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Apathetic Racism Theory: a Neurosociological Study of How Moral Emotions Perpetuate Inequality

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APATHETIC RACISM THEORY: A NEUROSOCIOLOGICAL STUDY OF HOW MORAL EMOTIONS PERPETUATE INEQUALITY

by

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CERTIFICATE OF APPROVAL

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PH.D. THESIS

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This is to certify that the Ph.D. thesis of

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To my family

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ABSTRACT

While previous literature successfully demonstrates that racial prejudice is nourished and augmented by conventional societal notions of morality, it rarely explicates the social psychological mechanisms underlying this process. We know a relationship exists between racial prejudice and morality, but we do not fully understand how society's moral codes become operational within the human mind, and thus, how intractable they might be. My dissertation bridges this gap by developing 'apathetic racism theory', an interdisciplinary approach that combines neurological and sociological theories and methodologies, suggesting that moral apathy towards blacks constitutes the main mechanism for contemporary racism. The theory distinguishes between two forms of racism that rely on distinct neural processes: a) sympathetic gradationalism towards the middle class (for which the ventromedial prefrontal cortex is pivotal) and b) blended racism against the upper and lower classes (for which the amygdala and the insula are crucial). Using three experiments: 1) a pictorial vignette study, 2) a lesion study with patients with damage to the hypothesized brain regions, and 3) a functional Magnetic Resonance Imaging (fMRI) study, this dissertation provides partial support to my theory. By shedding light on some of the unexplored emotional mechanisms of race bias, this dissertation elucidates how seemingly positive evaluations of members of racial out-groups might actually sustain a racially inequitable status-quo.

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CHAPTER 1: INTRODUCTION

While overt forms of racial bias have been declining in the U.S., racial prejudice is still prevalent in covert ways (Pager and Shepherd 2008). For example, a majority of white Americans think that blacks have equal opportunities in employment and do not believe discrimination plays a role in unequal social outcomes (Pager 2007), despite evidence to the contrary (Avery and Rendall 2002; Pager and Quillian 2005; Western and Pettit 2005). However, a majority still hold racial stereotypes; for instance, they view blacks as lazy and violent, and view Hispanics as unintelligent and poor (Bobo and Kluegel 1997; Smith 1991). There is still intense public opposition to government policies to increase opportunities for blacks (Bobo and Kluegel 1997), and employers prefer a white applicant to a black one with the same qualifications (Bertrand and Mullainathan 2004; Pager, Western, and Bonikowski 2009; Pager, Western, and Sugie 2009).

This persistent inequality rejuvenated social scientists' interest in the role of discrimination, particularly subtle forms that are challenging to measure (Pager and Shepherd 2008). Researchers from the psychological sciences mainly focused on individual level mechanisms such as stereotypes, emotions and the automatic, non-conscious bias (Devine and Elliot 1995; Fiske et al. 2002; Greenwald and Banaji 1995), while social and political scientists concentrated on the structural and cultural factors shaping racism such as moral ideologies and socio-economic differences (Bobo et al. 1997; Feagin 1991; Lamont 1992, 2000; Sears and Henry 2002). The literature needs a comprehensive view that can explain how societal ideologies, moral codes and structural conditions become operational within the human mind (see Firat and McPherson 2010 for an example). Without such an understanding we cannot fully capture the nuanced, subtle mechanisms of contemporary racial bias.

My dissertation addresses this gap by developing an interdisciplinary theory: *apathetic racism*. Building on sociological literature suggesting that emotions are culturally constructed yet physiologically experienced processes (Thoits 1989), and psychological and neuroscientific literatures arguing that emotions are not only stronger predictors of racial discrimination (Opotow 1990; Leyens et al. 2003; Talaska et al. 2008) but also more important mechanisms for moral judgments and actions than cognitive beliefs (Damasio 1994; Greene 2007a, b; Haidt 2001), apathetic racism theory proposes that moral emotional apathy is the central mechanism underlying anti-black racism in the U.S. This suggests that an overall moral apathy, whereby white Americans feel less intense moral emotions towards blacks than whites, is the basic modern process underlying largely unconscious processes that perpetuate a system of often-unintentional racial distinction.

As explained in Chapter 2, while previous literature links racial prejudice to larger scale societal influences including morality, it has three major shortcomings: a) it does not specify how morality is enacted in individuals' perceptions and behavior, b) it simplifies the relationship between morality and prejudice by assuming an all-encompassing anti-black racial prejudice that targets 'all' blacks as a unified abstract collectivity and c) lacks empirical engagement with the role of emotions in racial prejudice. By bridging sociological notions of emotions as cultural constructs with psychological and neuroscientific arguments, apathetic racism theory offers an organized account of the relationship between emotions and morality by illuminating how racial bias fundamentally intersects with social class.

Accordingly, racial bias is modulated by social class membership, meaning that it takes different forms depending on the social class positions of the people being evaluated. The theory identifies two different forms of bias depending on class membership: a. *sympathetic gradationalism* –race bias directed towards middle class blacks (includes high approach/low avoidance moral emotions like pride and awe), and b.

blended racism –race bias in other class groups (manifested in a combination of high avoidance and low approach moral emotions like fear, envy or pity). While sympathetic gradationalism relies on non-conscious, covert mechanisms, blended racism is self-generated and conscious.

Moreover, neural mechanisms associated with these different types of racism are separable and become differentially triggered depending on perceptions of members of these groups. Thus, social interaction influences differential mental processing, often serving to maintain a racially inequitable social system even when people have racially egalitarian intentions. I identify the ventromedial prefrontal cortex (the VMPFC, brain region involved in empathy and moral emotions, Adolphs 2009; Damasio 1994; Greene and Haidt 2002) as key for sympathetic gradationalism and the amygdala and the insula (brain regions associated with threat detection and conscious emotions respectively, Buchel et al. 1998; LeDoux 2000; Schäfer et al. 2005) as key for blended racism.

I argue that the emotional and motivational basis for racism cannot be apprehended relying solely on traditional social scientific survey methodologies (see Pager and Shepherd for an overview of the mainstream methods). Emotions are biologically enabled, physiological processes. Therefore, in order to reveal the subtleties of emotional racial evaluations, apathetic racism theory integrates neurological and social scientific approaches. To test the theory explicated in detail in Chapter 3, this dissertation uses three experiments: 1) a pictorial vignette study, 2) a lesion study with patients with damage to the hypothesized brain regions, and 3) a functional Magnetic Resonance Imaging (fMRI) study.

In all experiments, Caucasian, adult participants were presented pictures of white and black people in three different socio-economic positions (low, middle, and high) to assess their emotional evaluations. In the behavioral (Chapter 5) and the neuropsychological (Chapter 6) parts of the study, participants reported their feelings of eight emotions (four moral: pride, disgust, envy and pity, and four basic: happiness,

anger, sadness and fear) on a computer. In the third experiment, presented in Chapter 7, subjects underwent fMRI scanning while viewing the same pictures (the picture ratings were also collected after the scanning, outside the scanner). While the vignette method is well suited to gather data on sensitive topics (Barter and Renold 1999) and gather data from a larger sample pool, the fMRI provides high spatial resolution images of the brain during experimental tasks. The lesion part of this study gave me more information about the functions of these brain regions by demonstrating how people would respond to the pictures if a certain brain region did not exist (Banich 2004).

This dissertation offers a theory that links emotions, morality and race bias in novel ways. The basic premise that guides this theory is that neurology and sociology can reciprocally inform each other for a better understanding of racial bias as experienced by individuals shaped within a wider cultural environment. Chapter 8 will evaluate the theory and the analyses, ultimately demonstrating the utility of interdisciplinary approaches for a better understanding of human social behavior.

CHAPTER 2: INDIVIDUAL-LEVEL THEORIES OF RACISM

Racism at the individual-level has long garnered attention from a multitude of disciplines. A search of publications that includes "racism" as a topic on the academic database Web of Knowledge[1] yields more than ten thousand results. Moreover, more than half of these articles (approximately 7,500) have been published since the year 2000. The recent upsurge in the interest in racism is partly due to the persistence in racial bias despite explicit racial egalitarianism. Various studies point out that racism is shifting into a subtler, more difficult to measure form; yet, scholars fail to develop novel theoretical and empirical strategies that can fully fathom contemporary racial bias. In my dissertation, I attempt to address this gap with a new approach integrating the wide array of theories discussed in this chapter with neurological methods and theories.

In this chapter, I present a summary and organizational outline of the major theoretical and research paradigms of individual-level racism. While this summary is not an exhaustive list of all theories of racism, it provides a categorical organization under which most theories can be grouped. At the end of the chapter, I present emergent themes and some unanswered questions from these theories. In pursuit of a more nuanced theory of individual-level racism, in the following chapter, I build on these emergent themes and attempt to address the unanswered questions.

I propose a typology that groups research on racial bias and attitudes under four categories depending on their premises regarding how racism operates: a) Individualistic Theories, b) Relational Theories, c) Socio-cultural Theories[2], and d) Social-structural Theories. While psychologists dominate the research under the first two categories, the majority of the studies in the last two categories are conducted by sociologists and

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[1] Conducted on June 26, 2013.

[2] For an elaboration of the differences between the 'socio-cultural' and 'social-structural' theories, also see Bobo et al. 1997.

political scientists. This disciplinary difference also shapes the empirical strategies employed by these different strands of research. For example, research following individualistic and relational theories is traditionally carried out by laboratory experiments, while socio-cultural and socio-structural theorists privilege survey methodologies (although of course a mixture of methodologies is evident in all categories). However, the key differences between these categories are formed not by their empirical strategies or units of analyses but by the distinctions in theoretical assumptions.

The relationship between these theories is illustrated by the following figure (Figure 2.1). This onion-like figure illustrates societal organization in which the innermost layer represents micro-level processes at the individual-level; as we move from inner to outer layers, the theoretical scope shifts from micro to macro–level processes. For example, while individualistic theories at the center of the onion focus on atomized attitudes, perception and emotion, relational theories concentrate on group relationships and dynamics such as inclusion/exclusion. Socio-cultural theories highlight cultural ideologies, practices and habits and social-structural theories emphasize the structural conditions such as economic conditions organizing social life.

A good way of clarifying the theoretical differences between these theories is to consider how each theory would hypothetically address the problem of racism. Individual-level theories would focus on intervention strategies at the individual-level (e.g. via stereotype reduction at the individual-level or de-individuation), relational theories would try to overcome group boundaries (e.g. increase inclusiveness), socio-cultural theories would attend to cultural ideologies and institutions as social-learning mechanisms (e.g. schooling and media), and social-structural theories would address structural issues (e.g. improvement of economic conditions for minorities, resolving segregation and institutional discrimination).

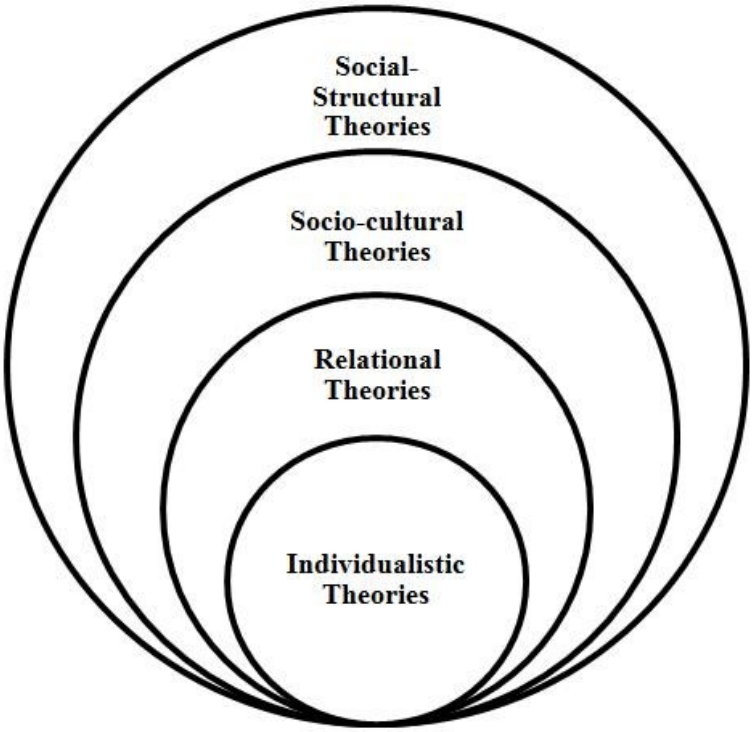

Figure 2.1 Conceptual relationship between theories of individual-level racism.

In this model, these approaches do not necessarily compete with each other, but rather they complement each other. However, while these theories might acknowledge the relevance of each other's theoretical positions, they don't take an integrative, holistic approach and fail to inform their research strategies with other perspectives. For example, individualistic theories recognize that stereotypes are constructed through historical processes and social dynamics, but rarely do they elaborate on any of these processes (e.g. how socio-economic conditions are related to different dimensions of stereotypes), let alone incorporate them as theoretical dimensions (see Table 2.1).

Table 2-1 Summary of the individual-level theories of racism

Theories	**General Assumptions**
Individualistic Theories:	**Stereotypes (rather than in-group identification) beget racism.**
Implicit Attitudes	Stereotypes are often activated through implicit (non-conscious) mechanisms. Implicit and explicit biases have separate mechanisms and can occur independently.
Aversive Racism	Negative stereotypes about racial/ethnic minority members lead to aversive feelings. Aversive racism is more likely to occur in ambivalent situations.
Stereotype Content Model	Stereotypes lead to emotional prejudice. Stereotypes have two dimensions: competence and warmth. Combination of these different dimensions lead to four distinct types of bias underlined by moral emotions: a) paternalistic prejudice (pity and sympathy), b) contemptuous prejudice (contempt and disgust), c) envious prejudice (envy and jealousy), and d) admiration (pride and admiration).
Relational Theories:	**Social identities and identification forms the basis of intergroup hostility and prejudice.**
Social Distance	Increased social distance between groups enhances bias and hostility. Social distancing can occur through emotional, cultural or interactional ways.
Social Identity Theory	Social categorization and depersonalization of one's self as well as others into groups accentuate in-group similarities and out-group differences and lead to prejudice.
Dehumanization and Infra-humanization	Inability to consider stigmatized groups as humans leads to dehumanization, an extreme form of social bias. Moral exclusion is an important form of infra-humanization in which out-groups are less likely to be attributed moral (or human) emotions.
Socio-cultural Theories:	**Racism is perpetuated and enforced through cultural socialization.**
The "New Racism" Theories	Cultural, moral ideologies (e.g., conservatism, Protestant ethic) cause contemporary racism. New racism is more subtle and disguised than previous forms.

Table 2-1 Continued

Boundary Research	Boundary making is a cultural process that relies on symbolic exclusion by privileging certain cultural practices/habits over others. Boundary making is a relational process in which construction of the in-group identity is related to the exclusion of the out-group. Moral boundaries are a form of boundary making that constitutes an important basis for contemporary racism.
Social-structural Theories:	**Privilege social-structural forces (such as economic relationships), social dominance and power.**
Prejudice as group position	Dominant racial groups construct and protect their group position by systemically oppressing racial minorities.
Color-blind racism	Contemporary racism relies on a color-blind ideology (that race no longer matters) to perpetuate racial hierarchies.
Class-based Race Inequality Approach	With the advance of industrialized social systems, social class is now a more important factor than race in determining life chances.
Intersectionality	Both race and class matters. Intersection of race and class (holding multiple positions) place people in unique positions in the social hierarchy.

Shared Emergent Themes	**Unanswered Questions**
Contemporary racism is subtle and relies on implicit (non-conscious) mechanisms. Emotional bias is more prevalent than cognitive bias. Moral ideologies (and thus moral emotions) shape racism.	What is the relationship between implicit attitudes and emotions? What is the role of class differences in racial bias?

Individualistic Theories

Individualistic theories focus on the role of the internalization of culturally formed beliefs, and especially stereotypes, in individual-level racism. Stereotypes are beliefs or generalizations about social categories learned early in life through socialization processes (Fiske 1998, 2002). Racial stereotypes bias behavior and decisions as a result of categorizing a person into a racial group regardless of other category memberships (Dovidio et al. 2010; Fiske 2002). In this paradigm, although constructed through similar societal processes, stereotypes can exist independent of each other (for example stereotypes of whites are not necessarily related to stereotypes of blacks). Therefore, in contrast to relational theories, little attention is paid to how stereotypes of different social groups are related to each other. Moreover, often little consideration is given to how beliefs and perception at the individual-level are tied to cultural or structural conditions.

In this view, prejudice is considered to have a dual nature consisting of: a) a negative affective component or antipathy directed against members of a social group and b) a cognitive component that relies on unfounded generalizations of all members of a target group (Allport 1954; Taylor and Pettigrew 2000; see also Quillian 2006). Until recently, studies of prejudice focused primarily on cognitive components, such as stereotyping or cognitive beliefs rather than affective dimensions (Fiske 1998). Moreover, these processes were traditionally measured with subjective self-reports (e.g., surveys). However, with the advent of new measurement strategies (like implicit measures of bias), the empirical and theoretical focus of individualistic theories shifted from explicit (conscious), cognitive attitudes and stereotypes to implicit (non-conscious), affective evaluations and emotions. Below, I summarize three major individualistic theories as contemporary approaches to racism.

Implicit Attitudes

Following Katz and Braly's (1933) footsteps, a large body of literature investigated racial stereotypes, particularly those of blacks, finding there has been substantial change in the content of the stereotypes (Devine and Elliot 1995; Dovidio and Gaertner 1986) over the 20th century. Contemporary stereotypes of blacks are more favorable than their predecessors (Madon et al. 2001). However, through new laboratory experimental techniques, psychologists have documented that stereotypes are not really fading out; they are rather changing form and becoming more subtle and implicit (Greenwald et al. 1998; Greenwald and Krieger 2006; Nosek et al. 2007; Schmidt and Nosek 2010). Traditionally, methodological investigation of stereotypes relied on subjective checklist reports or survey questions, but these newer strategies employ priming techniques attempting to tap into fast and automatic reactions. In these studies, when subjects are primed with race-related words or pictures, stereotypes associated with these racial groups are subconsciously activated to bias responses in stereotype-consistent ways (Dasgupta et al. 2000; Greenwald and Banaji 1995; Greenwald et al. 1998, 2003).

Implicit bias is often measured with reaction time, which compares the amount of time the participants spend to associate a racial category label (e.g. black or white) with a negatively or positively valenced word (e.g. pleasant or unpleasant). The majority of this research reports that Americans have an implicit preference for white Americans compared to African Americans (as interpreted through associating positive words with whites faster than with blacks) (Cunningham, Preacher, and Banaji 2001; Dasgupta et al. 2000; Nosek, Banaji, and Greenwald 2002). Similar studies have also indicated a 'weapon bias' where African Americans were more likely than white Americans to be falsely seen to carry weapons and mistakenly shot at when unarmed in computer generated experiments (Correll et al. 2002; Greenwald, Oakes and Hoffman 2002; Nosek et al. 2007; Payne 2001).

Confirming the prevalence of implicit, negative racial stereotypes and their consequences, this body of research has also revealed that explicit and implicit bias are not necessarily related, therefore an individual explicitly holding race-egalitarian beliefs and attitudes can show implicitly biased reactions (Amodio and Devine 2006; Devine 1989; Fazio et al. 1995; Greenwald et al. 1998). While a thorough consideration has not been given to the nature of the implicit attitudes (e.g. bodily, affective or cognitive mechanisms), it is commonly thought that implicit biases are linked to initial gut-feelings and emotion as they are sensitive to the affective valence of stimuli and might be shaped by affective experiences and emotional (re)conditioning (Govan and Williams 2004; Rudman 2004; Rudman, Ashmore, and Gary 2001). Therefore, recent research on racial stereotypes highlighted the importance of emotions and affect (Fiske et al. 2002; Talaska, Fiske, and Chaiken 2008).

Aversive Racism

With their theory of aversive racism, Gaertner and Dovidio (Gaertner and Dovidio 1986; Dovidio and Gaertner 2004, Dovidio, Kawakami, and Gaertner 2002) focus on emotional components to bring an explanation to the persistence of implicit bias against blacks. For example, in an early experiment where the participants were led to believe there is a person in the next room who needs emergency assistance, they showed biased behavior (more likely to help whites than blacks) only when there were other white bystanders present (more ambiguous situation because of the diffusion of responsibility) and did not discriminate when they were the "only witness" (Gaertner and Dovidio 1977). Similarly, studies of personnel selection show that when provided with a combination of both positive and negative information about black and white candidates, whites were likely to be favored over blacks; however, they are treated the same when presented with uniformly negative or positive information (Dovidio and Gaertner 1996, 2000).

Accordingly, despite their conscious racially egalitarian values, many people hold unconscious negative feelings about blacks. These negative feelings, especially in ambiguous situations, lead them to avoid interaction with blacks due to fear and discomfort. So, rather than an explicit and hostile racism, modern racism is more subtle and underlined by unconscious avoidance feelings. However, while theoretically prioritizing emotions, unfortunately this aversive racism framework fails to methodologically capture aversive feelings and emotions, focusing extensively on behavioral measures in documenting a cognitive/affective concept such as racism. Therefore, while producing empirically interesting results, these findings present a tautological view as the theory argues that racism, defined as feelings and attitudes, cause discrimination; yet, racism is only measured and documented in its effects as discriminating behavior.

Stereotype Content Model

Among the pioneers of emotional prejudice research, Fiske and her colleagues have developed the "Stereotype Content Model" (SCM, Fiske et al. 2002; Cuddy and Fiske 2002). In this theory, stereotypes are considered to have two dimensions, warmth and competence, on which social groups are categorized. These dimensions include the perceived status (e.g., economic success) and perceived competition with the in-group (e.g., resource conflict) such that higher status predicts greater competence and lower competition predicts greater warmth (Fiske et al. 2002). For example, groups that are low in both competition and status (e.g. elderly) are stereotyped as high in warmth and low in competence. So, unlike other theories in the individualistic paradigm, the stereotype content model incorporates social structural elements like status into the theory. However, its conceptualization of status is still simplistic and stripped from any social, institutional or historical background. By explaining the causes of social phenomena like racism through focusing on universal predispositions to structure and status hierarchies,

this theory stands in sharp contrast to socio-cultural and structural theories that highlight the role of historically located cultural processes and material conditions in the reproduction of social biases and inequality.

Accordingly, the two stereotype dimensions lead to four distinct types of social bias enacted by different moral emotions: a) paternalistic prejudice (for those low in competence, high in warmth, associated with pity and sympathy, e.g. disabled or elderly people), b) contemptuous prejudice (for those low in competence and warmth, associated with contempt and disgust, e.g. poor people, drug addicts), c) envious prejudice (for those high in competence, low in warmth, associated with envy and jealousy, e.g. Asians, feminists), and d) admiration (for those high in competence and warmth, associated with pride and admiration, e.g. middle class people) (Cuddy et al. 2009; Fiske and Cuddy 2006; Fiske et al. 2002; Lin et al. 2005).

An important implication of the SCM is that anti-black racism is not a uni-dimensional concept; prejudice does not uniformly target blacks. For example, Fiske et al. (2002) find that professional blacks are envied and perceived as high on competence, while poor blacks face contempt and considered low in both competence and warmth. Additionally, subjects did not distinguish between poor blacks and whites in their ratings (Fiske et al. 2002). While these authors highlight the effects of social class as they intersect with racial stereotypes, this explanation is not developed. Moreover, this research does not match racial groups across different status groups (e.g., while stereotypes of black professionals are collected, neither white professionals nor middle class blacks or whites are examined), so it is not possible to systematically determine the effects of social class. Furthermore, while the multi-dimensionality of anti-black racism is suggested, this theoretical caveat is not considered for other racial or ethnic categories by (e.g. Asians, Jews, e.g., Lin et al. 2005). Thus, although the mixed-content of the stereotypes and how they operate by facilitating various emotions are emphasized, how these stereotypes are (re)constructed, embodied and diffused in relation to the

historically, socially, politically and economically structured patterns of relationships are missing from this literature.

Relational Theories

Relational theories focus on how attitudes/feelings/perceptions of in-group members relate to those of out-group. The main premise of the theories in this group is that distinctions between the feelings towards in-group vs. out-group members underlie racial bias. While we perceive in-group members more positively and feel more empathy and sympathy, we socially and morally exclude out-group members, and even dehumanize them in extreme cases. Thus, racial bias is an exclusionary process that relies on group identities and identification.

Accordingly, relational theories differ from individualistic ones in two important ways. First, in individualistic theories, stereotypes are not necessarily related to each other (or at least these relationships are not considered); thus, in-group and out-group biases can exist independent of each other. In relational theories, on the other hand, construction of in-group identities is necessarily related to the perception of out-groups. For example, you can't exclude some groups without including others. The dehumanization of one group implies humanized others. Second, according to individualistic theories, stereotypes exist external to actors (in the social world) and are often internalized and enacted non-consciously. Relational theories, in contrast, emphasize an active and often conscious process of group glorification and the need for positive self-view and enhancement of the in-group. However, these approaches also share some common characteristics that stand in juxtaposition to socio-cultural and social-structural theories. For instance, both approaches are universalistic (trying to uncover universal mechanisms of social bias) and neglect historical, cultural and structural processes that shape individual-level attitudes and bias. Below, I explain two main strands of research with a relational approach.

Social Distance

Introduced by Emory Bogardus (1925, 1933), social distance is a concept that describes the social 'gap' between groups defining their affinities. While Bogardus mainly focused on affective social distance (sympathy and emotional empathy towards other group members), other dimensions such as normative (norms defining in-groups from out-groups, e.g., Simmel 1955), interactive (the frequency of interactions between group members, e.g., Warner and DeFleur 1969) and cultural (cultural practices and capital, e.g. Bourdieu 1990) social distance are also introduced to the literature (see Karakayali 2009 for an elaboration of the relation between these dimensions). The main premise of the social distance paradigm is that as the social distance between groups increases, relations between them also tend to worsen. Social distance is often measured by variations of the Bogardus social distance scale (Bogardus 1933), which asks people if they would accept a certain social group as close relatives, personal friends, neighbors, co-workers, citizen in the same country, only visitors in the country or exclude them entirely (note that the social distance gradually increases with each item)[3].

