 2003). This type of research may be more relevant to neuroscientists interested in the ACC than to social psychologists. It seems, then, that social neuroscience—at least so far—has offered little in the way of incremental utility for social psychologist and, perhaps, policy makers. Far from constraining social psychological theory, it appears that social psychological theory has constrained our interpretations of neuroscience (Kihlstrom, 2006). In short, the relationship between social psychology and neuroscience may be asymmetrical, with social psychology offering a framework to understand and interpret brain data, but with the brain data offering little to social psychologist or policy makers in return.

The seductive brain. Whereas issues of ontological reductionism and incremental utility suggest that social neuroscience cannot inform public policy, a number of other factors—related mostly to the way neuroscience is perceived by lay audiences—suggest that it should not inform policy. Very few scientific endeavors have garnered as much public and media attention as studies that show the human brain "in action." Yet brain data—and especially brain images—have a power to persuade that reaches far beyond their power to explain.

A recent study suggests that people are more likely to believe a bad explanation for a phenomenon when it is accompanied by irrelevant neuroscientific explanation than without the brain data (Weisberg, Keil, Goodstein, Rawson, & Gray, 2008). Neuroscience explanations, that is, seem to mask otherwise salient

logical inconsistencies in an argument. And concrete brain images are even more seductive. In a recent paper by McCabe and Castel (2008), participants had to evaluate the scientific reasoning of, in one study, newspaper reports of a brain imaging study, and in a second study, a real journal article reporting brain data. Participants saw one of three versions of these articles: in one condition the brain data were described in the text, in a second there was the text plus a bar-graph summary of the brain data, and in a third there was the text plus an fMRI-style brain image summarizing the data. Results revealed that those who saw the brain image rated the scientific reasoning of both the newspaper and journal article as more compelling than did the others even though the images themselves added no new relevant information beyond the text. Clearly people are too easily convinced by brain data and brain images; readers may be left with the false impression that they are learning something more scientific because of the inclusion of images showing the physical brain "in action." It is thus important that researchers and audiences do not privilege neuroscience data and make sure to hold it to the same statistical and interpretational standards as behavioral data (Cacioppo et al., 2003; Dovidio et al., 2008).

This issue makes brain data dangerous—especially to policy makers. In the hands of people who have only limited knowledge of neuroscience, brain data could be used to advocate or defend this or that social policy despite only weak scientific evidence for it. For example, in 2007 the *New York Times* ran an op-ed piece that reported on an fMRI study that could "reveal some voter impressions on which [the 2008 US Presidential] election may well turn" (Iacobini et al., 2007). The study (and op-ed piece) was widely criticized by the neuroscientific community, which bristled at a design that relied so heavily on reverse inference and was described as little data and lots of storytelling (Miller, 2008). The lay public however, may not understand the scientific problems of the study and instead become mesmerized by the idea of a "bona fide pipeline" to voter intentions. Policy makers may be equally impressed and start advocating for positions that "voters' brains" really want. The bottom line is that there is a real danger that the public (including judges and juries, policy makers, employers, insurers, etc.) will ignore the complexities of neuroscience and treat brain images as a kind of indisputable truth. It is for this reason that the field of "neuroethics" was born, with a new Neuroethics Society, a new *Neuroethics* journal, and a number of neuroethics centers worldwide safeguarding against this possibility.

The brain is so seductive, in fact, that it may distract us from important research that does not employ neuroscientific methodology. If we continue to place so much emphasis on brain data, what becomes of psychological effects that have not yet or cannot ever be shown on a neural level? It is important to remember that the types of studies that are possible with current neuroscience methods are quite constrained and, as such, neuroscience must be viewed as an added tool, not a necessary step, in testing the validity of social psychological

research. For example, we do not yet have the technology or perhaps even the resources to truly examine what happens when many brains are put together in vivo, or even what happens when one brain is put into a real social context. These are important limitations to keep in mind as we continue to move forward with the social neuroscience approach.

Synthesis: Making the Best of the Inevitable

In this article, we have outlined some—but by no means all—of the reasons why neuroscience should and should not be used to inform public policy on intergroup relations. Despite the cons associated with social neuroscience, we believe that the field will continue to grow and eventually expand into the realm of public policy. Although these cons will continue to exist, the proper application of social neuroscience has the potential to lead to a myriad of successful policy decisions and programs aimed at increasing intergroup harmony. In this section, we offer a synthesis of our stances for and against the inclusion of neuroscience in the development of public policy on intergroup relations and make suggestions for possible best practices for the new area of neuropolicy.

Our reasons for the inclusion of neuroscience in public policy are united by themes of social responsibility and simple frugality. The resources, financial and otherwise, for increasing intergroup harmony and decreasing the negative effects of stigma are limited and scientists and policy makers have a responsibility to direct resources only toward those programs and initiatives with the greatest potential for positive impact. By increasing the consilience of social psychological theories, allowing for the measurement of implicit and automatic processes, and clarifying our ideas of free will, we believe that neuroscience will help scientists and policy makers to identify and develop programs with a high likelihood of success and low or no likelihood of resource waste.