The social distance scale has been applied by various early studies to measure the distance between ethnic/racial groups in the U.S. (e.g., Triandis and Triandis 1960; see Owen et al. 1981); however, contemporary research on racism largely discarded this methodology. While psychologists have shifted their focus from social distance to racial

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[3] Contact Theory also focuses on the proximity or the contact between different social group members. However, instead of trying to explain the causes or mechanism of prejudice and racism, this theory concentrates on reducing prejudice. Based on Gordon Allport's (1954) seminal theory of prejudice, the contact hypothesis argues that increased intergroup contact diminishes prejudice if the groups are equal in status, have common goals, are not in competition and there is an authority sanction for the contact (Pettigrew 1997, Pettigrew and Tropp 2000). These assumptions are confirmed by a variety of studies that focused on various ethnic groups (e.g. Turks in Germany) as well as other stigmatized groups (such as mentally ill) (Caspi 1984, Pettigrew 1997, Wagner, Hewstone and Machleit 1989). So, while a theoretically distant literature, it is clear how this theory complements the Social Distance perspective, which presumes that greater social distance (in other words, the less contact) leads to greater intergroup prejudice, conflict and apathy.

prejudice, stereotypes and discrimination (see Stereotypes section), sociologists have transitioned to the study of dynamic, culturally constructed distancing (or boundary) processes (see Boundary Research section). Following the tradition of early urban ecologists (Burgess 1928; Park 1936), a stream in sociology, however, continued and popularized the social distance paradigm mainly through studying urban segregation. In this view, social distancing between racial/ethnic groups gave way to spatial distancing and outlined the contours of contemporary urban landscapes (Fosset 1996, 1998; Schelling 1978).

Social Identity Theory

Social Identity Theory is one of the most influential social psychology theories explicating the relationship between identity formation and prejudice (Tajfel 1978, 1982; Tajfel and Turner 1979, 1985, 1986; see Abrams and Hogg 2004). The basic premise is that people automatically categorize themselves and others into social groups (as in-groups and out-groups), and depersonalize the targets (seeing self or others as embodiments of a group rather than unique individuals). Through the social categorization process, targets (who could be self or other actors) are no longer represented as unique individuals but rather assimilated into prototypes (a fuzzy set of attributes that describe and prescribe groups). This assimilation into prototypes is called depersonalization. Depersonalization is an important process for the conception of the self and other group identities. Depersonalization is different than dehumanization (which implies seeing someone as less than human, explained further in the following section); it simply refers to seeing someone as not a unique person but as an embodiment of a group (Tajfel and Turner 1985; see Hogg 2006 for a review). Social categorization process accentuates intra-group differences and in-group similarities, resulting in behavior such as conformity, in-group altruism, cohesion etc. (Hogg and Terry 2000).

Self-enhancement is an important motivation for social identities. Self-enhancement and self-esteem motivation based on social groups thus leads to intragroup prejudice and discrimination. Accordingly, in Social Identity Theory, the stronger an in-group bias (motivated by self-esteem and enhancement), the stronger they will demonstrate out-group bias. Some empirical evidence also supports these notions reporting that individuals with stronger in-group racial preference show higher levels of bias towards other racial/ethnic groups (Lee 1991; Masson and Verkuyten 1993; Tzen and Jackson 1994). However, the self-enhancement principle is also criticized as it is not clear if self-enhancement is a cause or an effect of discrimination (Abrams and Hogg 1988). Moreover, the self-enhancement principle of the theory does not apply to East Asian cultures; Yuki (2003) finds that in-group identification and loyalty were not related to in-group self-esteem motivations, but rather connected to a sense of connectedness and collectivity in Japanese individuals. Social Identity Theory is also criticized for assuming all social identities are equal (Deaux et al. 1995), and failing to take into account the emotional and motivational components of identity processes underlying prejudice despite a growing body of evidence highlighting the importance of the automatic affect in prejudice (Brown 2000; Dashtipour 2009).

Dehumanization and Infra-humanization

Dehumanization is a recently popularized theoretical perspective that focuses on universal social cognitive and affective processes. Dehumanization is described as a cognitive bias that consists of the inability to mentalize (or empathize) with another human being by reducing them to a non-human being (Fiske 2009; see Haslam 2006 for a review). Often targeting extremely stigmatized out-group members, dehumanization is related to feelings of basic disgust in contrast to feelings of social and moral emotions (Fiske 2009; Harris and Fiske 2007). In general, dehumanization research takes a social neuroscience approach that reports reduced activation in the brain regions related to

empathy and moral emotions (e.g. medial prefrontal cortex) when dehumanization happens (Harris and Fiske 2006; 2007).

Infra-humanization (the notion that some groups are considered less human) theories carry dehumanization into the more specific domain of ethno-racial bias via moral exclusion (e.g. Opotow 1990; Leyens et al. 2003). In this view, secondary (moral) emotions such as love, hope, guilt and embarrassment are uniquely human emotions that are attributed to in-group members more often than out-group members (Leyens et al. 2000, 2003). Therefore, members of groups that are morally excluded (such as ethnic minorities) are dehumanized, and judged with primary emotions more often than secondary emotions (DeLuca-McLean and Castano 2009; Leyens et al. 2003).

For example, in studies conducted in the U.S and the U.K., Leidner et al. (2010) find that when participants read reports of mistreatment of prisoners and civilians by coalition troops in the Iraq war, those who showed greater in-group moral glorification (e.g. national pride) also indicated greater moral disengagement strategies like explicit dehumanization of Iraqis. While demonstrating an important mechanism for out-group bias, dehumanization and infra-humanization theories are not sufficient for explaining racial/ethnic bias. For one reason, some out-group bias occurs via attributing uniquely human moral emotions (e.g. contempt or envy, see Stereotype Content Model above) to out-group members.

Socio-cultural Theories

In contrast to the individualistic and relational theories that highlight the universal mechanisms of race bias, socio-cultural theories focus on how cultural systems of normativity and moral ideologies like the capitalist ethos of meritocracy shape racism. Accordingly, cultural evaluation systems and symbolic meaning making processes become the primary driving forces for social biases. Although theories in this paradigm sometimes touch on the interactions between cultural and structural resources, they are

still distinguished from social-structural theories of individual racism as the structural conditions have little explanatory power in racism in this account. Moreover, while this body of literature privileges conventional societal notions and how they are enacted in behavior or decisions, it rarely examines how feelings and emotions are involved in cultural manifestations, thus ignoring an important component of racial bias.

The "New Racism" Theories

Similar to Krysan (2000), I categorize a multitude of theoretical approaches under the rubric of "new racism" as they are very similar in their theoretical foundations and operationalization of racism[4]. I include Symbolic Racism (Kinder and Sears 1981; Sears and Henry 2002), Modern Racism (McConahay 1986, et al. 1981), Ambivalent Racism (Katz et al. 1986, Katz and Hass 1988), and Subtle Prejudice (Pettigrew and Meertens 1995, theoretical focus is racism in Western Europe). The common denominator of these theories is that racism is still prevalent in American society because racism has altered into a new, and more subtle, form rooted in an abstract system of moral political ideology (early-learned shared sets of social norms, values and ideals) centered on traditional American values embedded in the Protestant Ethic (Kinder and Sears 1981; Sears and Henry 2002, 2003, 2005; McConahay 1986; Katz et al. 1986; Katz and Hass 1988).

In this view, racism no longer depends on biological or other deterministic arguments that pose genetic superiority or inferiority of racial groups, but is more subtle and relies heavily on moral arguments that revolve around moral superiority or inferiority. This new form of racism is a coherent belief system embodying negative feelings that might be experienced as fear, avoidance, anger, disgust and contempt toward

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[4] Laissez-faire racism (Bobo et al. 1997) is conceptually very similar to the "new racism" theories and clustered under the same category by Krysan (2000). However, as I also explain in the following pages, there are some fundamental differences in some of their theoretical assumptions (as also emphasized by the authors in Bobo et al. 1997). Therefore, I focus on this theory in a separate section.

blacks as a group combined with a sense that blacks violate prized American values like work-ethic and honesty (Katz and Hass 1988; Kinder and Sears 1981; Sears 1988; Sears and Henry 2003, 2005; Sears, van Laar, Carrillo and Kosterman 1997). Therefore, the contemporary U.S. moral system sustains racial prejudice and legitimizes racial inequality by promoting beliefs such as "blacks are responsible for their own disadvantages because they are not willing to take responsibility for their lives," " racial discrimination is not an important barrier any more to blacks' prospects for a good life," and "blacks' anger about their own treatment, their demands for better equality and special attention given to them are not truly justified" (Kinder and Sears 1981; Sears 1988; Sears, van Laar, Carrillo and Kosterman 1997). An important note for this theoretical framework is that it simplifies the relationship between morality and prejudice by assuming an all-encompassing anti-black racial prejudice that targets 'all' blacks as a unified abstract collectivity (in contrast to intersectionality research described under social-structural theories).

Boundary Research

Boundary research in sociology is heavily influenced by Bourdieu's (e.g., Bourdieu 1990) work and considers culture as a repertoire from which symbolic meanings are drawn to define symbolic boundaries (Lamont, 1992, 2000; Lamont and Molnar 2002). Accordingly, symbolic boundaries are tools (by which individuals and groups struggle over and come to agree upon definitions of reality) used to make conceptual distinctions to categorize objects, people, practices, and even time and space (Lamont and Molnar 2002). They are different from but necessary for social boundaries, which Lamont and Molnar (2002) describe as objectified forms of social differences manifested in unequal access and unequal distribution of resources and social opportunities. The content of symbolic boundaries are shaped by cultural resources available to individuals –such as historical national and religious traditions, education

systems, media etc.- and the structural conditions they are placed in –such as market positions, social networks, level of criminality in the communities etc. (Lamont 1992; 2000). Through our involvement in a wide range of groups (such as recreational groups, ethnic groups, and professional groups), we constantly produce and re-establish competing boundaries (Lamont 1992).

Boundaries are fine mental lines that separate 'us' from 'them,' and are therefore an intrinsic part of the process of constituting the self (defining who we are) (Lamont 1992; Sayer 2005; Zerubavel 1991). By generating distinctions, we signal our identity and develop a sense of security, dignity and honor; and by avoiding shame, we maintain a positive self-identity (Lamont 1992). While, similar to the relational theories, especially Social Identity Theory, boundary research considers identity processes as relational, it diverges from relational theories with its emphasis on the contextual and cultural nature of these processes (rather than universal).

Boundaries also separate what is acceptable, appropriate and moral from what is unacceptable, inappropriate and immoral (Zerubavel 1991). Moral boundaries are an important form of symbolic boundaries that provide an understanding of cultural differences between social groups (Lamont 1992). Moral boundaries are drawn on the basis of moral character; they are centered on qualities like honesty, work ethic, personal integrity and consideration for others (Lamont 1992). However, they also legitimize racist beliefs, stereotyping and categorizing (Lamont 2000) since people feel superior to those that they think possess low moral standards (Lamont 1992). For example, in her ethnographic study Lamont (2000) shows that lower middle class workers in the US draw both class and racial boundaries depending on their moral worldviews. White workers draw boundaries against professionals and managers, often judging this group as lacking integrity and sincerity. While white workers see blacks as lazy and lacking work ethic, black workers see whites as domineering and filled with middle class egotism. Therefore, in the contemporary US, moral boundaries become racial boundaries.

Social-structural Theories

While socio-cultural theories focus on how racial bias and discrimination are constructed through cultural messages and practices, social-structural theories emphasize the role of a stratified social structural system organizing racialized interactions. In this view especially important are the roles of class struggle, group conflict, power and social dominance in perpetuating racial inequality. Social-structural theories focus on how realistic group conflicts over resources shape status hierarchies and how dominant groups perpetuate their group positions via seemingly race-neutral ideological practices. This framework allows for an approach that can systematically account for class distinctions modulating or moderating racial inequalities. Additionally, in this account, contemporary racism is not 'new' (in contrast to New Racism theories), but it is a continuation of a historically oppressive social system. Moreover, unlike individualistic and relational theories trying to reveal the universal mechanisms of racial bias, social-structural theories bring culturally and structurally specific explanations to racism.

Prejudice as Group Position ("Laissez-faire Racism", "Systemic Racism")

Anchored in Blumer's theory of prejudice (1958), theories following this framework argue that racism consists of a sense of group position that is derived from feelings of inter-group competition and hostility constructed collectively through a historical process whereby the dominant racial group defines its position in contrast to subordinate racial groups' positions (Bobo 1988, 1999). Accordingly, this group position is shared by the members of the group (with varying degrees) and elicits similar antagonistic feelings in both the elite and the low status members of the dominant group towards subordinate out-group members (Bobo et al. 1997). Similar to the socio-cultural theories of racism (e.g. symbolic racism, modern racism), this body of literature also argues that racial bias in the U.S. has shifted from blatant Jim Crow racism to a more

subtle, laissez-faire racism characterized by a seemingly meritocratic and free-market ideology that is in essence racist (Bobo et al. 1997). Different than socio-cultural theories, however, these theories emphasize the role of the historical socio-political and economic relations in the transformation of American racism and the importance of power hierarchies and social dominance (control over resources) (Bobo 1988, 1999, et al. 1997; Bobo and Hutchings 1996). These arguments are also echoed by the racial formation theory, which emphasizes that race is constructed through the historical social, political and economic forces to sustain stratified social relations and cultural dominance (Omi and Winant 1994).

In this view, dominant racial group members actively strive to maintain their group position and privileges. The motivation to maintain and perpetuate group privileges underlies whites' opposition to various race-targeted public policies such as school busing or residential integration (Bobo 1983; Bobo and Kluegel 1993; Bobo and Zubrinsky 1996)[5]. Moreover, despite the fact that there is greater class division among the African American community than the past, racism against blacks is reproduced more uniformly and blacks as a group are in a more disadvantaged position as can be seen in black-white gaps in employment status, material wealth, incarceration rates and urban segregation (Bobo et al. 1997). Thus, race in the U.S. becomes a status marker by placing African Americans at the bottom of the hierarchy through unequal allocation of resources and discrimination (Feagin 1991; Gans 1999, 2005; O'Brien and Feagin 2004). Thus, in contrast to scholars like Wilson (see Class-based Race Inequality section), researchers in this tradition argue that (and document with qualitative methodologies), independent of

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[5] Another set of structural-ideological theories that try to explain opposition to race-targeted public policies are those that focus on political ideologies and conservatism (Sniderman and Carmines 1997; Sniderman and Hagen 1985). These theories argue that fiscal conservatism and attitudes toward government rather than racism shape opposition to equal treatment policies; however, several studies that control for nonracial factors still find that racial attitudes have a stronger impact than non-racial political attitudes (e.g., Kinder and Sanders 1996; Sears et al. 1997).

their objective class status, African Americans are systematically discriminated against in public spaces (Feagin 1991).

Color-blind Racism

Color-blind racism theory argues that while white Americans avoid acknowledging or talking about racial bias and discrimination, seemingly nonracial institutional and individual level practices perpetuate racial inequality (Bonilla-Silva 2010). In this view, no longer an acceptable public ideology, racial prejudice in the U.S. is rooted in the American moral system, what Bonilla-Silva calls a 'racialized social system' (2001:22). This system constitutes a set of social practices created by the actors in dominant positions that seems overtly non-racial, but covertly sustains a 'color-blind racist' ideology that maintains the racial status-quo (Bonilla-Silva 1997, 2000, 2001, 2003). Embedded in this moral system is an illusion of egalitarianism masking the racial status-quo through promoting the idealized notions of the American meritocratic system in which social mobility is attained by everyone who is ambitious, skilled and works hard –or the so called 'American Dream' (Akom 2008; Bonilla-Silva 2001). Color-blind racism theory argues that white Americans sustain the unequal racial status-quo through four frames. First, by using abstract liberalism, white Americans justify the 'deservedness' of those in the bottom of socio-economic hierarchy due to their lack of merit and competition rather than racial discrimination (Bonilla-Silva 2010). Second, through naturalization, whites ignore a long-standing history of institutional segregation practices or redlining practices justify social phenomena like residential or schooling segregation as natural phenomena occurring due to people's nature to be around those similar to themselves (Bonilla-Silva 2010). Third, through cultural racism discourses, white Americans attribute the reasons for the disadvantaged social position of people of color to their cultural practices and family values, akin to blaming the victim. Fourth, relying on minimization white Americans continuously undermine the role of

discrimination in modern day society and disapprove of those remarking the importance of racism and discrimination (Bonilla-Silva 2010).

Class-based Race Inequality Approach

Rooted in a Marxist theoretical framework, class-based race approaches emphasize the importance of class dynamics in maintaining racial inequality. While theories following a class-based approach often disregard individual-level bases of racism and take a macro-level approach with specific emphasis on labor market relations, their propositions still have implications for individual-level racism. Therefore, I include them in this chapter. Among the earliest advocates of this view, Oliver Cox (1948) argued that black-white relations in the U.S. are a type of class-conflict and racial oppression is tied to the exploitation and domination by the capitalist class. Similarly, Edna Bonacich (1972) proposed Split Labor Market theory, holding that a market split channeling ethnic minorities into lower paying jobs constitutes the basis for ethnic antagonisms within the working class.

Based on this split market approach, William Julius Wilson (1978) has infamously put forward the argument that social class has surpassed race in determining the life outcomes of African Americans. As a result, the issue of the role of class in racial inequality has gained wide scholarly attention. Wilson observed (originally in 1978, also see Wilson 1987, 1996 and 2009) that while a growing body of African Americans have transitioned into the middle class and now faced limited overt discrimination, a substantial portion of African Americans living in the inner cities have become increasingly marginalized, constituting the urban ‘underclass’. Some empirical research supports these arguments documenting that the wage disadvantages of African Americans have reduced substantially in the latter half of the twentieth century (Sakamato, Wu, and Tzen 2000). Therefore, this view assumes that individual-level race bias is no longer prevalent while class bias is potentially important and ubiquitous.

Intersectionality

Wilson's argument for the declining significance of race has been challenged by many scholars documenting substantial black-white income and wealth gaps (Avery and Rendall 2005; Oliver and Shapiro 1995; Thomas 1993; Thomas and Horton 1992; Western and Pettit 2000) as well as continuing discrimination faced by blacks (Feagin 1991; Feagin and Sikes 1994; Pager and Shepherd 2008; Pager 2008). Nonetheless, these inquiries gave way to a new research paradigm that considered the simultaneous experience of race and class rather than the effects of one relative to the other (see Cole and Omari 2003 for a review). This new paradigm is referred to as 'intersectionality' (pioneered by feminist scholarship and legal theory, e.g., Crenshaw [1989]1993, 1994) focused on the experiences of individuals occupying multiple social positions (such as gender, race, and class). Accordingly, while race and social class have overall main effects (additive effects), they also have a joint (or multiplicative) effect over and above these main effects (Pettigrew 1981; Hancock 2007). Thus, for example blacks who have attained a middle class status have life experiences that are uniquely different from middle class whites but also from working class blacks.

Qualitative studies of African American high school students in elite, predominantly white schools demonstrate that, despite the fact that these students are similar to their white counterparts in terms of socio-economic position (in that they all are from upper middle class families with parents working in professional occupations), black students are continuously marginalized in their academic experiences through physical or social exclusion (Cookson and Persell 1991; Horvat and Antonio 1999). Moreover, middle class or professional blacks also continuously experience status downgrading in their public lives whereby they are stereotyped to be lower class, criminal, or aggressive (e.g., Feagin and Sikes 1994; West 1994). Similar arguments are also posed by Segmented Assimilation theories suggesting that recent immigrants' assimilation into different socio-economic positions (economic mobility) is segmented

due to their experiences of racial discrimination (Neckerman, Carter, and Lee 1999; Portes and Zhou 1993; Portes and Rumbaut 1996). However, so far the majority of the research on intersectionality has focused on the experiences of the minority group members. Moreover, although there is a considerable amount of research on the intersections of race and gender (e.g., Bell and Nkomo 2003; Browne and Kennelly 1999; Weber 2001) or stereotypes regarding black politicians (e.g., Schneider and Bos 2011; Sigelman et al. 1995; Terkildsen 1993), there is still limited research on how the intersections of race and social class might impact bias (Cole 2009; Weeks and Lupfer 2004).

While not strictly about the intersection of class and race, Expectation States Theory (EST) is among the few social psychological theories that take into account how simultaneously holding multiple group memberships influences micro-level interactions. This operationalization of race and class can be traced to work by Joseph Berger and his colleagues (Berger, Cohen, and Zelditch 1972; Berger, Conner, and Fişek 1974) attempting to explain how status hierarchies form in collectively oriented task groups. EST and its offshoot Status Characteristic Theory focus on the role of status characteristics like race or gender on micro-level behavior and evaluations (Berger, Fişek, Norman, and Zelditch 1977; Berger, Ridgeway, and Zelditch 2002; Berger and Webster 2006). According to the theory, actors in a small task-oriented group will evaluate each other and generate expectation about members' performances depending on others' salient status characteristics. For example, if a person has an unfavorable status characteristic (such as being female), then she will be evaluated less favorably by the group members, leading to less prestigious positions in the group. This whole process is called status generalization and leads to further detrimental outcomes across multiple settings for actors with low status characteristics. As these actors will not be given opportunities to perform better in the group, they will be evaluated poorly and will in turn end up fulfilling this prophecy by not being able to perform better.

Using laboratory experiments, studies following EST have demonstrated that blacks and darker skinned Hispanics are evaluated less favorably than whites and lighter skinned Hispanics (Biagas 2010; Cohen 1982; Cohen and Roper 1972; Goar and Sell 2005; Webster and Driskell 1978). In EST, status characteristics have an additive effect such that a person who carries two higher-ranking status characteristics (e.g. white middle class) will be favored more than someone with one lower and one higher-ranking status characteristic (e.g. middle class black). However, while theoretically accounting for intersectionality, research in this theoretical paradigm has not focused on the intersections of race and class. Moreover, EST is also criticized for having a simplistic cognitive model of information processing and not taking into account the actor's ideologies, values, motivations or agency (Knottnerus 1988).

Emergent Themes, Unanswered Questions

Various common themes (either implicated in their theories or revealed by their findings) emerge from these theories. The first is that modern racism no longer relies on explicit, overt beliefs, but rather implicit and often non-conscious mechanisms (i.e. implicit attitudes). As research on implicit attitudes reveal even people who are explicitly holding racially egalitarian ideologies still contribute to racial bias in covert ways. The second theme involves the importance of emotional and affective prejudice in contemporary racism. Through a blend of aversive and moral emotions racism is sustained and enacted. The third emergent theme is the significance of moral ideologies in racial bias. Of course, these three themes are inter-related manifestations of the societal changes that have been taking place in the post-Civil Rights era. Because blatant racism is no longer acceptable to show in most public spaces, modern racism does not depend on biological or other deterministic arguments that pose genetic superiority or inferiority of racial groups; it relies heavily on arguments that revolve around moral superiority or inferiority of racial groups. Racism in its subtle form, disguised under moral reasoning

and manifested in emotions, justifies itself as it is now anchored in socially acceptable notions of morality.

The theories outlined here also lead to some unanswered questions. I will briefly touch on two of the most important. First: What is the relationship between implicit attitudes and emotions? While implicit attitudes are often considered to be affect-based, their relationship with automatic affect or emotions (physiological affect accompanied with cultural labels, Thoits 1989) is not well understood or theorized. It is unclear what implicit attitudes are, how they are formed and experienced and even to what degree they are unconscious (see Blanton and Jaccard 2008 for an elaboration). My dissertation sheds light on these issues through employing implicit measures like reaction times and brain activation as well as explicit measures of emotional reactions.

The second question that I will only briefly discuss is: What is the role of class differences in racial bias? America is a highly stratified society with high levels of class inequality (Weeden et al. 2007; Western and Wright 1994; Wright 1997). However, social class divides racial groups in distinct ways. For example, middle class blacks are substantially less wealthy than their white counterparts with similar education and income levels (Conley 1999). Moreover, white Americans' assumptions about others' socio-economic status depend on their racial background (black Americans are more likely to be considered lower SES, e.g., West 1994). However, despite shifting interest in the intersections of race and class on the social, psychological and material well-being of blacks, there is little research on how this intersectionality affects the majority groups' perceptions and racial attitudes. Therefore, my dissertation addresses this issue by examining how socio-economic positions modulate race bias by collecting responses to pictures of black and white people embedded in different socio-economic locations.

While this chapter focused on traditional social scientific and psychological approaches, the following chapter will bridge this literature with neuroscience research in pursuit of a more nuanced and complex theory of racism. Racism is adapting to a

changing world by transforming into a covert form rather than fading away; yet, theories of racism have yet to adapt their theories and empirical strategies to capture these subtle mechanisms. While research focusing on implicit attitudes fails to link racial prejudice to larger scale societal influences including morality, theories highlighting socio-cultural and social-structural dynamics rarely investigate the emotional mechanisms underlying racial prejudice or try to capture the affective and bodily mechanisms of emotions via survey methodologies. Social biases including racial bias are bodily and cognitive phenomena; they are experienced and enacted through our bodies and our brains. Traditional experimental techniques like behavioral responses or survey methods are indirect ways of measuring these cognitive processes. Nonetheless, findings from an increasing body of neuroscience research challenge as well as extend the traditional social scientific research (see Franks 2010, 2013). Taking advantage of an interdisciplinary research framework incorporating neurology, this dissertation extends individual-level theories of racism by building a new theory to account for some of the inconsistencies across these theories.

CHAPTER 3: APATHETIC RACISM THEORY

> The harder it is to exercise direct domination, and the more it is disapproved of, the more likely it is that gentle, disguised forms of domination will be seen as the only possible way of exercising domination and exploitation.
>
> Pierre Bourdieu, *The Logic of Practice*

The previous chapter reviews the current literature and suggests that in the contemporary U.S., American meritocratic standards of morality are the basis upon which racial boundaries are drawn. Accordingly, idealized moral notions like individualism, work-ethic, obedience and discipline perpetuate and justify discriminatory beliefs, attitudes and behavior (Kinder and Sears 1981; Sears, van Laar, Carrillo, and Kosterman 1997). This means that contemporary forms of racism base group distinctions on 'earned' results and behaviors, rather than something essential about the group. Thus, prejudice can be cloaked in a supposedly meritocratic ideal, within a social system that is not as meritocratic as the ideology makes it appear. However, while the social scientific body of literature on race and prejudice demonstrates that racial prejudice is nourished and augmented by conventional societal notions of morality. It neglects the subtle emotional processes through which prejudice operates and fails to specify how social class contextualizes race bias. This disguises and distorts the nature of both morality and racism, leaving social scientists less prepared to understand and potentially ameliorate such issues, and obscuring how post-racial attitudes at one level still serve to perpetuate racial inequality by suggesting current inequalities are legitimate due to being based in a supposed meritocracy.

In order to build a properly grounded theory of the moral basis of racial prejudice, I propose apathetic racism theory, a neurosociological approach bridging sociological notions of emotions as cultural constructs with psychological and neuroscientific arguments supporting the strong role that emotions play in racial discrimination.

Accordingly, what characterizes contemporary racism is not a blatant animosity or antipathy but rather a moral emotional apathy that is modulated by social class membership. This moral apathy constitutes a state of emotional indifference towards out-group race members.

This dissertation offers a novel contribution to understanding contemporary anti-black racial bias by distinguishing between two types of apathetic racism: a) *sympathetic gradationalism* against those within the in-group class (middle class) that includes high approach/low avoidance moral emotions, and b) *blended racism* against those within the out-group class (lower and upper class) that is experienced through a combination of high avoidance and low approach moral emotions. This distinction is important because I further argue that while this sympathetic gradationalism takes a non-conscious form since it consists of seemingly positive evaluations, blended racism is conscious and self-generated as a dislike against out-group social class members that is justified by the meritocratic standards of competition and is thus often socially more acceptable. Hence, despite the growing attention and importance of automatic and non-conscious emotions in racial evaluations, conscious and self-generated emotions might still be playing a role in race bias. In other words, people exhibit an unconscious form of bias against members of one's same class-group, there is a stronger, more overt, supposedly meritocratic bias against members of lower and upper social classes.

Moral apathy is a passive form of racism rather than an overt form of aggression and hostility; hence, it has been harder to detect. I argue for a neurosociological approach that can capture the subtleties of the emotional mechanisms of race bias. Relying on an established body of research suggesting that there are separate neuro-physiological structures underpinning distinct motivational systems (Bradley et al. 2001; Darwin 1955 [1872]; James 1980; Lane et al. 1997), I argue that the two different types of racism are associated with separable neural correlates. This suggests that encountering blacks and whites from different social statuses triggers different evaluative processes, a distinction

that is not fully explored in either sociology or social neuroscience. While the ventromedial prefrontal cortex (the VMPFC, brain region involved in empathy and moral emotions) is the key for sympathetic gradationalism, the amygdala (brain regions associated with detection of threats) and the insula (crucial for conscious emotions) are crucial for blended racism. This view helps me elucidate how society's moral codes become operational within the human mind, contributing to observed patterns of interaction and resource allocation. In the following sections, I elaborate on the elementary tenets of this theory and at the end offer testable predictions and a summary.

Racial Boundaries Rely on Morality

Morality, from a sociological perspective, revolves around the evaluative cultural codes that specify what is right or wrong, good or bad, acceptable or unacceptable (Turner and Stets 2007). Morality can be thought of as sets of standards, bright lines and bright lights distinguishing between 'shoulds' and 'should nots', that individuals use to orient themselves in the social world (Hitlin 2008). These moral standards are defined by structured patterns of social relationships (Schwalbe 1991) and shared inter-subjectively and institutionally (Smith 2003). As embedded in the structured environment in which people live, these individual-level moral standards are shaped by the cultural resources made available by national historical and religious traditions, educational systems, and the mass media as well as the structural conditions such as social class, market position, and social networks (Lamont 2000). Accordingly, morality is not an abstract, universal system of normative and descriptive parables, it is a web of interlocked organic and dynamic systems encompassing (sometimes competing) thoughts, feelings, and actions that individuals actively construct and reconstruct to define and signal the in-group and to exclude the out-group –draw boundaries (Durkheim 1995[1912]; Hitlin 2008).

People feel superior to those that they think possess low moral standards; thus, moral evaluations centered on qualities like honesty, work ethic, personal integrity and

consideration for others legitimize racist beliefs, stereotyping and categorizing (Sayer 2005, 2010). Therefore, in the contemporary US, moral boundaries become intertwined with racial boundaries. Moral boundaries become crucial for upholding racism in the U.S. because individuals justify racism by considering it moral, right and appropriate. Modern racism does not depend on biological or other deterministic arguments that pose genetic superiority or inferiority of racial groups. Instead, it relies heavily on moral arguments that revolve around moral superiority or inferiority of racial groups. Likely, this lets people who possess prejudiced beliefs anchor their reactions in a more socially acceptable notion of morality, and less in a culturally unacceptable sense of biological inferiority.

Moral standards are structurally and culturally influenced, but morality is not simply socially constructed. The capacity to draw moral boundaries appears hardwired into human beings through evolution (Haidt et al. 2007; see Turner 2010 for a sociological discussion) and sustaining a local moral order is one of the central motivations for human beings (Rawls 2010; Smith 2003). Like every other action, thought and feeling, morally charged racial attitudes and biases are enabled by our biology and represented in our brains. However, sociological approaches to boundary making and even psychological theories of stereotypes and prejudice largely fail to take into consideration the basic biological processes enabling social bias. A lack of dialogue between sociological theories and the biological approaches to social behavior contributes to erroneous assumptions about the bio-cognitive mechanisms underlying social behavior. Yet, without this knowledge theories about social life are incomplete. For example, only at the turn of the 20th century with novel research on the brain mechanisms of morality did we learn that human morality relies more heavily on emotions than cognition, as traditionally have been assumed (see Firat and McPherson 2010 for a review). Yet, while we know emotions are important, we still know little about the mental processes of the moral boundaries of race. This dissertation argues that

emotions organized by motivational systems and represented in distinct brain regions underlie race bias.

Moral Boundaries of Race are Emotional

The capacity for emotions in humans is vital for making evaluations of the moral quality of ourselves and others (Sayer 2005), which arises from the need to see ourselves and our in-groups as moral and distinguish 'us' from 'them' (Hitlin 2008). Emotions are cultural labels applied to appraisals of a situation or a stimulus that are accompanied with changes in physiological sensations and the free (or inhibited) display of expressive gestures (Thoits 1989). Emotions are physiological processes shaped by learning and cognition (Cacioppo and Gardner 1999). A fundamental assumption in the emotions literature is that there is a distinction between basic (or primary) emotions and moral (or secondary) emotions. While primary emotions are often considered as biological capacities evolved to cope with fundamental life struggles, and are shared and recognized by all members of human species (Ekman 1972, 1992, 1993, et al. 1987; Tooby and Cosmides 1990), moral emotions are evolved to assist in social life (i.e. guiding interaction strategies) (Haidt 2003, et al. 2007; Fiske 2002), and thus are culturally structured and shared (Lamont 1992; Turner 2000; Turner and Stets 2007).

Catalyzed by our important subgroups (such as family, friend groups, or workplace), we internalize norms and values and associate them with the appropriate moral emotions, behavior or body states. For instance, mortuary science students acquire the emotional perceptions and management skills required to normalize working around the dead through a process of socialization (both in their educations and in their lives prior to school) (Cahill 1999). Moreover, emotions are embedded in moral boundaries that perpetuate group identity. An example of this can be seen in how a university-based evangelical Christian organization uses happiness as a symbolic boundary to make claims

about in-group moral position (proving that they are good people) and as a mechanism of social exclusion (Wilkins 2008).

From a sociological standpoint, emotions are intrinsically linked to cultural norms (Hochschild 1983; 1988) as well as power and status hierarchies (Kemper 1981, 1987, 1991) and therefore they are important mechanisms in interpersonal evaluations (Smith-Lovin 1990; Robinson and Smith-Lovin 2006), social exchange processes (Lawler 2001; Lawler, Thye, and Yoon 2000) as well as in self and identity processes (Burke 1991, 1996). I build on this general sociological approach to link emotional mechanisms more accurately with racial prejudice. However, as also acknowledged by many sociologists, biological and emotional *mechanisms* underlying social behavior are often neglected by sociologists and that the models described in the previous chapter are incomplete (Massey 2002; Turner and Stets 2006).

In contrast to sociology, the fields of psychology and neurology have been quite concerned with emotions, both in general and with respect to racism, for the past few decades, partially due to the advancements in neurological methods like non-invasive brain imaging technologies and the "affective revolution" of the 1980s (that placed affect and emotions at the core of cognitive sciences). These neurological approaches to morality have brought a theoretical breakthrough from the rationalist approaches that have long dominated the study of morality in psychology. According to the classical moral psychological tradition pioneered by Jean Piaget (1965) and Lawrence Kohlberg (1969, 1971), human moral cognition relies on the development of a moral calculus via internalization of universal moral fundamentals, and this moral calculus is based in moral judgments operating as rational calculations and deliberate reasoning. This evidence has led to a paradigm shift in the science of morality by placing emotions at the core of contemporary research. Accordingly, emotions evoked by the rapid and automatic cognitive appraisals of interpersonal events play a dominant role in moral judgments and behavior (Damasio 1994; Greene 2007a, 2007b; Haidt 2001, 2008, et al. 1993, 2007).

One of the leading theories of this new perspective, the "Somatic Marker Hypothesis" (Damasio 1994, et al. 1991, 1996), explains that our bodies generate responses (preferable vs. not) through a combination of prior experience and future anticipation. If an initial positive experience with a stimulus leads to a pleasurable somatic state, our bodies record this state by generating somatic markers. Thus, in a future situation with the possibility of the engagement with same stimulus, our bodies bias our preferences towards that stimulus (over another) by activating these somatic markers (even when the positive outcome is absent). These markers express themselves in emotions and affect our value-relevant decisions before we logically deduce decisions. Damasio and his colleagues support this hypothesis with brain lesion studies in which patients with damage to the ventromedial prefrontal cortex (the brain region involved in emotional regulation) show impaired moral, emotional, and judgmental responses (Damasio 1994, et al. 1991, 1996) Strong aversive reactions shape all manner of supposedly logical judgments, suggesting ways that societal influences on these somatic markers might shape people's racial outlooks and reactions without their being consciously aware of their origin.

Jonathan Haidt further augmented the role of emotions in morality with his "Social Intuitionist Model" that explicitly challenges the traditional moral psychological perspective (Haidt 2001, 2008, et al. 1993, 2007). According to this model, moral intuitions are fast, automatic, and affect-driven cognitive processes, and are central to moral conclusions. They do not force, but rather push moral conclusions outside of conscious awareness; these intuitions emerge outside of conscious awareness, but channel logical thinking toward unconsciously chosen ends. They can be overridden by a post-hoc reasoning process that is slow, intentional and effortful (Haidt, 2001, et al. 2007), but this rarely occurs, though social influence is often important in triggering this overriding process. Areas related to emotional processing are found to be activated while viewing morally stimulating pictures (Moll et al. 2005, 2007) or engaged in personal

moral dilemmas which stimulate the subjects to envision themselves taking direct action in the presented moral dilemma –e.g. pushing someone in front of a trolley to save five other people (Greene et al. 2001).

While the study of morality is almost fully divorced from the study of racism, mainstream psychology has also turned its attention to the role of emotions in prejudice. Accordingly, the cognitive component (like stereotypes) is not as strong of a predictor of discrimination as emotions (Talaska, Fiske, and Chaiken 2008) and it is more likely to be biased as a result of respondents' conscious avoidance in reporting true answers to the questions due to social desirability bias (the tendency of individuals to project favorable images of themselves during social interaction) (Crowne and Marlowe 1960). Therefore, recent research on racial prejudice highlighted the importance of the affective component (Fiske 1982; Fiske, Cuddy, Glick, and Xu 2002; Gaertner and Dovidio 1986; Greenwald and Banaji 1995; Glassner 1999). This literature is loosely based on the classical motivational-systems approach that distinguish between two primary motivational systems underlying emotions: a) appetitive (approach) and b) aversive (withdrawal or defensive) motivational system (Bradley et al. 2001; Dickinson et al. 1979; Lane et al. 1997; Lang 1995).

Among the pioneers of emotional prejudice research, Fiske and her colleagues use a similar typology, whereby perceptions of others' warmth and competitiveness lead to four types of prejudice related with distinct moral emotions: envy, pride, disgust and pity (such as envious prejudice towards rich and Asians or feelings of pride for middle class people and whites) (Cuddy et al. 2009; Fiske and Cuddy 2006; Fiske et al. 2002; Lin et al. 2005). Building on this body of research, I take a motivational systems approach that organizes emotions around two primary motivations: a) approach and b) avoidance, four moral (envy, pride, disgust and pity) and four basic emotions (anger, happiness, fear and sadness). Accordingly, emotions are action dispositions that reflect preparation for action; they are "motivationally tuned states of readiness" (Lang 1995: 373).

Approach and avoidance processes orient the organism's internal states towards external stimuli by motivating behavior. While approach motivation drives behavior toward rewarding and pleasurable stimuli, avoidance motivation drives behavior away from stimuli or situations that are threatening and un-pleasurable (i.e. punishment) (Andersson 2013; Elliot 2006; Elliot and Covington 2001). Approach and avoidance motivations are distinct systems because they motivate behavior different in their goals. Approach motivation might both drive behavior towards something desirable or might minimize activity (or behavior) to sustain it. Similarly, avoidance motivation might stimulate escape behavior to avoid something displeasing or inhibit behavior to refrain from meeting it.

In this view each emotion can be categorized with regards to both approach and avoidance dimensions. For example, emotions that are high in avoidance but low in approach (e.g., "despising immigrants") would motivate a blend of behaviors that are not only low in approach or activity (i.e. lack of action, "would not talk with the immigrant co-workers") but also high in aversion or inhibition (i.e. take action to avoid, "taking a longer way back to home in order not to cross the immigrant neighborhood"). Emotions that are high on both approach and avoidance, on the other hand, ("grudging immigrants") would motivate behaviors that are high in both avoidance and approach (i.e. confrontational action, "attending anti-immigration rally").

These theories of basic, primary emotions inform the study of more complicated social/moral emotional evaluations. I suggest that similar to primary (or basic) emotions, moral emotions can be categorized in four general domains on a bivariate motivational system (see Figure 3.1 for an illustration). I suggest that moral boundaries of race work through these two emotional systems such that whites draw moral boundaries against blacks in the form of feeling more intense moral emotions towards whites than blacks.

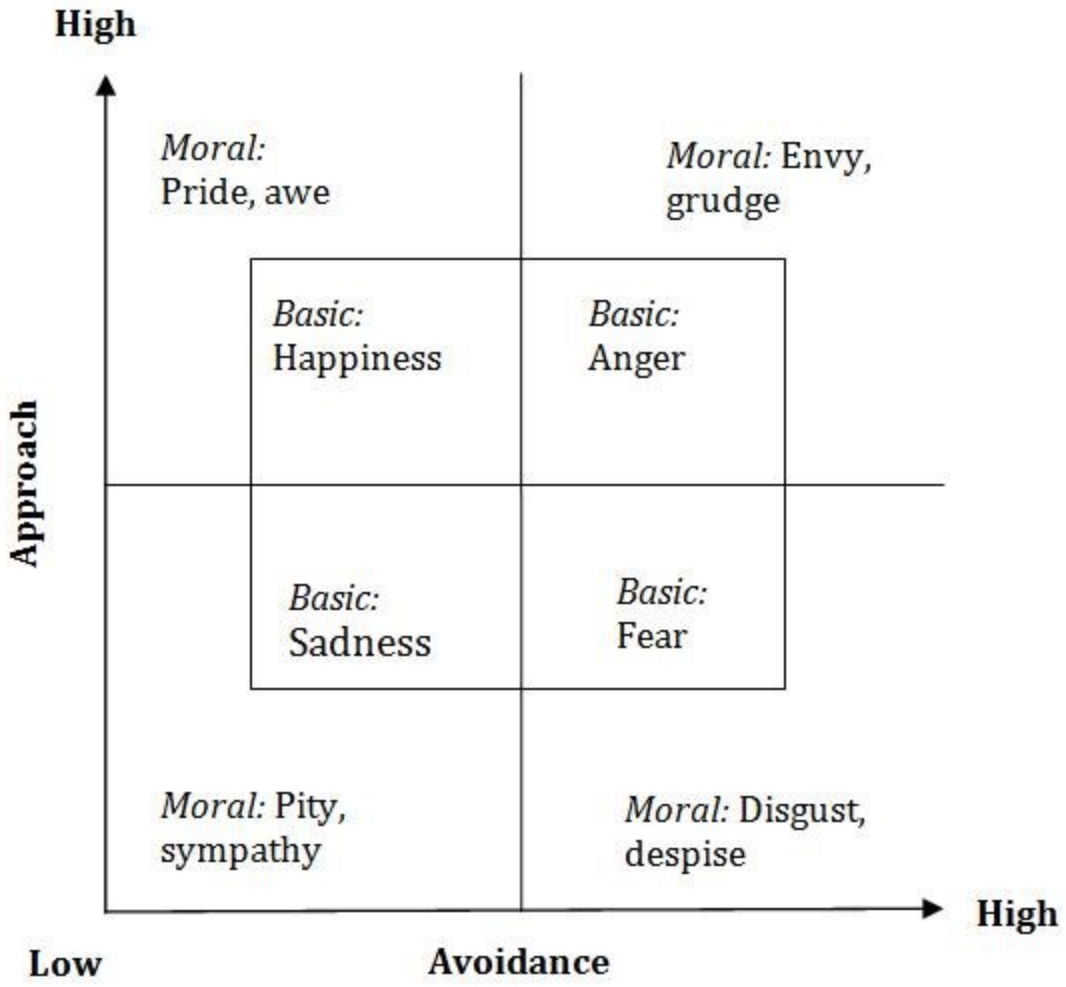

Figure 3.1 Illustration of the bivariate motivational system.

Moral Boundaries of Race are Modulated by Social Class

Social class[6] is an important base for the construction of self and identities (through presentations and conceptions of self, i.e. self-esteem, Hout 2008; Urciuoli 1993) as well as group distinctions via residential and educational segregation, and

6 I use the term social class in line with the definition of Fiske and Markus (2012:10): "an ongoing system of social distinction that is created and maintained through implicit and explicit patterns of social interaction." Accordingly, while social class is socially constructed and subjectively interpreted, it is also an objective reality that is externally experienced and recognized (Hout 2008; Jackman and Jackman 1983).

interpersonal relations (i.e. homophily in marriage and friendship networks) (Hochschild and Scovronick 2004; Schneider and Buckley 2002; Horvat, Weininger, and Lareau 2003; Schwartz and Mare 2005). However, contemporary social psychological theories of racial bias largely fail to take into account social class into their analyses, instead simplifying the relationship between morality and prejudice by assuming an all-encompassing anti-black racial prejudice that targets 'all' blacks as a unified abstract collectivity (Lott 2002; Weeks and Lupfer 2004). Earlier studies and few contemporary ones, on the other hand, demonstrate that blacks that have achieved American meritocratic ideals are regarded more positively than those who have not.

For example, classic experimental research shows that the desired social distance from a black target decreased (showing reduced prejudice) as the target's social status increased (Westie 1952), and blacks that seem to be from lower socio-economic positions received less help than those that seem to be from higher socio-economic positions (Piliavin, Rodin, and Piliavin 1969). A more recent study finds that race becomes the most salient attribute in categorizations of lower social class blacks, while social class surpasses race in categorizing middle class whites and blacks (Weeks and Lupfer 2004). Moreover, various studies show that employers for entry-level jobs are prejudiced against inner-city blacks that are coming from lower socio-economic positions (Moss and Tilly 1996; Neckerman and Kirschenman 1991; Pager and Shepherd 2008; Pager 2008; Shih 2002). However, prejudice is still a significant factor in less-privileged class positions since whites who have not achieved the same ideals are not perceived as negatively as blacks; middle and upper class blacks are still very likely to be discriminated against (Feagin 1991; Feagin and Sikes 1994; Kessler et al. 1990; Schneider and Bos 2011). Here, I offer a mechanism that can unify and organize these seemingly competing arguments on whether or not blacks in different socio-economic positions are more or less discriminated against. I suggest that race bias takes different forms depending on the

target's social class position, thus demonstrating how current class-based meritocratic ideals have merged with issues of race within American society.

I suggest that class modulates the race bias by eliciting different types of emotions through a combination of approach and avoidance motivations. For example, middle class people, in American culture, are considered as the reference or "cultural default" (Fiske et al. 2002: 881) that become the valued societal ideal. Most Americans view themselves as middle class even when their objective class positions are lower or upper, and therefore show an in-group bias associated with warm and positive feelings such as admiration and pride for the middle class "in-group" (Cuddy et al. 2009). Therefore, I argue that moral emotions that are high on approach and low on avoidance (i.e. pride, awe and admiration) are felt most strongly towards those from middle class groups forming the basis of sympathetic gradationalism. Yet, these emotions will be evoked less by racial out-groups within middle class constituting a subtle moral exclusion. Elucidating this mechanism would help explain previous research that observes persistent racial discrimination against the middle-class blacks (e.g., Feagin 1991; Feagin and Sikes 1994)

On the other hand, research shows that many out-groups are associated with ambivalent stereotypes and thus receive a mixture of positive and negative feelings. For instance, people with higher socio-economic standing (i.e. rich people) are envied for their perceived status, but are also disapproved and detested for their perceived hostility and rivalry with the in-group (Cuddy, Fiske, and Glick 2008; Fiske et al. 2002). Moreover, middle class people are often emotionally distant from poor people, toward whom they feel a combination of disgust or pity feelings, most likely due to a lack of interaction with poor people in their daily lives and a lack of media representation of the poor (Berrick 1995; Bullock, Wyche, and Williams 2001; Fiske, Xu, Cuddy, and Glick 1999). Therefore, I suggest that a combination of moral emotions high in avoidance and

low in approach is most strongly felt towards upper and lower class people constituting blended racism.

The dissociation between sympathetic and blended racism is crucial because it extends our understanding of bias from conscious to non-conscious, and therefore provides an important base for investigating the covert mechanisms involved in prejudice and discrimination. I suggest that the moral emotional process favoring middle class whites over blacks is fast and often occurs non-consciously. In line with the neurological evidence on human morality (e.g., Damasio 1994; Greene and Haidt 2002; Moll et al. 2002), I argue that by evoking rapid, automatic appraisals, sympathetic moral emotions provide an initial and guiding pulse to the responses in accordance with moral cultural prescriptions. Therefore, while explicitly reporting positive emotions and attitudes to middle class blacks, I suggest bias still operates through intuitively evoking approach-type moral emotions more intensely to middle class whites. Blended racism, on the other hand, operates through conscious and overt mechanisms as it revolves around mostly aversive emotions. I contend that both blacks and whites belonging to upper and lower class groups will be considered less favorable; therefore, race bias towards blacks within these groups will be more easily justified and is thus more blatant. An evidence of the conscious operation of blended racism against lower class blacks could be employers/managers' view of blacks as lacking the characteristics of a 'good worker' such as work ethic, attitudes, and skills (Neckerman and Kirschenman 1991), not having the motivation or soft skills to succeed such as the ability to interact with customers (Moss and Tilly 1996), and being unmanageable and resisting authority (Shih 2002).

Moreover, I contend that the emotional-motivational system activated toward in-group (middle class) members is separable from that activated toward out-group (low and upper class) members, a novel contribution to understanding contemporary American racial biases. While standard social scientific methodologies like survey questionnaires or interviews fail to capture this dissociation, it will be possible to expose these mechanisms

by incorporating neurological methodologies, as the separation between these different types of racial biases will be evident in the underlying dissociable neural systems. The human brain, similar to other mammalian brains, can be divided into functionally distinct structures (Allen 2009). Following Darwin (1955 [1872]) and James (1890), the distinct motivational systems approach highlights that separate physiological structures accompany different emotions (Davidson et al. 1990; Ekman 1984). For example, Lane et al. (1997) find that there are distinct neural systems underlying pleasant and unpleasant emotions. However, there is also considerable overlap between the neural substrates of these systems (Lane et al. 1997). Therefore, while a complete dissociation between neural correlates of emotions is not plausible, differential recruitment of the brain regions representing the activation of these different systems can be measured. This approach is new to sociology, so I briefly outline below the relevant findings about the human brain and social reactions. I specify three key areas (see Figure 3.2 for an illustration) to be associated with moral boundaries of race as they pertain to different emotional systems underlying distinct types of race bias: a) For sympathetic gradationalism: The ventromedial prefrontal cortex (VMPFC), and b) For blended racism: The amygdala and the insula.

Ventromedial Prefrontal Cortex (VMPFC). The ventromedial region of the prefrontal cortex is considered to be an important center for motivation and emotional regulation (Anderson et al. 2006; Damasio 1994). This region is medially placed in the frontal region of the prefrontal cortex and is reciprocally connected to sensory cortices and limbic structures (Berridge and Kringelbach 2008; Damasio et al. 1996; Price 1999). Among the most emblematic modern examples illustrating the importance of the ventral and orbital PFC in emotional regulation is the case of patient EVR who had tumor bilaterally growing in the orbital and ventral PFC at the age of 35 (Damasio 1994; Eslinger and Damasio 1985). After the removal of the tumor with surgery, EVR experienced severe changes in his personal and social life including losing his job, going

bankrupt and getting divorced twice, despite his intellectual abilities remaining intact (Eslinger and Damasio 1985; Saver and Damasio 1991). Group studies of patients with damage to the same areas also found that these patients had blunt affect, deterioration in goal-directed behavior, seemed to get easily frustrated, showed inappropriate social behavior, and were unable to apprehend that these changes were occurring (Barrash et al. 2000).