In our opinion, one of the main reasons that neuroscience findings should be used to inform public policy is that neuroscience increases the consilience of theories upon which policy is based. Combining findings from social neuroscience with findings from investigations employing more traditional methods of analysis allows for a much more precise isolation of mechanisms and processes underlying effects of interest in the intergroup literature. In turn, this allows for the development of targeted interventions aimed at specific and potentially manageable symptoms (e.g., cognitive resource depletion due to stereotype threat) instead of at unwieldy problems (e.g., racism) too large to deal with effectively.

Contrary to this argument is the suggestion that neuroscience methodology has added little to the field of social psychology (Dovidio et al., 2008; Kihlstrom, 2006). Given the considerable expense of many neuroscience methods, particularly the fMRI technique, this point cannot be taken lightly. In light of concerns about neuroscience's substantial cost and questionable incremental validity, and

keeping with our themes of responsibility and frugality, we suggest that researchers refrain from seeking consilience through neuroscience for the sake of consilience alone. Neuroscience methods only really need to be employed in situations where research questions cannot be answered using more traditional behavioral methods. Indeed, as mentioned earlier, neuroscience is but one tool available for use in a social psychologist's toolbox; it is not meant to replace the tried-and-true tools that already reside there. To this end, we lend our support to the recommendation that researchers, legislators, and funding agencies must continue to maintain a balance of support between non-neuroscience and neuroscience research (Dovidio et al., 2008). To be fair, however, we should mention that neuroscience is still a relatively new field and it is perhaps too early to expect groundbreaking discoveries that overturn what is already known. Indeed, much research is still aimed at validating the methods of social neuroscience through comparison with behavioral studies, which make up the foundation of social psychological knowledge. It is very likely the case that much more basic ground work in social neuroscience will precede the examination of complex phenomena and the extension of this work to policy.

We cannot help but wonder if psychologists have become so quickly enamored of neuroscience because of the promise that it holds to elevate the field's reputation as a bona fide science. A quick look at any introductory psychology textbook will reveal an entire chapter devoted to convincing the reader that psychology is, indeed, a science. Similar treatments would be unnecessary in any introductory chemistry, physics, or biology textbook. Neuroscience—which has "science" right there in the name—offers psychologists an opportunity to dabble in the methods that usually characterize the domain of the more prestigious and respected (Kanekar, 1990) "hard sciences." Psychologists, just like anyone else, can become entranced by the seductive allure of neuroscience (Weisberg et al., 2008) and, indeed, there appears to be much pressure in the field to market oneself as a social neuroscientist. To counter this allure, psychologists must recognize the merits and advantages of our own field and remember that science is defined by the rigorous use of the scientific method, and not by the content of inquiry. To reiterate, neuroscience only needs to be applied to psychological problems for which no reasonable psychological answer can be found, and using neuroscientific methods is by no means the only mark of a good social psychologist.

Our second argument for the inclusion of neuroscience in public policy is that it allows for the measurement of low-level nonconscious and automatic processes beyond the reach of traditional social psychological methods. This ability is particularly useful in a field such as intergroup relations, where the subject of inquiry is often sensitive and prone to biased responding. Neuroscience methods also hold promise in measuring separate implicit cognitive operations independent of related controlled processes. In keeping with the goal of frugality, this will help to direct resources toward malleable processes instead of toward automatic processes which are unlikely to benefit from policy-level intervention.

Counter to this argument, of course, is the idea that reductionism is limited, and that reducing psychological phenomena to lower and lower levels of neurobiological processes eventually becomes meaningless. Higher order phenomena like culture, race, and intergroup relations are complex (e.g., Crabtree, Haslam, Postmes, & Haslam, this issue; Kaiser & Wilkins, this issue) and operate according to very different principles than the lower-level basic elements of which they are made. Indeed, these higher order phenomena are likely governed by unknown emergent properties that become lost with more and more parsing. To address this issue, we support neuroscientific inquiry at appropriate level of analysis—levels adjacent to the phenomena of interest. The method proposed by Dawkins (1986), hierarchical reductionism, maintains that phenomena are best explained by objects one level below them in a hierarchy. The decision to partake in a reductionist inquiry in general should be made on a case-by-case basis and, as we mentioned earlier when discussing the application of neuroscience specifically, only needs to be done when a higher level analysis cannot produce a suitable solution to a research question. Reduction for the sake of reduction is simply unnecessary at best and an irresponsible waste of resources at worst.

Finally, we argued that the field of intergroup relations should pay attention to social neuroscience because it has the potential to change current notions of free will and responsibility. These issues should lead to great debate in the field of intergroup relations, allowing us to update and perhaps refine and strengthen our current theories and policies. By thinking critically about the new and exciting ideas emerging from the field of social neuroscience, researchers and policy makers have the opportunity to clarify their own positions on issues related to intergroup relations.

In sum, we believe that social neuroscience will allow researchers to explore a new arena of inquiry in the field of intergroup relations. Whether or not this research goes on to influence public policy, we hope that this critique and suggestion of best practices will provide useful to scholars as they lay down first tracks in this exciting new frontier.

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