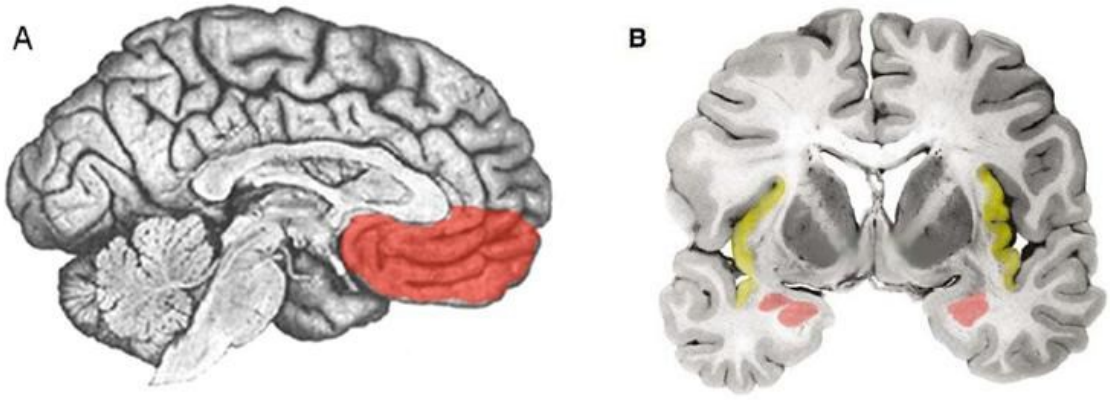

Figure 3.2 Key brain regions for moral boundaries of race: A. The Ventromedial Prefrontal Cortex in red (Adapted from Koenigs and Grafman 2009), B. The (Anterior) Insula in yellow and the amygdala in rose (Adapted from Barrett et al. 2007).

Other studies with adults with VMPFC damage also find that patients fail to show autonomic responses to socially meaningful stimuli (Damasio, Tranel, and Damasio 1990), and fail to avoid disadvantageous choices (Bechara, Tranel, and Damasio 2000). These behavioral abruptions led the behavioral syndrome caused by orbital and ventral PFC damage in adult life to be termed as ‘acquired sociopathy’ due to its close resemblance to developmental sociopathy or psychopathy (Damasio, Tranel, and Damasio 1990). Cases of early-onset VMPFC damage (during early childhood) show

even more severe social conduct problems such that these patients demonstrate criminal tendencies, show a lack of concern and responsibility and seem to be devoid of moral emotions such as remorse or guilt and are unaware of these problems while most other intellectual and cognitive abilities are normal (Anderson et al. 1999, 2000). The severity of the early-onset VMPFC patients' behavioral impairments is thought to be related to their impaired acquisition of social and moral knowledge during growing up (Anderson et al. 2000). This body of research leads to the premise that the VMPFC functions as a convergence zone that holds dispositional linkages between factual information about given situations and somato-sensory states (including emotions) through a combination of prior experience and future anticipation (Damasio 1994; Damasio, Everitt, and Bishop 1996).

Studies confirm that the VMPFC emerges as one of the primary regions for social and moral knowledge regulating moral decisions by allowing more subtle motivational and emotional factors to be weighted in judgments (Adolphs 2009; Damasio 1994; Greene and Haidt 2002). For example, various empirical studies have observed that the VMPFC is involved in social and moral cognition (e.g. Greene et al. 2001; Mitchell, Banaji, and Macrae 2005; Moll et al. 2001), an ability to mentalize others' minds (Theory of Mind, e.g. Frith and Frith 2001; Gallagher and Frith 2002; Saxe, Carey, and Kanwisher 2004), making dispositional attributions about a person rather than an object (Harris, Todorov, and Fiske 2005), and in inter-group dehumanization processes, such that it is not activated when viewing pictures of people that belong to stigmatized groups such as drug addicts or homeless people (Harris and Fiske 2006). Moreover, previous research indicates that the ventral and orbital regions of the MPFC have a more specific role in reward conditioning, pleasure and happiness (Kringelbach and Berridge 2009 for a review). Activation in this regions is correlated with the subjective ratings of the pleasantness of odors (no activation by the unpleasant odors) (Rolls, Kringelbach, and Araujo 2003), subjective ratings of the pleasantness of water in a thirst experiment (de

Araujo et al. 2003), increasing consonance of music (which covaried with subjective pleasantness) (Blood et al. 1999), perceived attractiveness of the faces (O'Doherty et al. 2003). Therefore, more activation in the VMPFC is also likely linked to high approach and low avoidance empathic and elevating emotions (like pride or happiness) felt towards in-group members.

Despite its well-established association with empathy and social cognition, to my knowledge there has only been one lesion study looking at the impact of the VMPFC on prejudice, which found that patients with VMPFC lesions showed lower gender bias than normal comparisons (Milne and Grafman 2001). However, the scarcity of research relating the VMPFC with racial attitudes is likely a result of the novelty of the topic to the field of neuroscience; neuroscientific research on racial attitudes dates only as far back to the beginning of 21st century (Eberhardt 2005). Therefore, due to its well-established association with empathy and social cognition, I suggest that the VMPFC is a key structure associated with race bias within the middle class in-group category.

Amygdala. The amygdala is a collection of nuclei in the medial temporal lobe that is highly connected to the prefrontal cortex as well as to other subcortical structures, including the hippocampus and the basal forebrain (Casebeer and Patricia 2003; Adolphs 2009). The amygdala has a key role in processing social signals of emotion, particularly fear (Adolphs, Tranel, and Damasio 1998; Dalgleish 2004; LeDoux 2000; Phan et al. 2002). Studies show that patients with bilateral amygdala damage fail to provide accurate social judgments about approachability and trustworthiness on the basis of facial appearance (Adolphs, Tranel, and Damasio 1998) and fail to recognize fear in facial expressions (Adolphs et al. 1994) as well as the arousal level of unpleasant stimuli (Adolphs, Russel, and Tranel 1999). Neuroimaging studies of emotions reveal greater amygdala activation while viewing fearful facial expressions (Gläscher et al. 2004; Morris et al. 1996) and unpleasant (Lane et al. 1997) and disgust eliciting pictures (Schäfer, Schienle, and Vaitl 2005).

The amygdala is the most studied brain region in neuroimaging studies of racial bias. Among the first neuroimaging studies examining racial attitudes, Hart et al. (2000) showed that the amygdala has an important role in face recognition of in-group and out-group races. Studies demonstrated greater amygdala activation while unfamiliar black (vs. white) faces are viewed by not only white participants (Cunningham et al. 2004; Lieberman et al. 2005; Phelps et al. 2000; Ronquillo et al. 2007) but also black participants (Lieberman et al. 2005). However, other studies comparing participants' evaluations of faces of white vs. Asian (Japanese and Korean) people also found greater amygdala activation for in-group faces (for both whites and Asians) (Chiao et al. 2008; Lee et al. 2008) compared to a fully unfamiliar out-group. This would suggest greater amygdala activation is not related to evaluations of all out-group race members; the amygdala has a general role in emotional processing since its activation is not the same for all out-group race members, but it rather has a key role in detecting the salience of emotional stimuli (Phan et al. 2002).

Ambiguous stimuli require more attention to decide whether or not the stimuli should be avoided or approached (Whalen 1998). For example, research shows that amygdala lesions impair orienting attention via gaze direction (Akiyama et al. 2007) as well as decreased activation in the visual cortex including fusiform and occipital areas while viewing fearful faces (Vuilleumier et al. 2004). Moreover, impaired recognition of fearful faces in a patient with bilateral amygdala damage became normal after explicit instructions to pay attention to the eyes (Adolphs et al. 2005). These finding are attributed to the greater signaling of social emotions in the eye region of the face and amygdala's relative involvement in evaluating facial expressions especially in the eye region (Adolphs, Baron-Cohen, and Tranel 2002). Therefore, I suggest that amygdala's role in race bias will be more specific to blended racism –against those in lower and upper class (class out-group) categories- because of the greater cognitive effort will be spent to detect whether or not people in these groups pose a threat.

Insula. The insula is a brain region buried beneath the frontal cortex and is involved in processing and integrating autonomic and visceral information including conditioned aversive learning and pain perception (see Flynn 1999 for a review). Various neuroimaging studies have demonstrated that the insula has a key role in aversive emotional systems and is activated in response to facial expressions of disgust (Phillips et al. 1997; 1998), photographs eliciting disgust (Schäfer, Schienle, and Vaitl 2005), faces judged untrustworthy (Winston et al. 2002), aversive pictures (Nitschke et al. 2006), aversive conditioning (Buchel et al. 1998), smelling a disgusting odor (Wicker et al. 2003) and also watching others smelling a disgusting odor from a video (Wicker et al. 2003).

The insula is also activated while viewing pictures of stigmatized social group members such as drug addicts and homeless people (Harris and Fiske 2006). Moreover, neuroimaging studies of racial attitudes found greater bilateral insula activation to faces of African-Americans (Lieberman et al. 2005), and correlation between the inferior insular cortex and Implicit Association Test reaction time bias in response to black vs. white faces (Phelps et al. 2000). However, damage to the insula does not necessarily impair the ability to experience disgust or other emotions (Berntson et al. 2011; Damasio, Damasio, and Tranel 2013; Straube et al. 2010). Therefore I suggest that the insula has a role in bodily, self-generated emotions rather than aversive-only emotions (Reiman et al. 1997; also see Phan et al. 2002). These results align well with other research that indicates the insula has a crucial role in integrating interoceptive (originating inside the body) states with conscious feelings such as sense of limb ownership or urges to take drugs (Naqvi and Bechara 2009, 2010; Karnath and Baier 2010). However, little research has applied this region to the broader societal issues I am exploring here. I suggest that similar to the amygdala, the insula's role in race bias will be more specific to blended racism because racism within class out-groups is more blatant and includes conscious mechanisms.

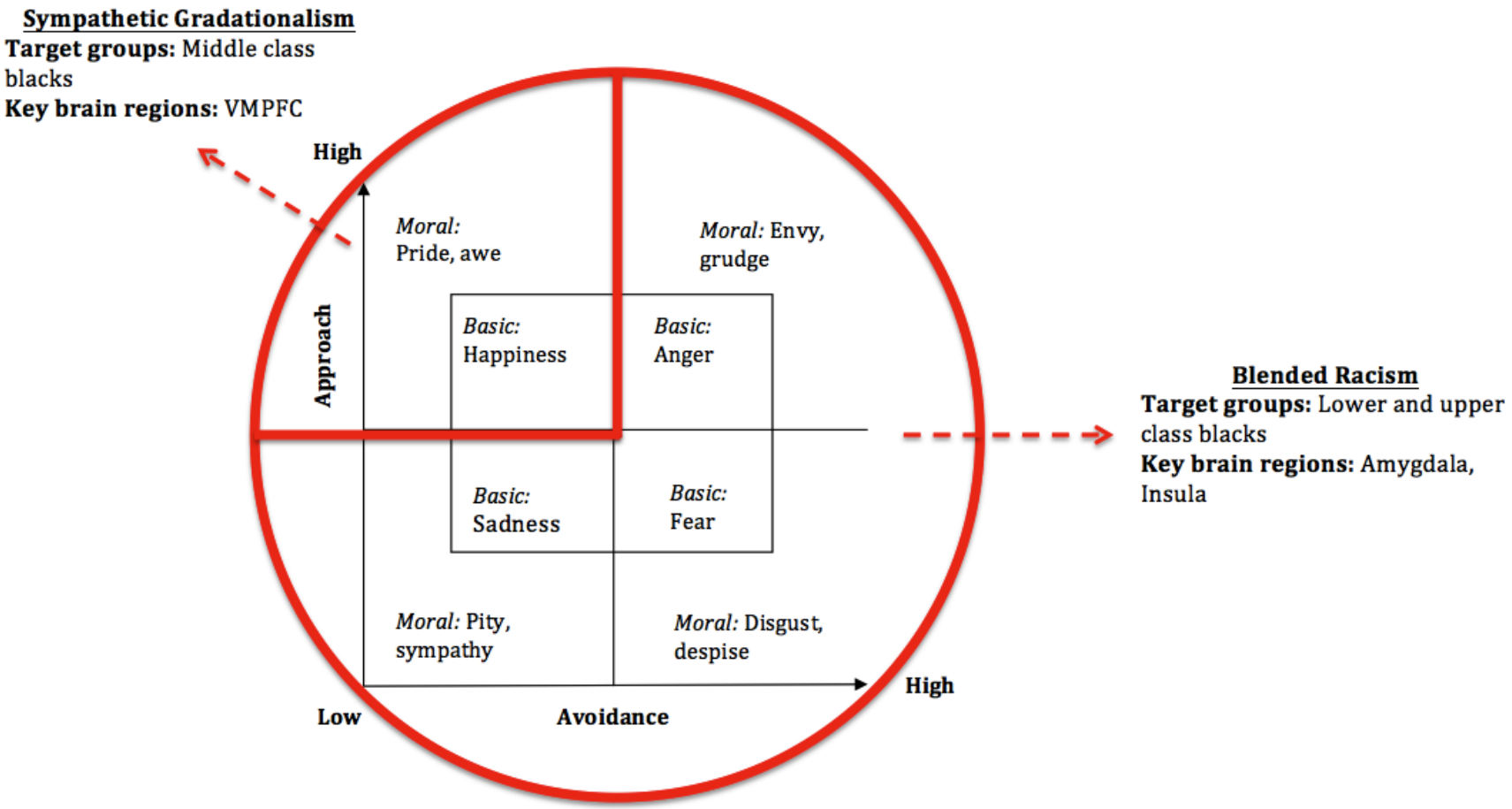

Figure 3.3 Illustration of apathetic racism theory.

Summary of the Proposed Theory and Predictions

I propose a theory of a moral-emotionally based racism that covertly legitimates current societal inequality. I argue that moral apathy constitutes the basis of contemporary anti-black racism. An ideological discourse based on valued moral qualities rooted in an American meritocratic ideal motivates an emotional apathy and indifference against blacks, whereas whites in similar situations likely trigger moral emotions that motivate concern, care and helping behaviors. This subtler form of racial prejudice that is organized by moral-emotional evaluations is not directed equally across all members of a racial group. As another salient marker of social stratification, social class modulates racial differences in emotional responses (see Figure 3.3 on previous page for a representation). Resulting is a separation between the racial biases operating within one's stratification in-group (middle class), referred to as sympathetic gradationalism, and racial biases directed at other social classes (lower and upper), referred to as blended racism. Based on the neurological literature examining morality, emotions and prejudice, I argue that sympathetic gradationalism involves emotions that are high in approach and low in avoidance and due to this seemingly positive evaluative, it relies on fast, non-conscious mechanisms.

Blended racism, on the other hand, revolves around moral emotions that are a combination of high avoidance and/or low approach; and, as it is directed against socially antagonized groups, it is more blatant and conscious. Moreover, the racial biases within the in-group and out-group rely on distinct cognitive systems, and are thus separable in the brain. While, the VMPFC is central to sympathetic gradationalism due to its role in moral empathy, the amygdala –brain region associated with threat detection- and the insula –the brain region related to conscious emotions - are the primary regions involved in blended racism.

To help concretize the theory and make it empirically testable, below I present the underlying propositions and the predictions of the theory that are tested in the following chapters.

Hypothesis #1: Participants will report feeling more intense *high approach-low avoidance moral emotions* (pride) towards middle class whites vs. blacks.

Hypothesis #2: Participants will report feeling more intense *high avoidance* (e.g., envy, disgust) or *low approach-low avoidance moral emotions* (e.g., pity) towards lower and upper class whites vs. blacks.

Hypothesis #3: Attribution of the moral-emotions (hypothesized in H#1) to whites will occur faster than that of blacks.

Hypothesis #4: The emotional rating differences between middle class whites and blacks on the *high approach-low avoidance* moral emotions (pride) will be greater in the patients with damage to their VMPFC compared to adults with no damage or brain damaged comparison groups.

Hypothesis #5: The emotional rating differences between out-group class whites and blacks on the *high avoidance* (e.g., envy, disgust) or *low approach-low avoidance* (e.g., pity) moral emotions will be smaller in the patients with damage to their amygdala or the insula than adults with no damage or brain damaged comparison groups.

Hypothesis #6: There will be increased VMPFC activation in response to white middle class vs. black middle class conditions.

Hypothesis #7: There will be decreased amygdala and insula activation in response to white lower and upper class vs. black lower and upper class conditions.

CHAPTER 4: METHODOLOGICAL OVERVIEW

This dissertation utilizes three experiments to explicate the emotional mechanisms underlying the moral boundaries of race: 1) a pictorial vignette study, 2) a lesion study with patients with brain damage, and 3) a functional Magnetic Resonance Imaging (fMRI) study. Each experiment employs the same research instruments and administers similar procedures. In this chapter, I describe the common research methodology. Methodological and analytical procedures specific to each experiment are described in the following chapters. All of the procedures and details described here and in the appropriate chapters are approved by the Institutional Review Board at the University of Iowa.

Sampling and Recruitment

This dissertation employed an availability quota sampling technique to recruit volunteers. In this non-probability sampling method; subjects who fit the study criteria described below and are within the traveling distance to the research location are recruited. While not strictly sociologically satisfying as it is not representative of the general population, this method is more feasible than a full random sampling and improves on typical sampling techniques used by many neurological and psychological experiments with undergraduate student populations (see Henrich, Heine, and Norenzayan 2010 for a critique of the mainstream sampling strategies).

The sample size for the pictorial vignette (Study 1) is 30. Previous research indicates that a sample size of 30 for higher-level units (number of subjects in my case) is adequate to achieve sufficient power to detect fixed and random effects as well as cross-level interactions (Kreft 1996; Maas and Hox 2004; Scherbaum and Ferreter 2009). Additionally, power analysis conducted with G*Power statistical tool (Faul et al. 2007) shows that I can achieve power level above .85 for moderate (.25) and large (.40) effect size conventions (determined by Cohen 1969) with a sample size of 30, for a within

factor ANOVA with repeated measures (with 8 repeated measures, a confidence level of 95%, 5% margin of error and the estimated correlation among the repeated measures is .2 or above). For the lesion study, 22 patients with brain damage are drawn from the Cognitive Neuroscience Patient Registry. These patients include those with late onset damage (patients who had their lesions after the age of 18) to the hypothesized brain regions (the VMPFC=5, the amygdala=5 and the insula=5) and an age-, race- and education- matched brain damaged comparison group (BDC=7, in order to demonstrate that the findings are due to the lesions in the hypothesized region and not related to other brain regions). One BDC subject who could not complete the study protocol due to time constraints is excluded from the analyses, therefore the final BDC group consists of six people. The number of subjects enrolled in the lesion experiment is limited to the number of target patients that I had access from the Cognitive Neuroscience Patient Registry at the University of Iowa Hospitals and Clinics. This number, small by sociological standards, is typical within neurology for studying lesion patients. In the third experiment 15 (7 male, 8 female), adult subjects (different from the first study) underwent fMRI scanning. Based on previous studies (typically 10-16 subjects) the sample size of the fMRI experiment is large enough to detect brain regions activated in response to the experimental conditions (Harris and Fiske 2006; Hart et al. 2000; Phelps et al 2000; Richeson et al. 2003; Ronquillo et al. 2007).

The inclusion/exclusion criteria for brain damaged subjects are male and female subjects, older than 18 years, are eligible for this study provided that they have sustained cerebral infarction, cerebral hemorrhage, herpes simplex encephalitis, surgical ablations of the cerebrum, lobar atrophy, cerebral anoxia, or selected instances of cerebral contusion. Subjects were not be included in the study if they 1) were under 18 years of age, 2) have intellectual disabilities, advanced demential syndrome, severe psychiatric disease, or history of heavy alcohol or drug abuse, 3) have systemic disease that may affect the central nervous system (e.g., primary tumors with CNS involvement, severe

diabetes, systemic infections, metabolic diseases, demyelinating disease), or 4) have multiple, behaviorally confounding lesions.

The inclusion/exclusion criteria for all other subjects are Caucasian, male and female subjects who have no known neurological, psychiatric, or neuropsychological impairment, no history of drug or alcohol abuse, and are in good health (see Appendix A1 for detailed selection criteria). The subjects are screened for the selection criteria on the phone when recruiting. In addition to race, the subjects in all the studies are kept similar in terms of age, gender and socio-economic status for mainly two reasons. First, this relative homophily provides comparisons across different studies, and secondly this provides a stronger test of the theory since homogenous samples tend to diminish the chances of nonessential variables influencing the results (Lucas 2003; Lynch 1999).

Patients in the Iowa Cognitive Neuroscience Registry with lesions in the hypothesized regions are at least 30 years old and have an education level of 10^{th} grade or above. Therefore, screening questions for the other studies recruited adults above the age of 30, and who have finished at least 10^{th} grade. In addition to age and education, income levels of the participants were also screened to exclude people from the highest and the lowest socio-economic strata. The cut-off points for the income level are determined by using the 2009 US Census. Volunteers who fall within the bottom or the top 10th percentile of the annual household income distribution of the U.S. (the bottom 10th percentile: below $12,000, the top 10 percentile: above $140,000) were not included to the study.

While various independent factors like social class, education and income have an impact on racial prejudice (Case, Greely, and Fuchs 1989; Maykovich 1975), these individual-level variables are often not as influential when compared to nation-level variables (Quillian 1995). Moreover, majority of white respondents still endorse biased responses net of other independent variables (e.g., Kluegel and Smith 1986; Jaynes and Williams 1989). Therefore, even though acknowledging the differences between whites

with different socio-economic backgrounds and excluding people from the highest and the lowest socio-economic strata, in the following chapters, this dissertation focuses on 'white Americans' as a unitary group.

Additional exclusion criteria were employed for participants who are recruited for the fMRI study (Study 3). As MRI relies on the use of a strong magnet, participants were excluded from this imaging portion if they have any of the following in their body: pacemaker, defibrillator, deep brain or nerve stimulator, bullets, shrapnel, metal slivers. Participants for this study were also excluded if they had any of the following conditions: anxiety attacks, panic disorder, claustrophobia, pregnant (or trying to become pregnant), breast feeding.

While the lesion subjects were recruited from the Iowa Cognitive Neuroscience Registry, all other subjects were recruited via flyers and recruitment ads posted in local restaurants, coffee shops, gas stations, local newspapers or other public places outside of Iowa City and Johnson County as well through the Cognitive Neuroscience Registry for Normative Data and via the online research database, researchmatch.org. The recruitment materials advertised the study as a general 'social cognition' or 'neurology' experiment. Experiments one and two (pictorial vignette and the lesion study) took place at the University of Iowa Hospital, Neurology Department. The third experiment (functional MRI) took place at the University of Iowa MR Research Facility. Participants of the pictorial vignette (Experiment #1) and the lesion study (Experiment #3) were paid $30, and the fMRI study (Experiment #2) participants were paid 40$ for compensation.[7]

Experimental Manipulation

In all experiments, participants were presented pictures of white and Black people in three different socio-economic positions as well as pictures of non-human stimuli (e.g.

[7] fMRI participants are paid slightly higher than the other participants because fMRI experiment is more cumbersome and takes longer.

objects, animals) to assess their emotional responses (see Table 4.1 for conditions and Appendix figures A.1 through A.4 for sample pictures).

Table 4-1 Experimental conditions

Low socio-econ.	Middle socio-econ.	High socio-econ.	Objects
Black	Black	Black	Pleasant
White	White	White	Unpleasant
e.g. homeless people, people with worn-out clothing	e.g. people barbecuing, having a picnic in good (but not very upscale) clothing	e.g. people wearing upscale clothing and jewelry, people in front of a sports car or a luxury yacht, professionals	e.g. spider, snarling dog, birthday cake, flowers

Note: There are 25 pictures per condition (e.g. 25 pictures of black middle SES people) in studies 1 and 2 (pictorial vignette and lesion) and 24 pictures per condition in the functional MRI study (in order to be able to equally distribute pictures across experimental blocks).

Participants were told that the purpose of the study is to investigate how the brain gives emotional responses to pictures of people vs. objects and non-human animals. Directly after the experimental task is completed, participants were debriefed about the complete purpose of the study and why omission of some information was necessary (see Appendix A-9 for debriefing statement). By not revealing the main purpose to the participants before the study, I was able to minimize the participant awareness bias. Participants who are aware of the purpose of the experiment are motivated to make sense of the experimental situation, to avoid negative evaluation from the experimenter and even to cooperate in a way intended to help the experimenter confirm the research hypothesis (Aronson, Wilson, and Brewer 1998). In order to assure deception is successful and the participants were not aware of the purpose of the study, experimental manipulation checks (derived from Forzano and Gravetter 2009, p. 211) were

implemented as an exit questionnaire to assess frustration with the experiment and the success of the deception (see Appendix A-8 for the exit questionnaire).

In all experiments, pictures were presented on a computer screen via E-prime. Functional MRI (Study 3) participants first viewed these pictures inside the MRI scanner (without reporting any emotions), and then underwent the following picture rating protocol. All participants were instructed that they will be viewing a series of images and answering some questions about them. These questions are about their first impressions of these pictures, so they should try to answer as fast as possible. After initial instructions, they completed a practice trial to make sure they understood the study procedures. During the experimental task, each picture appeared on the screen for 2 seconds; then, while the picture was still on the screen, eight emotion labels (happy, pride, sad, pity, angry, disgust, envy and fear) appeared on the screen in a random order for each picture; participants were asked to indicate whether they feel that emotion or not by pressing "YES" or "NO". For the emotions that the participants said "YES", they were asked to indicate to what extent they were feeling that emotion on a Likert scale ranging from '1' (very low) to '5' (extreme). Pictures were randomized for each subject. A green fixation cross on a black background was presented in between each picture. This method measured both reaction times (how fast they pressed "YES" or "NO" for each emotion) and the ratings for the intensity of the emotions. This method provided both an implicit measure (reaction times) and a relatively more explicit measure (ratings of the emotions) of the respondents' emotional reactions. Measuring reaction time for evaluative associations while the respondent is primed with a name or picture (indicating race, class or another social category) is one of the most widely used techniques to assess implicit bias (see Greenwald et al. 1998, 2003).

This picture rating procedure took approximately one hour to complete. The protocols pertaining to each experiment are described in more detail in the following chapters.

Construction of the Picture Data Set

The pictures for the project are chosen from the International Affective Picture System (IAPS) (Lang et al. 1995) and the World Wide Web (WWW). The International Affective Picture System (IAPS) is a qualified picture data set for researchers who are investigating emotions because it provides emotional valence and arousal ratings of the pictures and all the pictures are standardized in terms of quality and size. The IAPS is especially a good source for pictures of non-human stimuli such as animals, objects or landscapes. Therefore, pictures of all non-human stimuli are chosen from the IAPS in two categories (pleasant and unpleasant) according to their valence ratings. However IAPS dataset is limited in the number of pictures that might apply for the assessment of more specific moral and social emotions such as: pride, envy, disgust, and pity. Moreover, it does not include a sufficient number of pictures of people from diverse racial backgrounds (majority of the pictures are those of Caucasians) and some of the pictures are out of date (people with hair and clothing styles of 1970s, or 80s). Therefore, even though I used the pictures from the IAPS that fit into the study –especially since it is a standardized and repeatedly used picture data set- are used, I also used World Wide Web to find many other pictures, guided by the principles of the IAPS picture set.

With a team of two undergraduate students and a graduate student from the Neuroscience Department, I gradually constructed the picture set over the course of a year. We employed an iterative process of selecting potential pictures and then categorizing all the pictures according to socio-economic status and race and rejecting the ones that does not seem representative of categories and/or have lower image quality. We repeated this selection process several times to find twenty-five pictures per condition.

The picture selection process offered many unexpected complications as the Internet reflected various social biases. For example, it was challenging to find pictures of blacks in high SES and whites in low SES positions. Moreover, it was not possible to find very many pictures of women in either high or low SES positions, while it was

relatively easy to gather pictures of women in middle SES positions such as shopping in grocery stores, or in family pictures. There were also not very many pictures of elderly engaged in daily activities on the Internet. Therefore, the final picture set is not nationally representative of different genders or age groups (pictures show almost exclusively middle-aged or young adults). However, the likely confounding effects of these complications are reduced to a minimum by thoroughly matching the pictures across racial categories as described below. The pictures reflect a poorer gender match across socioeconomic groups. For example, there are disproportionately more women in middle SES category than low or high. Nonetheless, these differences diminish rather than aggravate confounding factors on the results as the pictures reflect social stereotypes for each SES category (e.g., women are less likely to be high SES professionals and more likely to be wives or mothers), and therefore make the conditions more accurately representative of the societal biases under study.

The pictures across racial categories within each SES group (e.g. black middle SES vs. white middle SES) are matched in terms of qualitative (such as the scenery, pose, posture) as well as quantitative aspects (such as number of people, eye-gaze) of the picture content. For example, a picture depicting a black family of four posing with their family dog was matched with an equivalent picture of a white family of four with posing with their family dog. Or, the picture of a white grandfather hugging his two grandchildren is matched with a black grandfather hugging his two grandchildren. As Table 4.2 below indicates, the pictures across racial categories (within each socioeconomic status group) represent an excellent match on various aspects including average number of people or the number of people with direct eye gaze (a factor that has been found to be associated with race-related amygdala activation by previous research, Richeson et al. 2008). Additionally, all pictures are rated on visual complexity (details and intricacy in the pictures) by thirty-seven volunteers (in a split design where each

volunteer rated about seventy-five pictures. Results indicate picture categories are not significantly different from each other on visual complexity.

Table 4-2 Comparison of the details in pictures across race and socioeconomic status categories

Per picture		Per picture category[1]				
	Average number of people	Number of men	Number of children	Number of people with direct eye gaze	Number of smiling people	Visual Complexity[2]
Low SES:						
Black	1	23 (% 89)	1 (% 4)	8 (% 31)	1 (% 4)	1.9 (0.7)
White	1	20 (% 77)	0 (% 0)	7 (% 27)	0 (% 0)	1.7 (0.5)
Middle SES:						
Black	3	40 (% 54)	31 (% 42)	41 (% 55)	66 (% 89)	1.7 (0.5)
White	3	34 (% 47)	28 (% 38)	38 (% 53)	65 (% 89)	1.7 (0.7)
High SES:						
Black	1	24 (% 71)	0 (% 0)	15 (% 44)	24 (% 71)	1.7 (0.7)
White	1	24 (% 71)	0 (% 0)	16 (% 47)	25 (% 74)	1.7 (0.7)

Note 1: Numbers in parentheses indicate the percentage per category. For example, for black low SES category, 89 per cent of the total number of people in pictures is men.

Note 2: Numbers in parentheses indicate standard deviations.

The final picture pool included 150 pictures of Caucasians and African Americans in various low, middle and high socio-economic positions and 50 pictures of objects/animals (25 pleasant and 25 unpleasant). These pictures are the stimuli that were used in all 3 experiments to elicit emotions to test my theory of moral boundaries.

Questionnaires

In addition to the experimental manipulation described above, subjects were also provided with several questionnaires to include as control variables and/or provide comparisons between different subject groups in analyses (see Appendix A-2 through A-8). Previous studies demonstrate that explicit racial bias (Wittenbrink et al. 2001; Ito et al. 2004) as well as participants' prior contact (acquaintance) with blacks (Ito et al. 2004) has an impact on participants' implicit racial attitudes. Therefore, in all experiments I collected explicit bias by using the Symbolic Racism scale (Sears and Henry 2002) and participants' prior contact with blacks (Racial Contact Questionnaire derived from Ito et al. 2004). In all studies, I also measured respondents' knowledge of racial stereotypes as a way to take into account their cultural exposure to biased racialized messages.

Additionally, as the participants' emotional mood and baseline affective tendencies would likely influence their emotional responses to the pictures (e.g. those who are higher in negative affect/mood than the population averages might be more likely to react with negative emotions to all pictures), all subjects were also administered the PANAS—the Positive and Negative Affect Schedule (Watson, Clark, and Tellegen 1988). Previous research shows that PANAS is a good predictor of anxiety and depressive disorders; moreover, it is little affected by demographic characteristics such as age or sex and the mean scores are very similar across different healthy samples (Crawford and Henry 2004; Watson, Clark, and Tellegen 1988; Watson and Clark 1999).

Other measures include basic demographic information (gender, race/ethnicity, education level, age and social class) and a Handedness Form (to determine which hand the subjects' dominantly uses as it pertains to lateralization of cognitive functions). In order to avoid revealing the purpose of the study, all explicit racial bias and the racial contact questionnaire were given after the picture-rating task. More information on the coding and results pertaining to these variables are explained in the appropriate chapters.

CHAPTER 5: BEHAVIORAL STUDY

While the social and psychological sciences advocate the notion that contemporary race bias is sustained and perpetuated through moral conventions and that emotions constitute important mechanisms in these processes, they fail to elucidate the exact mechanisms through which this happens. Yet, without understanding how these emotional mechanisms operate, it is not possible to explain how seemingly positive evaluations might sustain a racially inequitable status-quo. I propose apathetic racism theory, which argues that contemporary race bias relies on moral apathy and distinguishes between two different types of race bias that depend on distinct fast and automatic, emotional-motivational systems: a) sympathetic gradationalism –race bias within the class in-group (middle class) containing high approach-low avoidance moral emotions, and b) blended racism –race bias within the out-group (lower and upper classes) based on high avoidance or low approach-low avoidance moral emotions.

As a first step in testing apathetic racism theory, I conducted a computer experiment with adult participants where they reported their emotional evaluations of contextualizes photos of black and white people from lower, middle and upper social classes. In this chapter, I present results from this experiment, which specifically tested the following hypotheses:

Hypothesis #1: Participants will report feeling more intense *high approach-low avoidance moral emotions* (pride) towards middle class whites vs. blacks.

Hypothesis #2: Participants will report feeling more intense *high avoidance* (e.g., envy, disgust) or *low approach-low avoidance moral emotions* (e.g., pity) towards lower and upper class whites vs. blacks.

Hypothesis #3: Attribution of the moral-emotions (hypothesized in H#1) to whites will occur faster than that of blacks.

Methods

Design and Overview

An eight factor (White Lower Class, White Middle Class, White Upper Class, Black Lower Class, Black Middle Class, Black Upper Class, Non-human Pleasant and Non-human Unpleasant) fully crossed factorial design was used. Participants were presented pictures of white and black people in three different socio-economic positions as well as pictures of non-human stimuli (e.g. objects, animals) to assess their emotion responses (see Harris and Fiske 2006 for a similar design). In addition to this picture rating task, participants' baseline affective states (the Positive and Negative Affect Schedule, PANAS), explicit racial attitudes (Stereotype Assessment Scale, Symbolic Racism Scale, Racial Contact Questionnaire) and demographic characteristics were collected. Manipulation checks were implemented as an exit questionnaire.

Participants

Thirty-one Caucasian adult volunteers participated in the experiment. One subject[8] who indicated he was not naïve to the study hypotheses after the completion of the experiment is excluded from the analyses. The final data set consists of thirty subjects (12 men 18 women). See Chapter 4 (Overall Methodology) for more on recruitment strategy.

Materials

Picture Rating: Pictures of white and black people in three different socio-economic positions as well as pictures of non-human stimuli (e.g. objects, animals) were used to assess subjects' emotion responses. A total of 200 pictures (25 per factor) were employed. The pictures for the project are chosen from the International Affective Picture

[8] The participant indicated that he had searched for the experimenter's name on the World Wide Web and found out about the purpose of the experiment before coming to the experiment.

System (IAPS) (Lang et al. 1995) and the World Wide Web (WWW). See Chapter Four for more on picture set construction and evaluation.

Each picture was evaluated on eight emotions (happy, pride, sad, pity, angry, disgust, envy and fear), first as whether or not feeling that emotion ("yes" coded as 1, "no" coded as 0), and then if the answer is yes, to what extent each emotion is felt (ranging from 1 "very low" to 5 "extreme"). This way, for each emotion two different outcome variables are obtained: First, a dichotomous variable (1/0) for whether or not the respondent is feeling the emotion. And second, a more nuanced emotion rating variable by merging the dichotomous yes/no variable with the ordinal intensity one. In this new variable, those who responded as "no" to the first variable were coded as zero and for those who responded as "yes", their emotion intensity (1 through 5) responses were used. The second variable ranges from "0" to "5". Additionally, reaction times (how fast they pressed "yes" or "no" for each emotion) were collected for each picture.

PANAS. The 20-item Positive and Negative Affect Schedule (PANAS), includes two mood scales, one measuring positive affect and the other measuring negative affect. Each item is rated on a 5-point scale ranging from 1 ("very slightly or not at all") to 5 ("extremely") to indicate the extent to which the respondent has felt this way at the time they were answering ("right now", "at the present moment"). The scale is used to construct two measures by adding up 10 items for each mood (negative and positive). Each affect scale ranges from 10 to 50 (Watson, Clark, and Tellegen 1988; Watson and Clark 1994). Higher values indicate higher affect.

Stereotype Assessment Scale. Stereotype Assessment indicates the number of stereotypes each respondent reported to know about blacks from a list of 24 stereotypes (lazy, ignorant, low in intelligence, poor, stupid, unreliable, aggressive, rude, loud, hostile, uneducated, sexually perverse, criminal, rhythmic, musical, athletic, intelligent, kind, sportsmanlike, straightforward, sensitive, artistic, loyal to family, honest) (Devine and Elliot 1995). Respondents are instructed to select those adjectives that they know to

be part of the cultural stereotype whether or not they believe the stereotype to be true. If the respondent reported to know of that stereotype, it is coded as "1" if not "0". The final measure is an additive scale ranging from "0" to "24"; higher values indicate more knowledge of stereotypes.

Racial Contact Questionnaire. Racial contact is assessed by first asking respondents to list all of their black acquaintances and then rate each acquaintance in terms of how well he or she was known on a 7-point scale ranging from "1, know/ knew as only an acquaintance" to "7, know/knew very well" (Ito et al. 2004). Contact score is a cumulative index that sums the level of contact with the black acquaintances per respondent. Higher values indicate more contact.

Symbolic Racism: This scale consists of a series of statements relating to race and politics to which the participant must state their agreement (Henry and Sears 2002, Sears and Henry 2005). First, each item is coded so that the response indicated higher values. Then, to compensate for the differences in the number of response options (some are on a scale of four some three), each item is coded on a 0 to 1 scale, so items with three response options are recoded as 1 = 0, 2 = .50, and 3 = 1, and the other items are recoded as 1 = 0, 2 = .33, 3 = .66, and 4 = 1 (see Henry and Sears 2002 for this coding strategy). The final measure is an average score across eight items (ranging from 0 to 1). Higher values reflect more racial animosity.

Demographics. Age is in years at time of testing. Education is education in years of formal schooling. Gender is coded one if male, zero if female.

Exit Questionnaire. This is a questionnaire implemented as manipulation checks (derived from Forzano and Gravetter 2009, p. 211) to assess frustration with the experiment and the success of the deception. The questions included: 1. "Did you enjoy participating in this experiment?" 2. "How long did the experiment seem to take?" 3. "Were you bored?" 4. "What did you think was the purpose of the experiment?" 5. "Did you suspect that you were being deceived?"

Procedure

After completing informed consent, participants were given verbal instructions. Participants were told that the purpose of the study is to investigate how the brain gives emotion responses to pictures of people vs. objects and non-human animals.[9] Before starting the task on the computer, each participant completed the PANAS. For the picture-rating task, all participants were given both verbal and written instructions (on a computer screen). All participants were told that they would be viewing a series of images and answering some questions about them. These questions are about their first impressions of these pictures, so they should try to answer as quickly as possible. After initial instructions, they completed a practice trial to make sure they understood the study procedures. Pictures were presented on a computer screen E-prime. Each picture was centered on a black background and took up seventy-five percent of the screen (resolution 1024x768). The responses were collected using an Ergodex DX-1 Input System with labeled buttons (see Figure 5.1). The position of the "YES" and "NO" buttons are switched for about half of the respondents.

During the experimental task, each picture appeared on the screen for 2 seconds; then, while the picture was still on the screen, eight emotion labels (happy, pride, sad, pity, angry, disgust, envy and fear) appeared on the screen in a random order for each picture; participants were asked to indicate whether they feel that emotion or not by pressing "YES" or "NO". For the emotions that the participants said "YES", they were asked to indicate to what extent they were feeling that emotion on a Likert scale ranging from '1' (very low) to '5' (extreme). Pictures were randomized for each subject and emotion labels were randomized for each picture. A green fixation cross on a black background was presented in between each picture. Participants were given three breaks

[9] Directly after the experimental task is completed, participants were debriefed about the complete purpose of the study and why omission of some information was necessary.

(indicated with a green break screen, which continued the task as the respondent pressed "Continue"). After the completion of the picture rating task, the participants were instructed to complete additional, previously described questionnaires (on paper).

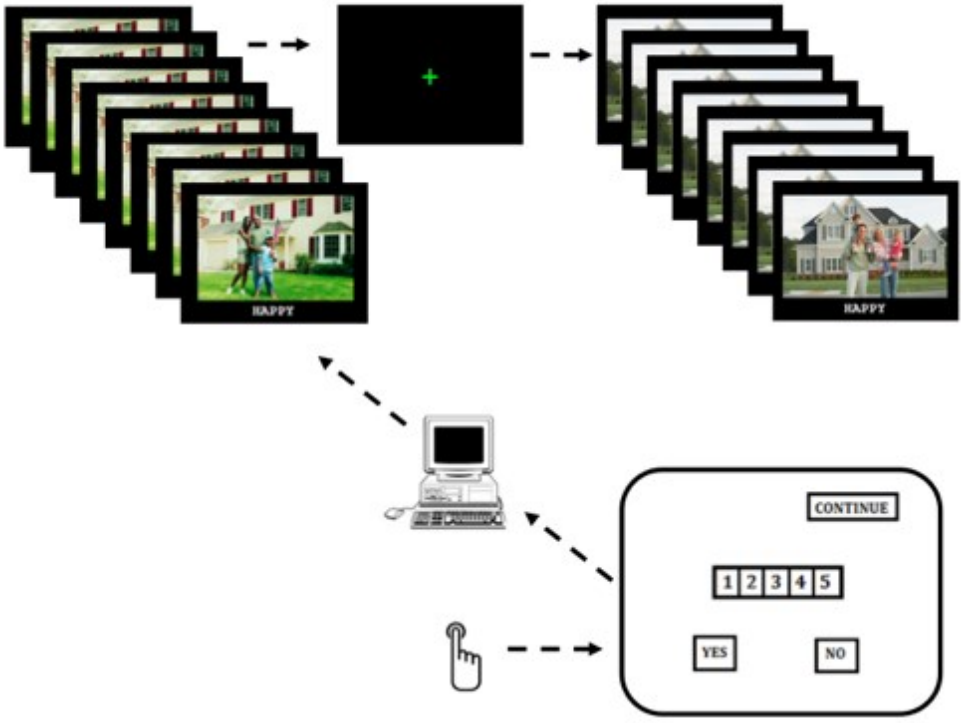

Figure 5.1 Experimental procedure.

Analytic Strategy

The data were analyzed by fitting multilevel mixed-effects regression models. Mixed-effects regression takes into account the correlated error structure of the repeated variables. Three outcome variables were investigated: a) categorical emotion variables, b) emotion intensity and c) reaction times.

Categorical emotion variables are the respondents' initial answer ("yes" or "no") to the emotions after viewing each picture. These variables are analyzed with two-level

random effects logistic regression models where subject identifiers are entered as random intercepts (Stata's xtlogit command). *Emotion intensity* variables are continuous variables that were constructed by combining the 'yes/no' categorical emotion variables with the intensity of the emotion (respondents' answer to "what degree" they felt each emotion, rages from '1' to '5'). Eight final emotion intensity variables were created; they range from 0 "none" to 5 "extreme". *Reaction time* variables denote to how fast the respondents pressed "yes" or "no" for each of the eight categorical emotion variables. In order to eliminate responses that might be given inattentively (i.e. too fast or too slow), reaction times larger than two standard deviations were replaced with the mean and smaller than 150ms were replaced with '150ms' (previous research shows at least 100ms is required to have a genuine physiological response, Luce 1986)[10]. Additionally, to normalize the distribution of this variable, a logarithmic transformation was applied before entering into the regression (see Greenwald et al. 1998, or Whelan 2008 for similar strategies).

Both emotional intensity and reaction times were analyzed with three-level level random effects regression models and restricted maximum likelihood estimator (REML) (Stata's xtmixed command). REML estimator is often recommended for analyses with small samples (if the higher order group size is 30 or smaller) (Kreft 1996; Raudenbush and Bryk 2002). The mixed-effects regression models were constructed in three steps. First, subject identifiers were entered as random intercepts. The likelihood ratio tests reported by Stata revealed that entering subjects as random intercept models have significantly improved the models. Second, to assess the best fitting model, a model with one random intercept (subjects are entered as random intercepts) (Model 1), a model with two random intercepts (subjects and conditions nested in subjects were random intercepts) (Model 2) and a model with random intercept and slopes (subjects are the random intercepts and conditions nested in subjects were the random slopes) (Model 3)

[10] Analyses were also conducted without this imputation, the differences are negligible.

were tested against each other with likelihood ratio tests. Results reveal that while model 1 and 2 were significantly different from each other for all emotions, model 2 and 3 were not; therefore model 2 (two random intercepts) is adapted (see Table A-10 in Appendix for likelihood ratio comparisons).

Third, residual diagnostics were carried out; and skewness and kurtosis issues were revealed from the predicted errors of the regression models of the emotion intensity but not reaction time variables (see Table A-11, Appendix). Thus, Stata's cluster bootstrapping (subjects are used as clusters from which the samples are derived) method with one thousand bootstrap replications was used during estimation of the emotional intensity models. Because the bootstrapping method does not rely on distributional assumptions (such as normal distribution, skewness, kurtosis), it can provide more accurate inferences of variances, standard errors and confidence intervals when such assumptions are violated (Hox 1998).

Five different models were carried out for all outcome variables. The first model is a variance component model with no fixed effects, the second one includes the conditions as fixed effects (categorical factor variables, '1' = Black Lower Class, '2' = Black Middle Class, '3' = Black Upper Class, '4' = White Lower Class, '5' = White Middle Class, '6' = White Upper Class, '7' = Non-human Pleasant, '8' = Non-human Unpleasant, first category is the reference group), the third model includes the basic demographic and mood characteristics (age, gender, education, positive and negative PANAS scores) in addition to the conditions as fixed effects, the fourth model includes explicit racial measures (Symbolic Racism, racial contact, stereotype assessment) as fixed effects in addition to the effects of the conditions, and the last model includes all fixed effects.[11],[12]

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[11] All continuous variables are centered around their means.

[12] Additional analyses were conducted entering social class as dummy variables. The effects of class were negligible; therefore, social class is not included in the models reported here.

In addition to these models, I further investigated the emotional report differences across race and class conditions with a series of follow-up contrasts (using Stata's lincom command) after the third mixed-effects regression model controlling for age, education, gender, positive and negative affect. Below, results from these models and contrasts are summarized.

Results

Demographic and Descriptive Characteristics

All respondents are adults (average age=53.73, 18 women, 12 men) and on average they have some college education (average education=15.23). The respondents' positive and negative affective schedule scores are well within the normal thresholds of affect (Watson and Clark 1999). As also can be seen on Table 5.1 below, the average racial contact score is 12.23, stereotype assessment score is 11.37 and symbolic racism score is 0.40.

Table 5-1 Demographic and descriptive characteristics

Variable	Mean	Std.	Min	Max	N
Age	53.73	15.07	30	79	30
Gender	18 female, 12 male	-	-	-	30
Education	15.23	2.43	12	21	30
Class	1 Lower, 13 Working, 15 Middle	-	-	-	29
Positive Affect	31.93	6.09	20	42	30
Negative Affect	11.70	1.90	10	17	30
Contact	12.23	12.58	0	55	30
Stereotype Assessment	11.37	4.68	2	21	30
Symbolic Racism	0.40	0.19	0.09	0.90	29

Turning to their reports on the outcome measures, we see that the most frequently reported emotions for pictures of blacks and whites in each socioeconomic position group are the same. For pictures of both black and white people, the highest rated emotions for the lower class conditions are sadness and pity, the middle class people are happiness and pride and upper class people are happiness and envy (see Table A-12 of Appendix). Moreover, the emotional intensities across racial conditions are also very similar. Considering the intensity scales range from zero to five, overall the intensities of the emotions are not very high with the highest reported intensity being 2.57 (happiness for pleasant pictures of non-humans). The emotions that are the most frequently reported are also rated the highest in terms of their intensities. Again looking at this table, we can also see that these highest rated emotions took also the longest to report.

Race and Class Contrasts

The findings fail to support hypothesis one; there is no significant difference in the feeling of pride toward middle class blacks and whites. The second hypothesis is supported; participants reported heightened moral emotions of envy, disgust and pity for out-group whites vs. blacks. The third hypothesis is not supported; there are no significant race differences in reaction times. The results from all the models are reported in Appendix tables A-13 through A-24. Results of post-estimation contrasts assessing the hypotheses are summarized below.

Low Approach-High Avoidance: Fear and Disgust

The only significant racial difference in the dichotomous fear report is in the upper class picture categories. The log odds of feeling fearful while viewing pictures of upper class white people are significantly higher than those of upper class blacks ($p < 0.05$). No significant race differences were revealed in the emotion intensity or the reaction time models. Collapsing race conditions across class categories and contrasting

the averaged effects of class conditions revealed several differences. The log odds of feeling fearful are significantly higher for lower classes compared to upper and middle ($p < 0.01$), and upper classes compared to middle class conditions ($p < 0.01$).

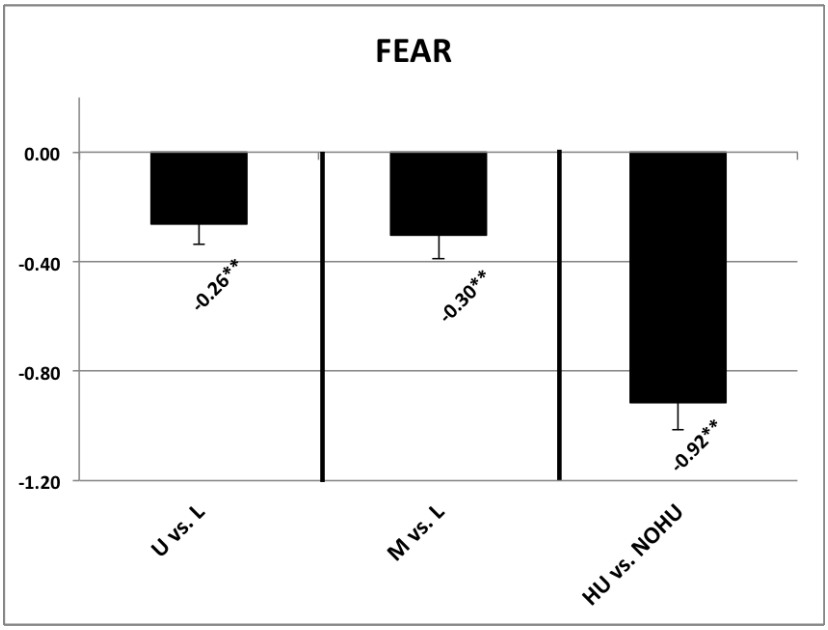

Figure 5.2 Significant coefficient contrasts for the intensity of fear. U=Upper class, L= Lower class, M=Middle class, HU= Human, NOHU=Non-human. **p < 0.01. Error bars indicate standard errors. U vs. L= Negative values indicate stronger fear for lower vs. upper class conditions. M vs. L= Negative values indicate stronger fear for lower vs. middle class conditions. HU vs. NOHU= Negative values indicate stronger fear for non-human vs. human conditions.

Similarly, for the emotion intensity ratings, respondents rated feeling more fearful while viewing pictures of lower classes vs. upper and middle class ($p < 0.01$). To put these comparisons in perspective, I also collapsed all the conditions with pictures of humans and non-humans and compared their averaged coefficients. Results show that the participants reported feeling more intense fear while viewing pictures of non-humans (like animals) vs. humans ($p < 0.01$). Interestingly, this difference in the feeling of fear while viewing pictures of humans and non-humans resemble that of lower class and other

class conditions (see Figure 5.2). Reaction time models revealed that reporting whether or not one felt fear while viewing pictures of lower class people took significantly longer than those of upper and middle class ($p < 0.01$).

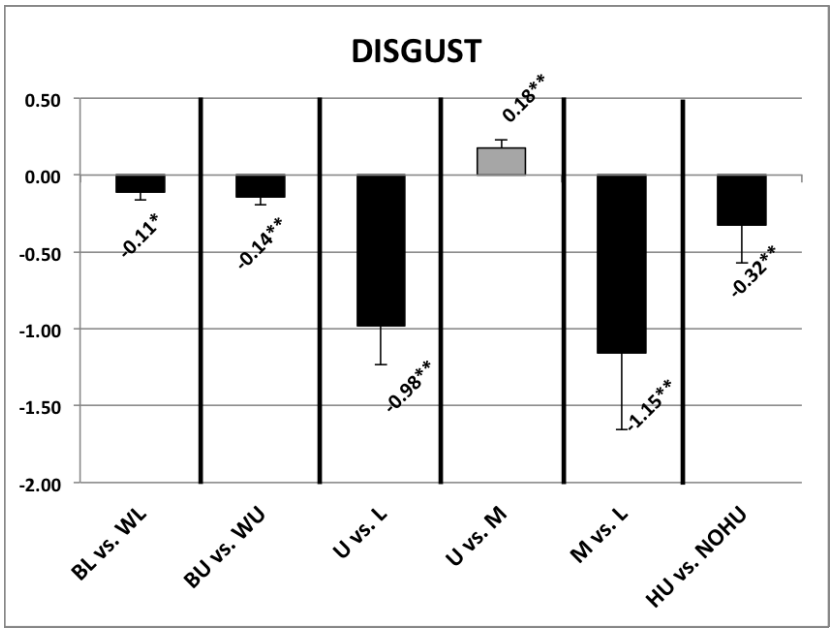

Figure 5.3 Significant coefficient contrasts for the intensity of disgust. U=Upper class, L= Lower class, M=Middle class, HU= Human, NOHU=Non-human. **p < 0.01, *p < 0.05. Error bars indicate standard errors. BL vs. WL= Negative values indicate stronger disgust for white vs. black lower class conditions. BU vs. WU= Negative values indicate stronger disgust for white vs. black upper class conditions. U vs. L= Negative values indicate stronger disgust for lower vs. upper class conditions. U vs. M= Positive values indicate stronger disgust for upper vs. middle class conditions. M vs. L= Negative values indicate stronger disgust for lower vs. middle class conditions. HU vs. NOHU= Negative values indicate stronger disgust for non-human vs. human conditions.

When we look at the emotion of disgust, we see some differences in the race contrasts. Overall, in line with the blended racism argument, the respondents felt more disgust when looking at pictures of whites compared to blacks. For example, the log odds of feeling disgust were significantly higher for the white middle and upper conditions than black middle and upper ($p < 0.01$). Respondents also reported feeling more intense

disgust towards pictures of white lower and upper class people vs. black lower and upper ($p < 0.05$ for lower class comparisons and $p < 0.01$ for upper class). There were no reaction time differences across race conditions. Collapsed across race conditions, class comparisons for both categorical emotion and emotion intensity models reveal increased disgust in response to pictures of lower classes (vs. middle and upper class photos), and pictures of upper vs. middle class people ($p < 0.01$ for all contrasts). As can be seen in Figure 5.3, the differences in the intensity of feeling disgust between lower and other class conditions is larger than that of the difference between overall human vs. non-human picture conditions. Reaction time models revealed that reporting disgust for lower class condition took significantly longer than those of upper and middle class conditions ($p < 0.01$).

High Approach-High Avoidance: Anger and Envy

Looking at the emotions that are high in both approach and avoidance, we see that the log odds of feeling angry while viewing pictures of white lower and upper class are significantly higher than those of black lower and upper class people ($p < 0.05$ for lower and $p < 0.01$ for upper class conditions). The intensity of feeling anger is only significantly different in the lower class conditions where the participants reported feeling significantly higher anger for white vs. black lower class members ($p < 0.05$) (see Figure 5.4). There are no significant race differences in reaction times. In both categorical emotion and emotion intensity variables, the respondents rated the feeling of anger higher for pictures of lower vs. middle and upper class ($p < 0.01$ for all contrasts), and pictures of upper vs. middle class people ($p < 0.01$ for all logistic regression contrasts and $p < 0.05$ for emotion intensity contrasts). It also took the respondents longer to report whether or not they felt angry when looking at pictures of lower class people vs. the other two classes ($p < 0.01$).

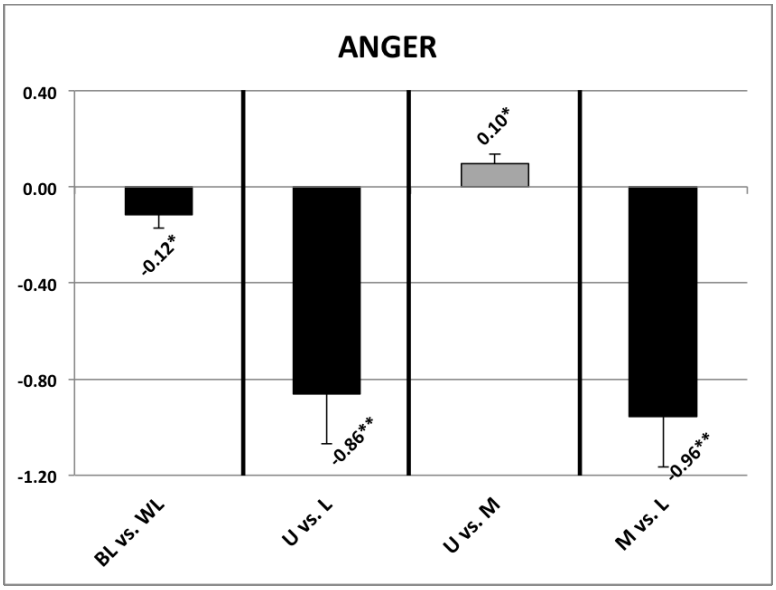

Figure 5.4 Significant coefficient contrasts for the intensity of anger. U=Upper class, L= Lower class, M=Middle class, HU= Human, NOHU=Non-human. **p < 0.01, *p < 0.05. Error bars indicate standard errors. BL vs. WL= Negative values indicate stronger anger for white vs. black lower class conditions. U vs. L= Negative values indicate stronger anger for lower vs. upper class conditions. U vs. M= Positive values indicate stronger anger for upper vs. middle class conditions. M vs. L= Negative values indicate stronger anger for lower vs. middle class conditions.

For both categorical and intensity variables, results reveal increased envy in response to pictures of white middle and upper class in comparison to black middle and upper class people ($p < 0.05$ for middle class and $p < 0.01$ for upper class comparisons). There were no significant racial differences in reaction time. For the class comparisons, in both categorical emotion and emotion intensity models, the averaged coefficients for lower class people were significantly smaller than those of middle and upper class conditions ($p < 0.01$). As can be seen in Figure 5.5, differences between the class conditions are larger than the overall difference between the pictures of humans and non-humans. Results of the reaction time model indicate that the respondents took longer to report whether or not they felt envy in upper and middle class conditions than lower ($p < 0.01$).

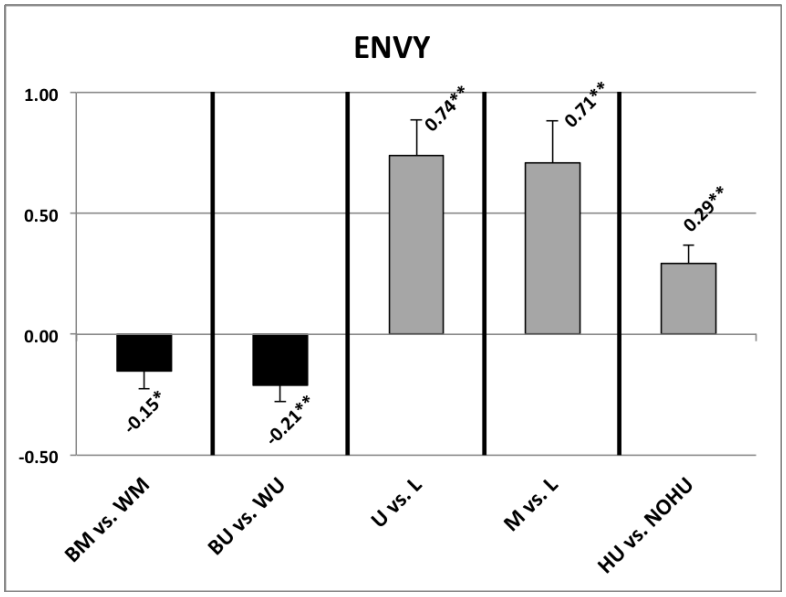

Figure 5.5 Significant coefficient contrasts for the intensity of envy. U=Upper class, L= Lower class, M=Middle class, HU= Human, NOHU=Non-human. **p < 0.01, *p < 0.05. Error bars indicate standard errors. BM vs. WM= Negative values indicate stronger envy for white vs. black middle class conditions. BU vs. WU= Negative values indicate stronger envy for white vs. black upper class conditions. U vs. L= Negative values indicate stronger envy for lower vs. upper class conditions. M vs. L= Negative values indicate stronger envy for lower vs. middle class conditions. HU vs. NOHU= Negative values indicate stronger envy for non-human vs. human conditions.

High Approach-Low Avoidance: Happy and Pride

Results of both categorical emotion and emotion intensity variables indicate increased happiness for pictures of black vs. white out-group class conditions ($p < 0.05$ for emotion intensity lower class contrasts, $p < 0.01$ for the rest) (see Figure 5.6). There were no reaction time differences between black and white conditions. Both categorical emotion and emotion intensity models also revealed greater happiness while viewing pictures of middle vs. upper and lower class, and upper vs. lower class people ($p < 0.01$ for all). It took the respondents longer to rate whether or not they felt happy while viewing pictures of upper and middle vs. lower class conditions ($p < 0.01$); but there were

no significant differences between the reaction times of upper and middle class conditions.

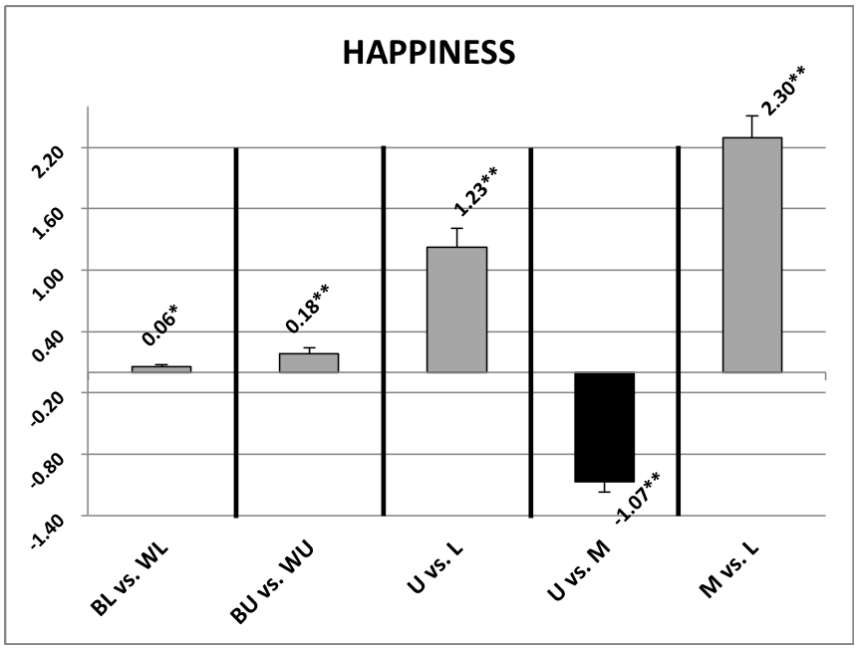

Figure 5.6 Significant coefficient contrasts for the intensity of happy. U=Upper class, L= Lower class, M=Middle class, HU= Human, NOHU=Non-human. **p < 0.01, *p < 0.05. Error bars indicate standard errors. BL vs. WL= Negative values indicate stronger happy for white vs. black lower class conditions. BU vs. WU= Negative values indicate stronger happy for white vs. black upper class conditions. U vs. L= Negative values indicate stronger happy for lower vs. upper class conditions. U vs. M= Positive values indicate stronger happy for upper vs. middle class conditions. M vs. L= Negative values indicate stronger happy for lower vs. middle class conditions.

The only significant racial difference in the emotion of pride was revealed in the categorical emotion model, where the log odds of feeling proud was higher for pictures of black lower vs. white lower class people ($p < 0.01$). There were no race differences in reaction times. In both categorical emotion and emotion intensity models, the participants showed increased pride for middle vs. upper and lower class, and upper vs. lower class conditions ($p < 0.01$ for all). As seen on Figure 5.7, similar to the differences in envy, the

class differences in feeling proud is higher than the overall difference between human and non-human conditions. Reaction time models indicated longer reaction times for upper vs. lower ($p < 0.01$), and middle vs. upper ($p < 0.05$) and lower class conditions ($p < 0.01$).

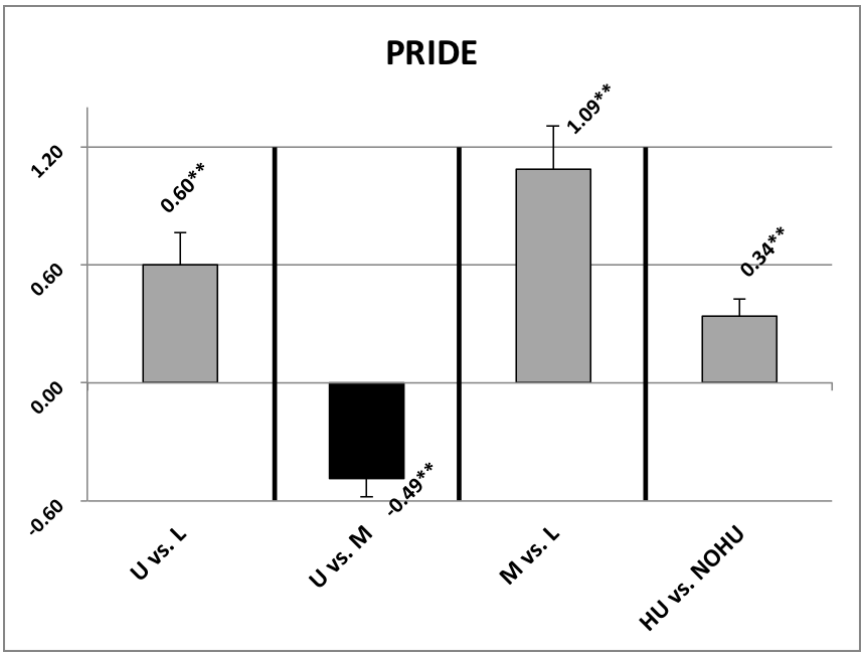

Figure 5.7 Significant coefficient contrasts for the intensity of pride. U=Upper class, L= Lower class, M=Middle class, HU= Human, NOHU=Non-human. **p < 0.01, *p < 0.05. Error bars indicate standard errors. U vs. L= Negative values indicate stronger pride for lower vs. upper class conditions. U vs. M= Positive values indicate stronger pride for upper vs. middle class conditions. M vs. L= Negative values indicate stronger pride for lower vs. middle class conditions. HU vs. NOHU= Negative values indicate stronger pride for non-human vs. human conditions.

Low Approach-Low Avoidance: Sadness and Pity

Across both race and class differences in sadness, the categorical emotion and emotion intensity variables reveal the same significances. In both models, there is increased sadness in response to pictures of upper class whites vs. upper class blacks ($p <$

0.01) (see Figure 5.8). That is the only racial difference in this category, with no race differences observed in reaction times. Looking at the differences between class conditions averaged across race categories, we see elevated sadness while viewing pictures of lower vs. upper and middle class people as well as upper vs. middle class people ($p < 0.05$ for the emotion intensity contrast between upper and middle class, $p < 0.01$ for the rest). The respondents took longer to report whether or not they felt sad while viewing pictures of lower class people vs. upper and middle ($p < 0.01$).

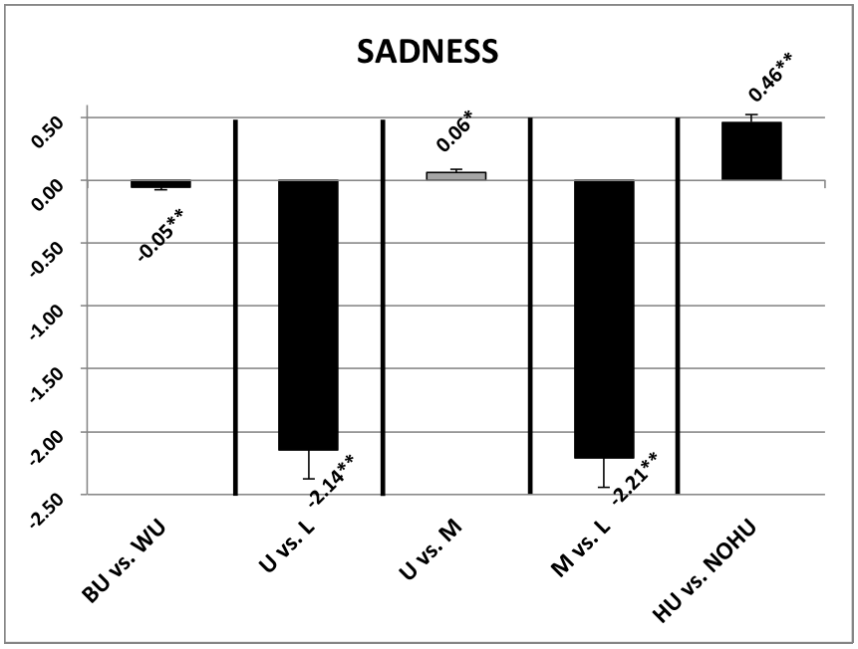

Figure 5.8 Significant coefficient contrasts for the intensity of sadness. U=Upper class, L= Lower class, M=Middle class, HU= Human, NOHU=Non-human. **$p < 0.01$, *$p < 0.05$. Error bars indicate standard errors. BU vs. WU= Negative values indicate stronger sadness for white vs. black upper class conditions. U vs. L= Negative values indicate stronger sadness for lower vs. upper class conditions. U vs. M= Positive values indicate stronger sadness for upper vs. middle class conditions. M vs. L= Negative values indicate stronger sadness for lower vs. middle class conditions. HU vs. NOHU= Negative values indicate stronger sadness for non-human vs. human conditions.

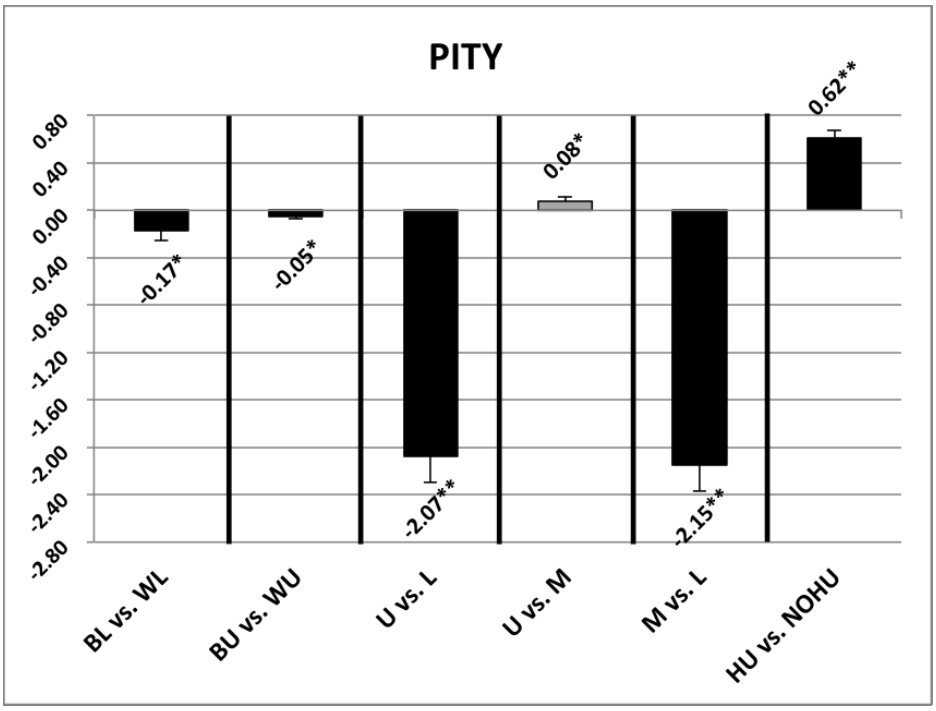

Figure 5.9 Significant coefficient contrasts for the intensity of pity. U=Upper class, L= Lower class, M=Middle class, HU= Human, NOHU=Non-human. **p < 0.01, *p < 0.05. Error bars indicate standard errors. BL vs. WL= Negative values indicate stronger pity for white vs. black lower class conditions. BU vs. WU= Negative values indicate stronger pity for white vs. black upper class conditions. U vs. L= Negative values indicate stronger pity for lower vs. upper class conditions. U vs. M= Positive values indicate stronger pity for upper vs. middle class conditions. M vs. L= Negative values indicate stronger pity for lower vs. middle class conditions. HU vs. NOHU= Negative values indicate stronger pity for non-human vs. human conditions.

For pity, while categorical emotion model revealed no race differences, the emotion intensity model showed that the respondents indicated higher levels of pity in response to pictures of white lower and upper vs. black lower and upper class people ($p < 0.05$). For class contrasts, both categorical emotion and emotional intensity models revealed heightened pity in response to lower vs. middle and upper as well as upper vs. middle class conditions ($p < 0.05$ for the emotion intensity contrast between upper and middle class, $p < 0.01$ for the rest) (see Figure 5.9). Reaction time model showed that it

took longer to report whether or not one felt pity for pictures of lower vs. upper and middle class people ($p < 0.01$).

Effects of Other Explanatory Variables on Emotions

Age had a positive impact on the log odds of feeling happy and a negative impact on the log odds of feeling envy ($p < 0.05$ for Model 3, $p < 0.01$ for Model 5, Table A-16 in Appendix). Age had no impact on the intensity of any of the emotions. Age had a significant positive effect on the reaction times of the emotions fear ($p < 0.05$, only Model 5), pity ($p < 0.05$, only Model 5), sadness ($p < 0.05$, Models 3 ad 5), happiness ($p < 0.01$, Models 3 ad 5) and pride ($p < 0.05$, Models 3 ad 5). Men had significantly lower log odds of anger ($p < 0.05$ for Model 3, $p < 0.01$ for Model 5), fear ($p < 0.01$, Models 3 ad 5), sadness ($p < 0.01$, Models 3 ad 5) and pity ($p < 0.01$, Models 3 ad 5) than women. They also gave less intense ratings for fear ($p < 0.05$, only Model 3), sadness ($p < 0.05$, only Model 5) and pity ($p < 0.01$ for Model 3, $p < 0.05$ for Model 5) than women. Additionally, men had significantly lower (faster) reaction times than women for sadness ($p < 0.05$, only Model 3) and happiness ($p < 0.05$, Models 3 ad 5). Education had no impact on the log odds or the reaction times of the emotions. The only significant impact it had was negative and on the intensity of feeling pride ($p < 0.05$, only Model 3) and this effect also disappeared once controlled for racial measures.

Positive affect at the time of the experiment had a significant positive influence on the log odds of fear ($p < 0.05$, Models 3 ad 5), sadness ($p < 0.05$, only Model 3), envy ($p < 0.05$ for Model 3, $p < 0.01$ for Model 5) and pride ($p < 0.05$, only Model 3). It did not have any significant effects on the intensity or the reaction times of the emotions. Negative affect had a significant negative impact on the log odds of happiness ($p < 0.05$ for Model 3, $p < 0.01$ for Model 5) and pride ($p < 0.05$, Models 3 ad 5). It also negatively influenced the intensity of pride ($p < 0.05$, Models 3 ad 5). Similar to positive affect, it had no significant influence on the reaction times.

Symbolic racism had a significant effect on the log odds of happiness and pity only after controlling for the demographic characteristics (Model 5). This effect was positive for happiness ($p < 0.05$) and negative for pity ($p < 0.05$). Symbolic racism also had a significant positive impact on the intensity of happiness ($p < 0.05$, Models 4 and 5). Symbolic racism had no significant impact on reaction times. Racial contact had a significant negative impact on the log odds of anger ($p < 0.05$, Models 4 and 5) and disgust ($p < 0.05$, Model 4 only). As the number of the black contacts (friends, acquaintances) increase the log odds of anger and disgust decreases. Racial contact had no significant effects on the intensity or the reaction times of the emotions. Finally, participants' knowledge of the cultural stereotypes had a significant positive influence on the log odds of sadness ($p < 0.05$, Model 4), but this effect disappeared once controlling for demographic variables. This variable had no significant impact on emotion intensity or reaction times.

Discussion

The results from this experiment provide partial support for apathetic racism theory and also reveal some unexpected findings. First, the sympathetic gradationalism hypothesis is not supported; there is no difference in the feelings of pride or happiness towards middle class blacks and whites. Second, blended racism hypothesis is supported; increased moral emotions of envy, disgust and pity were reported towards out-group whites vs. blacks. And finally and unexpectedly, emotional differences in judging social class groups were more persistent and intense than those across racial groups. Perceived differences between different class members were even larger than the differences between humans and non-humans.

The findings provide no support for the sympathetic gradationalism hypothesis that the respondents will feel elevated pride for pictures of white vs. black middle class people. In fact, there were fewer differences between the emotions felt towards middle

class blacks and whites than upper and lower class groups. Three potential reasons might underlie these outcomes. First, it is possible that there is less racial discrimination against middle class blacks; the middle class identity clouds perception of racial differences observed in other class groups. However, this view does not fit with previous sociological research evidencing racial discrimination experienced by blacks that are middle class and professionals (e.g., Feagin and Sikes 1994; West 1994). A second explanation would be that participants were more reluctant to give away their feelings towards those in middle class groups because of the socially valued position of 'middle classness'. Finally, a third explanation would be that the race bias against middle class blacks is different from those in other class groups not (or not only) in the approach/avoidance dimensions but also in its embodiment. The biases against middle class blacks are potentially more automatic and non-conscious than this experimental design can capture. The functional imaging in Chapter 7 further contributes to this discussion by offering findings supportive of my theory using a more subtle technique.

The only significant differences between the emotions felt towards middle class black and whites were that disgust and envy were more likely in the white vs. black middle class conditions. While envy and disgust are both high on avoidance, envy is also high, while disgust is low, on approach. Although it seems counter to my predictions that emotions that are high on avoidance are associated with white vs. black middle class conditions, these findings are in line with the dehumanization and infra-racial humanization theories and the moral apathy assumption in my theory. Accordingly, newer forms of racism rely on moral exclusionary processes by which out-group members are dehumanized and less likely to be attributed moral emotions (e.g., Harris and Fiske 2006; Opotow 1990; Leyens et al. 2003). However, most research following these perspectives does not take into account the differences in the degree or type of moral exclusion within the out-group members. The motivational systems approach I

advocated entangles these differences by offering support that racial evaluations within the out-group are blended and rely on moral apathy as I explain next.

Findings supported the blended racism hypothesis; the participants reported feeling elevated envy, disgust and pity for upper and lower class whites vs. blacks. What these findings entail is that independent of the valence (positivity or negativity) of the emotions, high avoidance or low approach moral emotions are felt increasingly towards whites vs. blacks. Similar to the findings regarding race differences within the middle class conditions, these results also provide partial support for dehumanization theories. Moreover, moral-emotional race differences within the middle class conditions and the upper class conditions are very similar; envy and disgust are involved the same way in both. However, while a myriad of basic (e.g. anger, happiness) and moral emotions are involved in the differences between upper and lower class blacks and whites, only two moral emotions (disgust and envy) were associated with race differences within the middle class conditions. It seems like in terms of its emotional motivations, racial evaluation differences are more confined and specific for the middle class, while for other class groups these differences are more diffused and mixed. Although these results do not mark a clear motivational distinction between racial evaluations across class lines, they support blended racism argument.

The results failed to support the third hypothesis. No significant race differences in reaction times were revealed. Even for the emotions that revealed a race difference, there were no reaction time differences. Moreover, my results show that it took longer to respond to the emotions that the participants reported feeling more strongly. While the potential reason for the divergence between my findings and the previous literature might be due to social desirability issues, the analytical procedures I employed (looking at the results from only the first five pictures to see if they show a different pattern) make it unlikely. Therefore, I argue that these findings challenge the dominant view in the literature that contemporary racism relies on implicit (non-conscious) mechanisms that

are fast. Even though the methods utilized in this study are somewhat different than those used by previous research on implicit attitudes (e.g., Greenwald and Krieger 2006; Nosek et al. 2007; Schmidt and Nosek 2010), similar results should have been revealed if the same cognitive/emotional concept. The reason for this discrepancy in replicating reaction time differences might be because of a potential dissociation between automatic and emotional bias. Most of the current literature assumes that automatic bias is tied to implicit gut reactions and feelings; however, the emotional and motivational basis of automatic bias is still poorly understood. This study shows that reaction time differences are not related to the emotional differences in racial evaluations.

The main implication of this finding is that the current focus of the scholarship on racial bias should be extended beyond automatic evaluations. Contemporary mainstream literature first identifies a measurement effect (i.e. reaction time differences) and then creates definitions/explanations around this effect. I argue that there should be a shift in the scientific approach to first defining an overarching theoretical concept and then measuring it with different tools. This way, meaningful connections between automatic/implicit bias and other or subsuming psychological concepts/constructs like emotional evaluations and motivation systems can be revealed.

Finally, emotional differences in judging social class groups are more persistent and intense than those across racial groups. These differences reveal that the middle class group is the most favorable class category for a group of middle class participants, followed by upper and then lower class members. Moreover, the differences in emotional evaluations between class groups were even more intense than those between human and non-humans. For example, the respondents reported feeling more intense pride while viewing pictures of humans (collapsed across all conditions) vs. non-humans (unpleasant and pleasant conditions collapsed). Considering pride is a secondary, moral emotion, we would expect this. We would not expect respondents to report feeling pride while viewing pictures of dogs or landscapes. However, the coefficient difference between the

human and non-human conditions is smaller than the differences between class conditions; for this sample, there were more positive emotions toward non-humans than to members of different classes. The difference between the middle class and lower class conditions is more than three times larger than that between human and non-human conditions. These results suggest that class bias cannot be explained with dehumanization theories. Emotional differences toward different class groups were evident across emotions in all motivation dimensions. This shows class bias does not rely solely on moral apathy, nor it is confined to a certain motivation system; it is more blatant and perhaps severe than race bias, a provocative finding requiring more research.

CHAPTER 6: NEUROPSYCHOLOGICAL STUDY

Apathetic racism theory argues that the racial biases within one's social class in-group (middle class), referred to as sympathetic gradationalism, and out-group (lower and upper classes), referred to as blended racism, depend on distinct emotional-motivational systems, and are thus separable in the brain. While the ventromedial prefrontal cortex (VMPFC) is crucial for sympathetic gradationalism, or racial bias within the class in-group, by mustering moral emotions high in approach but low in avoidance (e.g. pride), the amygdala and the insula are the primary regions involved in blended racism, or race bias within the class out-groups, by employing moral emotions that are either high in avoidance (e.g., envy, disgust) or a mixture of low approach and low avoidance (e.g., pity).

To test these predictions, my dissertation utilized an experiment investigating emotional evaluations of pictures of black and white people from low, middle and upper social class conditions in patients with lesions of the VMPFC, amygdala, and insula. Exploring how the human brain would operate in the absence of these regions will provide insights into understanding whether or not race bias within the out-group and in-group classes trigger two different neurological processing systems: a) a more subtle, seemingly positive evaluative system involved with sympathetic gradationalism, and b) a more aversive and blatant system underlying blended racism.

In this chapter, I present results from this experiment, which specifically tested the following hypotheses:

Hypothesis #1: The emotional rating differences between middle class whites and blacks on the *high approach-low avoidance* moral emotions (pride) will be greater in the patients with damage to their VMPFC compared to adults with no damage or brain damaged comparison groups.

Hypothesis #2: The emotional rating differences between out-group class whites and blacks on the *high avoidance* (e.g., envy, disgust) or *low approach-low avoidance* (e.g., pity) moral emotions will be smaller in the patients with damage to their amygdala or the insula than adults with no damage or brain damaged comparison groups.

Methods

The design and the overview of this study are identical to the one described in Chapter 5. See Chapter 5 for details on design, materials and procedure.

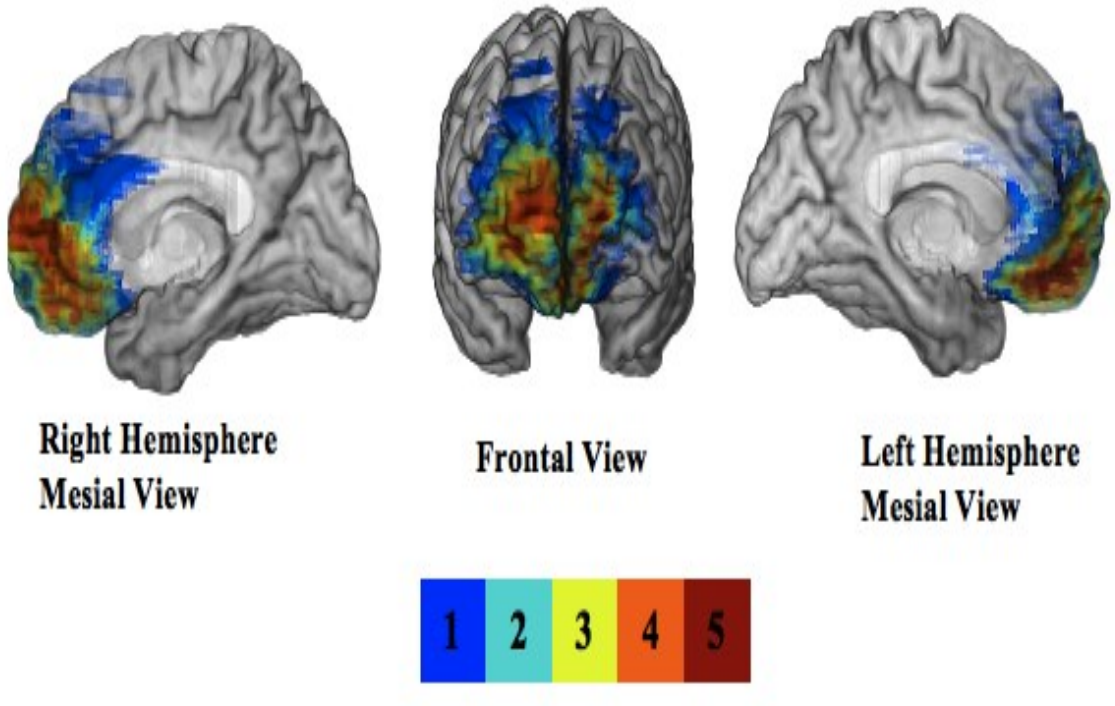

Figure 6.1 Lesion overlap of the VMPFC patients. Mesial and frontal views of the overlap map of lesions for the five VMPFC patients. The color bar indicates the number of overlapping lesions at each voxel. The area of maximal overlap lies in the VMPFC.

Participants

Twenty-two patients with late onset, focal brain damage (patients who had their lesions after the age of 18) were drawn from the Cognitive Neuroscience Patient Registry. These subjects include five patients with focal bilateral VMPFC lesions (see Figure 6.1), five patients with unilateral amygdala lesions (see Figure 6.2) five patients with unilateral insula lesions[13] as well as seven brain-damaged comparison (BDC) subjects. One BDC subject who could not finish all the study procedures in the designated time period is excluded from analyses; the final sample size for the BDC group is six. Additionally, fifteen age-, race- and education-matched, neurologically normal comparison (NC) subjects were selected from the first experiment (reported in Chapter 5) to provide a comparison group (see Chapter 4, Overall Methodology for further details on recruitment strategy and inclusion/exclusion criteria).

Lesion patients' neuropsychological and clinical data were obtained from the University of Iowa's Division of Behavioral Neurology and Cognitive Neuroscience (see Table 6.3). Overall, the patients have intact cognitive and executive functioning and general intelligence and were similar in demographic characteristics, explicit racial evaluations and the neuropsychological scales reported here[14] (see Tables 6.1 through 6.3). The VMPFC group has a significantly longer chronicity time than the Insula ($p < 0.01$) and BDC ($p < 0.05$) groups. The VMPFC group has significantly lower positive affect score than the amygdala group ($p < 0.05$). The insula group has significantly higher negative affect score than the VMPFC ($p < 0.05$), normal comparison ($p < 0.01$), and the brain damaged comparison groups ($p < 0.01$).

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[13] There is no MAP-3 data for the insula patients except one subject with right and one with left unilateral insula lesions. Therefore, no overlap maps for the insula patients are provided.

[14] Bonferroni comparisons reveal groups were not significantly different from each other on age or education, explicit racial evaluation scales (stereotype assessment, racial contact and symbolic racism) and the neuropsychological scales.

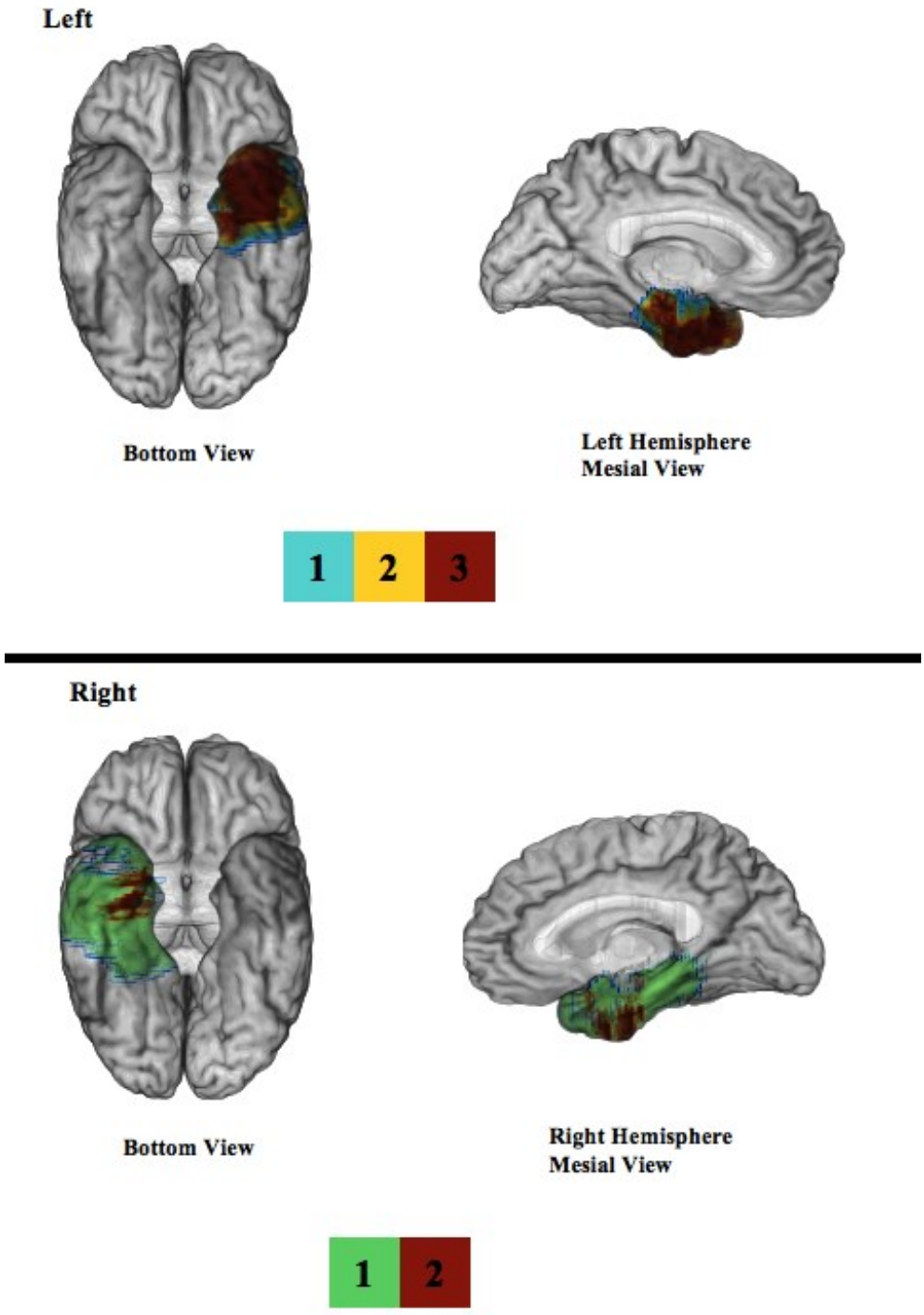

Figure 6.2 Lesion overlap of the amygdala patients. Bottom and left hemisphere mesial views for of the overlap map of lesions for the three left amygdala patients and bottom and right hemisphere mesial views of the overlap map of lesions for the two right amygdala patients are presented. The color bar indicates the number of overlapping lesions at each voxel.

Table 6-1 Demographic and clinical data

Patient	Sex	Age	Education	Class	Handedness	Chronicity	PANAS *Positive*	PANAS *Negative*	Etiology
VMPFC (bilateral):									
318	M	72	14	W	R	37	28	10	Meningioma resection
770	F	70	16	M	R	27	32	11	Meningioma resection
1983	F	49	13	W	R	17	32	10	SAH
2391	F	67	14	M	R	13	15	17	Meningioma resection
2577	M	71	12	W	R	14	29	10	SAH; ACoA aneurysm
Amygdala:									
2403 (left)	F	54	12	M	R	14	39	11	Temporal lobe resection
2492 (left)	F	42	12	M	L	12	39	11	Temporal lobe resection
2555 (left)	F	42	12	W	R	12	28	12	Temporal lobe resection
1465 (right)	M	82	14	M	R	22	45	17	Herpes Simplex Encephalitis
2962 (right)	M	56	14	W	L	10	43	10	Temporal lobe resection
Insula:									
3341 (left)	F	71	13	W	R	7	31	13	Ischemic stroke, left MCA
3367 (left)	M	66	17	M	R	6	34	23	Ischemic stroke, left MCA
3476 (left)	F	67	16	M	R	5	38	17	*IPH*
3543 (left)	M	70	13	W	R	3	39	15	Ischemic stroke, left insular
3196 (right)	F	63	12	M	R	7	34	15	Ischemic stroke, right MCA CVA
VMPFC	2M, 3F	66 (9.6)	14 (1.5)	3M, 2W	5R	21.6 (10.2)	27.2 (7.1)	11.6 (3.05)	
Amygdala	3F, 2M	55.2 (16.3)	13 (1.1)	3M, 2W	3R, 1M, 1L	14 (4.7)	38.8 (6.6)	12.2 (2.8)	
Insula	3M, 2F	67.4 (3.2)	14 (2.2)	3M, 2W	5R	5.6 (1.7)	35.2 (3.3)	16.6 (3.8)	
BDC	4M, 2F	64 (8.8)	16.5 (3.2)	5M, 1L	5R, 1L	9.8 (1.9)	33.2 (5.4)	10.5 (0.8)	
NC	7M, 8F	63 (9.9)	14.7 (1.9)	9M, 6W	14R, 1L	-	33.3 (5.4)	11.3 (1.8)	

Note: Group mean and SD values are reported in parenthesis. Age is in years at time of testing. Education is education in years of formal schooling. Class is self-reported social class (W=working class, M=middle class). Handedness reports dominant hand (R=right, M=Mixed, L=left). Chronicity is the time between lesion onset and completion of the present experiment, in years. Etiology describes the cause of neurological lesion (MCA CVA=Cerebrovascular Accident of Middle Cerebral Artery, IPH=*Intraparenchymal hemorrhage)*. BDC patients had brain damage due to surgical intervention (n = 2) or cerebrovascular disease (n = 4).

Table 6-2 Racial attitudes

Patient	Racial Contact	Stereotype Assessment	Symbolic Racism
VMPFC (bilateral):			
318	15	12	0.4
770	0	6	0.4
1983	11	12	0.6
2391	43	10	0.3
2577	0	18	0.7
Amygdala:			
2403 (left)	28	16	0.4
2492 (left)	44	8	0.4
2555 (left)	2	13	0.5
1465 (right)	12	8	0.2
2962 (right)	9	11	0.5
Insula:			
3341 (left)	5	4	0.3
3367 (left)	0	11	0.5
3476 (left)	0	14	0.1
3543 (left)	14	17	0.4
3196 (right)	0	8	0.3
VMPFC	13.8 (17.6)	11.6 (4.3)	0.5 (0.2)
Amygdala	19 (16.9)	11.2 (3.4)	0.4 (0.1)
Insula	3.8 (6.1)	10.8 (5.1)	0.3 (0.1)
BDC	18.7 (17.1)	12.1 (2.7)	0.3 (0.2)
NC	15.7 (15.1)	11.7 (4.3)	0.4 (0.2)

Table 6-3 Neuropsychological data

	WAIS-III			WMS-III				
	VIQ	PIQ	FSIQ	GMI	WMI	TT	STROOP	BDI
VMPFC (bilateral):								
318	142	134	143	109	124	44	61	0
770	119	94	108		118	44	58	6
1983	110	105	108	74	105	44	41	5
2391	110	107	109	132	102	43	47	4
2577	89	80	84	96	88	44	39	7
Amygdala:								
2403 (left)	105	102	104	88	146	44	62	4
2492 (left)	84	127	101	93	124	43	48	3
2555 (left)	85	90	87	91	85	44	63	6
1465 (right)	102	121	110	79	118	43	47	8
2962 (right)	107	106	107	104	91	44	52	3
Insula:								
3341 (left)	96	109	102	130	105	44	65	1
3367 (left)		94				21		
3476 (left)	93	90	91	100	79	39	52	8
3543 (left)				101	85	40	36	5
3196 (right)	100	111	105	120	93	42	48	0
VMPFC	114 (19.1)	104 (19.9)	110 (21.1)	102 (24.3)	107 (14.1)	44 (0.5)	49 (9.9)	4 (2.7)
Amygdala	97 (11.2)	109 (14.9)	102 (8.9)	91 (9.0)	113 (25.0)	44 (0.6)	54 (7.6)	5 (2.2)
Insula	96 (3.5)	101 (10.6)	99 (7.4)	113 (14.7)	91 (11.2)	37 (9.3)	50 (11.9)	4 (3.7)
BDC	108 (20.8)	106 (16.9)	108 (20.6)	115 (14.2)	101 (19.1)	42.3 (2.3)	46 (10.2)	6 (6.1)

Note: WAIS-III, Wechsler Adult Intelligence Scale-III scores (VIQ, verbal IQ; PIQ, performance IQ; FSIQ, full-scale IQ). WMS-III, Wechsler Memory Scale-III scores (GMI, general memory index; WMI, working memory index). For all five indices, 80–89 is low average, 90–109 is average, 110–119 is high average, 120+ is superior). TT, Token Test (from the Multilingual Aphasia Examination), a measure of basic verbal comprehension. Stroop, *T*-score on the Interference trial of the Stroop Color-Word Test, a measure of response inhibition (Stroop 1935). BDI, Beck Depression Inventory, a measure of baseline mood (raw scores reported. According to the BDI-II manual, "Nondepressed" individuals had mean BDI-II scores of 7.7 (SD 5.9), whereas "mildly depressed," "moderately depressed," and "severely depressed" individuals had mean BDI-II scores of 19.1 (SD 5.7), 27.4 (SD 10.0), and 33.0 (SD 12.0), respectively (Beck, Steer, and Brown 1996).

Analytical Approach

I employed two analytical strategies to analyze the data. First, Fisher's exact tests (Fisher 1922, 1954) were used to compare the proportions of reporting 'yes' for feeling each emotion per condition within and between lesion types (the dichotomous 'yes/no' variable is the outcome). Second, mixed-effects regressions with two random intercepts and restricted maximum likelihood estimator (REML) were conducted with Stata's xtmixed command. Mixed-effects regression takes into account the correlated error structure of the repeated variables. REML estimator is often recommended for analyses with small samples (if the higher order group size is 30 or smaller) (Kreft 1996; Raudenbush and Bryk 2002). The outcome variables in these models are the continuous emotional response variable ranging from '0' to '5', '0' indicating not feeling the emotion and '5' indicating extreme intensity. Analyses were conducted using Stata, versions 11 and 12.

The mixed-effects regression model was composed in five stages. First, subject identifiers were entered as random intercepts. The likelihood ratio tests revealed that entering subjects as random intercept models significantly improved the models. Second, three different models testing the effects of conditions (categorical factor variables, '1'= Black Lower Class, '2'=Black Middle Class, '3'=Black Upper Class, '4'=White Lower Class, '5'=White Middle Class, '6'=White Upper Class, '7'=Non-human Pleasant, '8'=Non-human Unpleasant, first category is the reference group) nested in subjects as fixed (model 1), random intercept (model 2) and random slope (model 3) were entered and these models were tested against each other with likelihood ratio tests. Results reveal that while model 1 and 2 were significantly different from each other for all emotions, model 2 and 3 were not; therefore model 2 (random intercept for conditions) is adapted. Third, models comparing the normal and the BDC comparison groups were conducted (excluding other lesion patients) to assess whether or not these groups were significantly different from each other in their emotional reactions. In these models, dummy variables

(coded as 1 if lesion type=BDC) for the BDC and BDC-condition interaction were entered. The results revealed no significant differences between the BDC and normal groups on their reports of any of the emotions. Therefore, in order to increase power and ease of interpretation, BDC and normal groups were entered as a combined category into final analyses.

Fourth, two different models per emotion outcome entering the effects of the lesion (categorical factor variable, '1'= BDC/Normal, '2'=VMPFC, '3'=Amygdala, '4'=Insula) as fixed vs. random were carried out. Entering lesion types as random intercepts had no significant improvements on the model; therefore, lesions are included as fixed effects in the models. The final models were mixed-effects regressions with two random intercepts (subjects and conditions nested in subjects). Finally, residual diagnostics were carried out; and skewness and kurtosis issues were revealed from the predicted errors of the regression models (see Table A-25, Appendix). Thus, Stata's cluster bootstrapping (subjects are used as clusters from which the samples are derived) method was used during estimation. Two thousand and one thousand bootstrap replications were performed for full and reduced models, respectively. Because the bootstrapping method does not rely on distributional assumptions (such as normal distribution, skewness, kurtosis), it can provide more accurate inferences of variances, standard errors and confidence intervals when such assumptions are violated (Hox 1998).

In sum, in addition to the Fisher's exact tests, my final models consist of two different bootstrapped mixed-effects regression models for each emotion outcome with random intercepts. The first models were reduced models where only lesion types were entered as dummy variables controlling for age, gender and education to see if the lesions had any general impact on the emotions. The second model models were the full models that regressed each emotion outcome on the conditions, the lesions and the lesion-condition interactions controlling for age, gender and education.

Results

Reduced and Full-Model Mixed-Effects Regression

None of the lesion patients were significantly different from the normal/BDC on eight emotions in the reduced models (see Table A-26 Appendix). For the full models, the main effects of conditions were statistically significant at the level of .01 (with the exception of 'envy' where this main effect is only marginally significant, $p = 0.063$), while the main effects of lesions were not significant for all emotion outcomes (see Table A-27 Appendix). The combined effects of lesion-condition interactions are statistically significant for all emotions ($p < 0.01$) suggesting the effects of lesions are specific to certain types of stimuli rather than the emotional rating in general. The results from the full models are reported in Table A-28 in Appendix. I conducted several post hoc contrasts to identify the differential effects of lesions on emotional evaluations with respect to different race and class groups. Below I summarize these results as well as the results of Fisher's exact tests.

Comparison Groups

First, looking at the proportions of reporting 'yes' for feeling each emotion, we see that the most frequently reported emotions for pictures of blacks and whites in each socioeconomic position group are the same. For pictures of both black and white people, the highest rated emotions for the poor people are sadness and pity, and the middle class and rich people are happiness and pride (see Table A-29 Appendix). However, conducting Fisher's exact tests comparing racial groups revealed some significant differences between these proportions.

Results of Fisher's exact test revealed that normal/BDC respondents reported feeling pity and sadness significantly more frequently for white lower compared to black lower class conditions ($p < 0.02$, two-tailed). Interestingly, respondents also reported feeling happiness more frequently for the pictures of black lower compared to white

lower people ($p < 0.05$, two-tailed). The only difference between racial groups within the middle class condition is the reports of envy. Normal and BDC subjects reported feeling envy more often for white middle vs. black middle class conditions ($p < 0.05$, two-tailed). Normal/BDC respondents also indicated feeling anger ($p < 0.05$, one-tailed), envy ($p < 0.01$, two-tailed) more frequently and happiness ($p < 0.05$, two-tailed) less frequently for white upper vs. black upper class conditions. The results of the mixed-effects regression were very similar to those of the Fisher's exact tests. The same significant differences in the same direction were revealed (see Table A-29 Appendix). The only divergences were that there were no significant differences for the reports of feeling happiness and there was a significant difference in the report of feeling disgust between black and white lower class conditions. Normal/BDC subjects reported feeling more intense disgust towards pictures of white compared to black lower class people ($p < 0.01$). No significant race differences were revealed in feeling fear or pride.

In summary, results from normal and brain damaged comparison groups represent a mixture of pro-black and pro-white feelings. Of the significant emotional differences across all class conditions, feeling moral emotions (pity, envy and disgust) were reported more towards whites compared to blacks. Additionally, emotional differences between racial groups were observed more frequently in lower and upper class conditions compared to the middle. While normal/BDC respondents reported more empathic and moral emotions like envy and pity towards white upper and lower class conditions vs. black, they also reported feeling more aversive and basic emotions such as anger and disgust towards whites in these conditions. Accordingly, for the in-group class condition (middle) racial evaluations differed only in moral emotions (envy), while for the out-group class conditions (upper and lower) a mixture of moral and basic emotions were involved.

VMPFC

First, when we look at the emotional response differences towards racial groups within the VMPFC group, results of the Fisher's exact tests reveal that, similar to the normal/BDC group, the VMPFC patients reported feeling pity significantly more frequently for white lower vs. black lower class conditions ($p < 0.05$, two-tailed) and feeling envy more often for white vs. black middle class ($p < 0.05$, two-tailed). In contrast to the comparison group, however, the VMPFC patients also reported feeling happiness and pride more frequently for the picture of white vs. black middle class conditions (both $p < 0.05$, one-tailed). In the normal/BDC group, these differences were not only insignificant but also in the opposite direction (more happiness and pride for black middle vs. white middle) (see Figure 6.3). For the mixed-effects regression, interestingly, only significant emotional difference between racial groups for the VMPFC group was the greater report of disgust for white upper vs. black upper class conditions ($p < 0.05$). While this result is unexpected, it might be due to the VMPFC's more general role in moral emotional regulation.

I further investigated the differences between emotional reports of the normal/BDC and the VMPFC group with a series of follow-up contrasts after the mixed-effects regression. The results of these contrasts revealed that the only significant difference between the ratings of the VMPFC and comparison group across conditions was the feeling of fear in the white lower class condition in which the VMPFC group reported feeling less fear than the normal/BDC. Yet, these effects were small and did not lead to any significant difference between normal and VMPFC patients' relative ratings of white lower vs. black lower class conditions. There were no other significant differences between VMPFC and the comparison groups' emotional ratings of the conditions per se (including unpleasant and pleasant pictures of non-human entities).

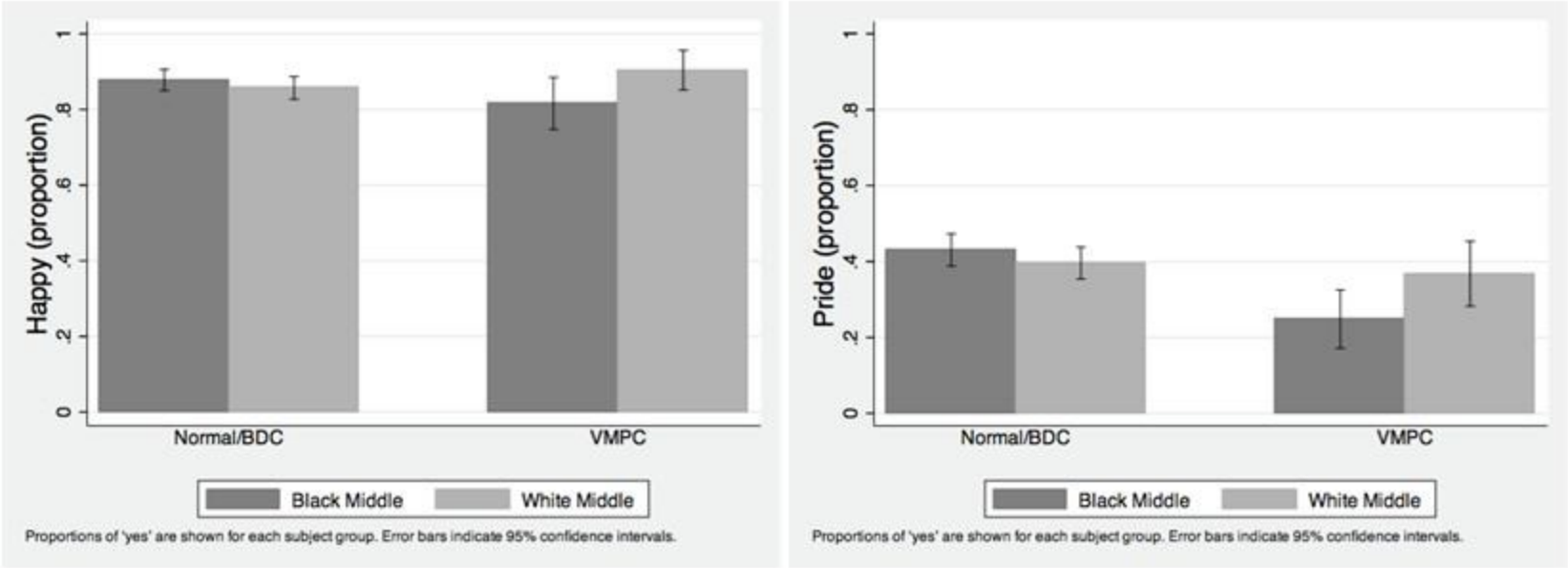

Figure 6.3 The proportions of happiness and pride towards the middle class reported by the VMPFC and the comparisons. The VMPFC patients reported feeling happiness and pride more frequently for the pictures of white vs. black middle class conditions (both $p < 0.05$, one-tailed). In the normal/BDC group, these differences were not statistically significant.

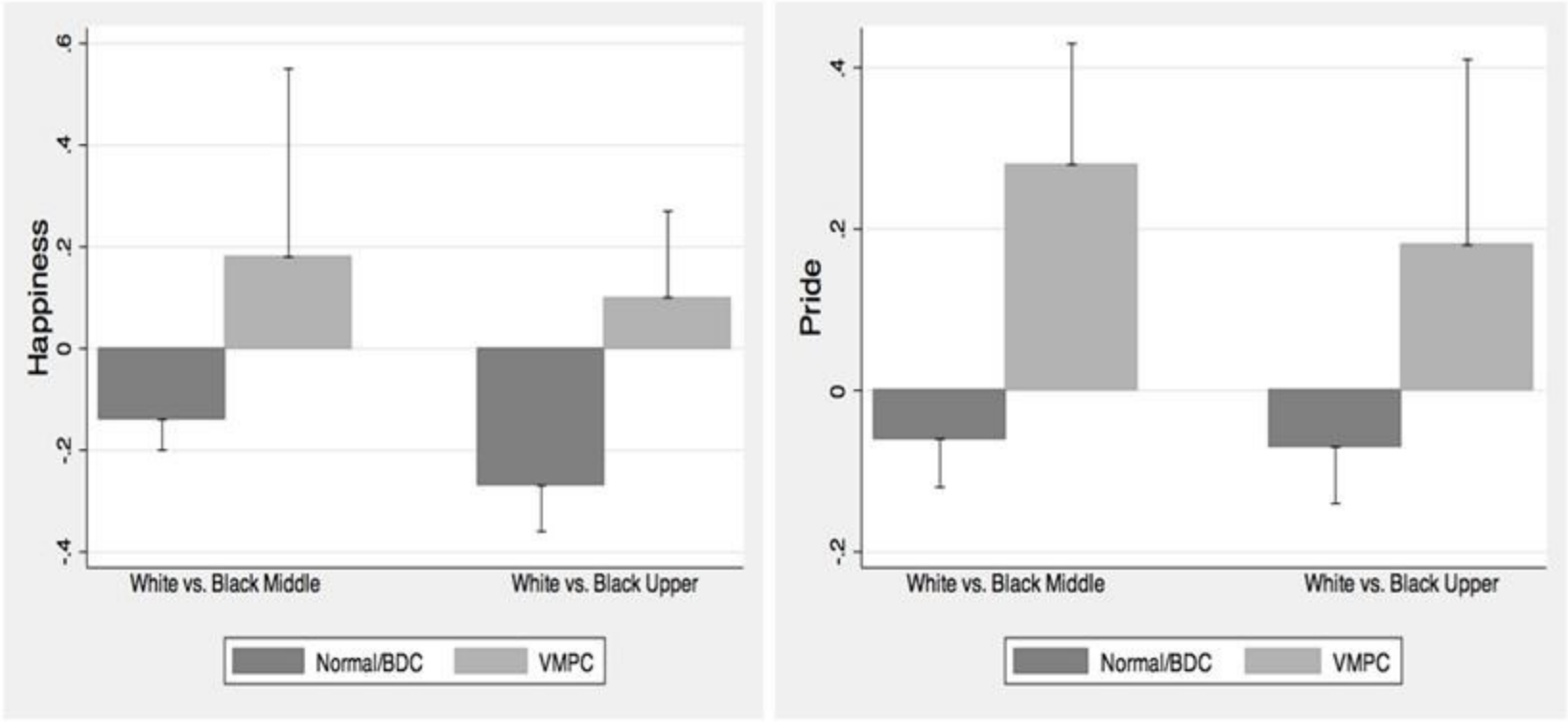

Figure 6.4 Coefficient differences between white vs. black (middle and upper class) conditions within the VMPFC and the comparisons for the emotions of happiness and pride. Negative values indicate stronger emotion for black vs. white race conditions. Error bars indicate standard errors. Only the differences in happiness for the upper class and pride for middle class conditions are statistically significant ($p < 0.05$).

There were two significant differences between the relative ratings (black vs. white) of the VMPFC and the normal/BDC. These differences were in the ratings of high approach/low avoidance emotions happiness and pride for upper class and middle class conditions, respectively (see Figure 6.4). First, the difference between feeling happiness for the white upper and black upper class conditions was in the opposite direction (more happiness for the whites vs. blacks) in the VMPFC compared to the normal/BDC group ($p < 0.05$). Second, the difference between ratings of pride for the white middle and black middle class conditions was in the opposite direction (more pride for whites vs. blacks) in the VMPFC compared to the normal/BDC group ($p < 0.05$). These findings provide partial support for my first hypothesis regarding the role of the VMPFC in moral emotions in the high approach/low avoidance quadrant for the middle class group. However, they also indicate that the VMPFC has a more general role in emotional evaluations.

Amygdala

In contrast to my predictions, we see that the amygdala damage is affecting a broader spectrum of emotions including high-approach and low-avoidance emotions like pride. However, amygdala damage led to a confined range of emotional racial bias (preferring one racial group over another) triggered by out-group class conditions (lower and upper) in partial support of the blended racism argument and hypothesis 2.

Fisher's exact tests comparing emotional ratings of blacks and whites within each class condition revealed no significant differences for the amygdala patients. For the mixed-effects regression model, the only significant difference was for the feeling disgust in the lower class condition in which the amygdala patients reported feeling significantly more disgust for the pictures of black vs. white lower class people ($p < 0.01$). This difference is in contrast to that of the normal/BDC group where more disgust was reported for the black compared to white lower class conditions ($p < 0.01$).

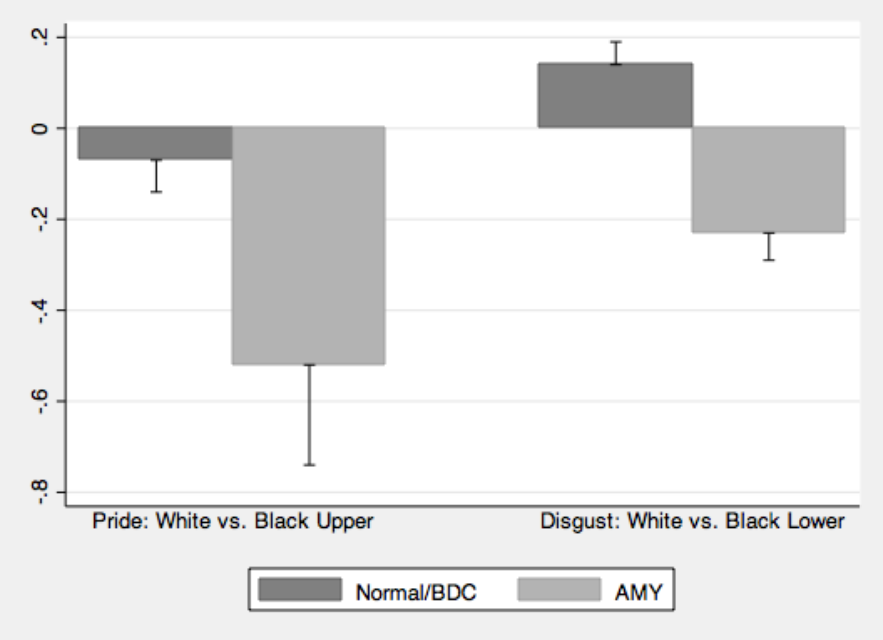

Figure 6.5 Coefficient differences between white vs. black (upper and lower class) conditions within the amygdala and the comparisons for the emotions of pride and disgust. Negative values indicate stronger emotion for black vs. white race conditions. Error bars indicate standard errors.

Further investigations with post-hoc contrasts after the mixed-effects regression show some significant differences between the amygdala and the normal/BDC group. First patients with the amygdala lesion responded with greater pride for the black middle and black upper conditions and happiness for black and white middle and upper class conditions ($p < 0.05$ for all) than the comparison group. When we look at the relative race condition differences, there are no significant differences between the relative emotional evaluations of the amygdala and the comparison group for the middle class condition. The relative racial evaluations of the amygdala and the normal/BDC subjects differ only in disgust ($p < 0.05$) and pride emotions (marginally significant, $p < 0.055$), for lower and upper class conditions, respectively. For the lower class conditions, the difference in the ratings of disgust between pictures of blacks and whites were larger and in the opposite direction (more disgust towards blacks vs. whites) for the amygdala group vs. the

comparison. For the upper class conditions, the difference in the ratings of pride between black and white conditions was again larger for the amygdala patients, but in the same direction as the comparison (more pride towards whites vs. blacks) (see Figure 6.5).

Insula

Similar to the amygdala results, Fisher's exact tests comparing emotional ratings of blacks and whites within each class condition revealed no significant differences for the insula patients, while the only significant difference for the mixed-effects regression model was for the feeling disgust in the lower class condition. However, this difference was in the opposite direction of the amygdala and in the same direction with the normal/BDC group; insula patients reported significantly more disgust towards pictures of white vs. black lower class people ($p < 0.01$).

Contrasts conducted after mixed-effects regression show that the insula group did not significantly differ from the normal/BDC on any conditions of interest. However, there were some significant differences between the relative ratings (black vs. white) of the insula and the normal/BDC groups. The relative racial evaluations of the insula and the normal/BDC subjects differed in happiness for upper class ($p < 0.01$), envy for upper (marginally significant, $p < 0.062$) and middle class ($p < 0.01$), and sadness for lower class (marginally significant, $p < 0.054$) (see Figure 6.6). In all these differences, the insula patients' relative ratings of the race conditions were in the opposite direction of the normal/BDC. For example, while respondents in the normal/BDC reported feeling more envy for the white middle vs. black middle class condition, the insula patients reported feeling more envy for the black vs. white middle class.

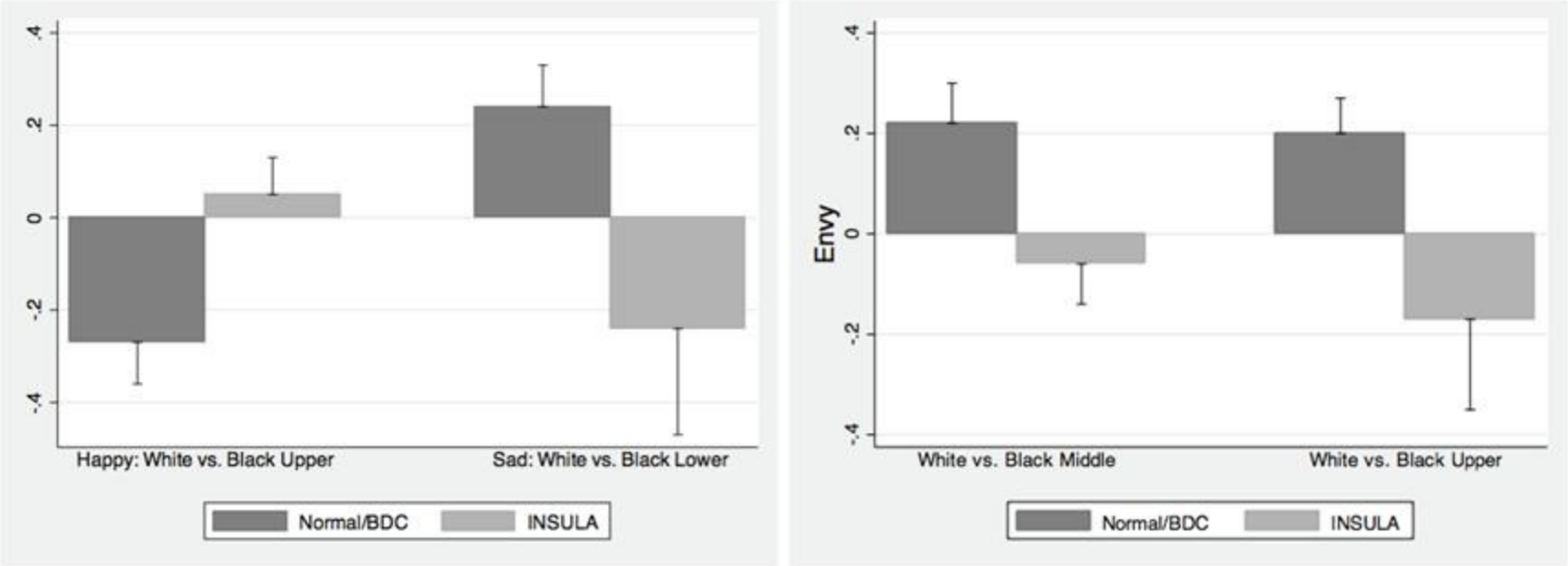

Figure 6.6 Coefficient differences between white vs. black conditions within the insula and the comparisons for the emotions of happiness, sadness and envy. Negative values indicate stronger emotion for black vs. white race conditions. Error bars indicate standard errors.

Discussion

Results from my analyses support previous research indicating that the VMPFC is a convergence/divergence zone where bodily states are coupled with emotional stimuli (Somatic Marker Hypothesis, Damasio 1994; Bechara and Damasio 2005). Accordingly, I find that for the emotions that are high in approach and low in avoidance (happiness and pride), the VMPFC group is more likely to favor whites over blacks than the normal/BDC. These findings provide partial support for the first hypothesis suggesting that the VMPFC is indeed an important neural substrate for sympathetic gradationalism. However, they also suggest that the VMPFC has a more general role in emotions since VMPFC damage was also related to emotional differences between racial-groups in primary emotions like happiness and in moral emotions outside of this quadrant like disgust.

Additionally, these results also contribute to the literature by showing that the role of the VMPFC in racial bias might be more specific to the regulation of high approach/low avoidance emotions. My findings implicate that in social evaluations the VMPFC functioning is important for not only moral but also basic emotions that are high in approach and low in avoidance. This suggests that while the VMPFC might be a hub of associations for the emotions in general, for social interactions and relationships, its role appears more confined to high approach/low avoidance emotions that are positively valenced.

These findings would also fit with the previous research finding of increased activation in the VMPFC when subjects are trying to reappraise the affective meaning of negative pictures (i.e. decrease negative evaluation) and in response to reward based decision making (e.g. winning points in a game, monetary reward, listening to consonant music, perceived attractiveness of faces) (Blair et al. 2006; Blood et al. 1999; Johnstone et al. 2007; O'Doherty et al. 2001, 2003; Urry et al., 2006). However, it is important to note that the bilateral damage to the VMPFC did not eliminate the report of feeling

positive emotions all together but rather it had a more subtle effect on the relative ratings of the high approach/low avoidance emotions across racial groups. Therefore, it can be argued that the VMPFC's functions are more critical for the regulation rather than generation of social emotions. This would buttress the assumption regarding its role in the more subtle and gradual process of sympathetic gradationalism.

Another implication to be drawn from these results is the VMPFC's role in evaluating the more rewarded and highly prized social group members. With reference to social situations, high approach/low avoidance emotions are often aroused in response to groups that are positively valued. This research suggests that the VMPFC is important for triggering racial bias within the social class groups that are more highly valued by society (the middle and upper class). These results fit with previous literature showing that the VMPFC activation is associated with mentalizing about similar vs. dissimilar others, humans vs. objects, or unstigmatized vs. stigmatized others (Harris, Todorov, and Fiske 2005; Mitchell, Banaji, and Macrae 2006; Harris and Fiske 2006). However, the majority of experimental research on racial bias (or other social biases) fails to take into account how racial evaluations intersect with other social categorical evaluations. This results in viewing social bias as animosity and dislike towards all members of a group and fails to unravel a more nuanced and dynamic system of biases that also include positive evaluations and emotions. Where previous theories suggest universal negativity, by identifying the potential differences between the emotional responses to different social groups within racial groups, my dissertation uncovers some of the hidden mechanisms that perpetuate racial inequality through supposedly positive evaluations.

When we turn to the findings pertaining to the amygdala, we see that while the amygdala is engaged in an overall emotional processing, my findings implicate it as also more specifically involved in racial evaluations of out-group class members. This provides partial support for the blended racism hypothesis. Therefore, evaluation of out-group class and race members that are usually portrayed negatively in the media (like

poor people or blacks) might be posing an ambivalent threat and might thus be related to the amygdala activity more than in-group members. These findings are also concordant with the view that the amygdala is related to emotional vigilance, especially related to the ambiguous external stimuli rather than specific types of emotions (Davis and Whalen 2001).

These results extend previous research that finds no impairment in explicit (measured via Modern Racism Scale) or implicit (measured via Implicit Association Task) measures of racial attitudes (Phelps, Cannistraci, and Cunningham 2003) for amygdala-damaged patients. Similar to this previous research, I also find no differences between amygdala patients and the comparison groups on explicit measures; however, I find differences in the emotional racial evaluations. This discrepancy suggests that explicit survey instruments as well as implicit reaction time tests might not be a good indicator of emotional bias, and thus studies relying solely on these measures might be missing important, emotional components of racial attitudes.

Additionally, I found that while patients with amygdala lesions differ from the comparison group in both basic (e.g. happiness) as well as moral emotions (e.g. disgust), these differences lead to an emotional racial preference only in the moral emotions of pride and disgust. This might be due to the amygdala's specific role in social emotional processing (Baron-Cohen et al. 2000). Previous research found that amygdala damage impaired social emotions (like guilt, admiration and arrogance) more than basic emotions (Adolphs, Baron-Cohen, and Tranel 2002). These results suggest that perhaps rather than automatically categorizing humans into different racial groups, the human brain might be encoding other socially valued properties from the face region. This would mean that racial bias and encoding is not hard-wired into humans and racial categorization is not unavoidable.

The insula patients showed different patterns of responses on a broader range of emotions across all class-conditions. While these findings support other research

revealing the insula is related to emotional arousal in response to both negative and positive stimuli (see Phan et al. 2002 for a review), they fail to support my prediction that the insula damage would impair emotional responses in a way that would affect racial evaluations in the out-group class conditions (upper and lower). The emotional racial evaluation differences between the insula and the normal/BDC group were all on the highest rated emotions (e.g., sadness for lower class). The emotions that are rated the highest are likely those that are felt most strongly, thus insula damage might be leading to racial evaluation differences more specifically in these emotions. This suggests that the insula plays a more general role in integrating affective and cognitive processes; and thus, its role in the apathetic racism theory should be revised to include overall embodiment processes in both sympathetic gradationalism and blended racism. This revision might help delineate the differences in the embodiment of bias against different class groups.

CHAPTER 7: FUNCTIONAL NEUROIMAGING STUDY

Apathetic racism theory argues that white Americans draw boundaries between themselves and blacks in ways that separate race bias within the class in-group (sympathetic gradationalism) from race bias in class out-groups (blended racism). Bridging the neurological and sociological literature examining morality, emotions and prejudice, I expect racial biases within the in-group and out-group – in this case, comprised of subtle social class markers -- rely on distinct neural systems. While, the VMPFC is central to race bias within the class in-group, the amygdala and the insula are the primary regions involved in race bias within the out-group. Current research fails to capture these subtleties within race bias omitting the motivational basis for it or the effects of socio-economic conditions. For example, the most common stimuli used in most studies are facial pictures of black or white individuals without any distinguishing context. Moreover, neurological studies often focus on the amygdala as the sole substrate of racial bias due to its association with processing fear and aversive stimuli. However, without understanding the specifics of how racial bias operates, some types of race bias will go unnoticed and the distinctions in the experiences of different social class members will be overlooked.

To test the assumptions of the apathetic racism theory, I carried out a functional Magnetic Resonance Imaging experiment (as also explained more generally in Chapter 4), in which pictures of white and black people from different social class positions are viewed by white participants in a scanner. I also collected emotional evaluations of the respondents outside the scanner on a computer. In this chapter, I report and discuss the findings from this experiment conducted to test the following predictions:

Sympathetic gradationalism:

Hypothesis #1: There will be increased VMPFC activation in response to white middle class vs. black middle class conditions.

Blended racism:

Hypothesis #2: There will be decreased amygdala and insula activation in response to white lower and upper class vs. black lower and upper class conditions.

Methods

Participants

Fifteen right-handed adults with no history of neurological or psychiatric disorders were recruited (see Chapter 4 for recruitment strategies). Participants were compensated a total amount of $40.00 for their participation. All participants passed MRI safety screening before starting the experiment and provided written informed consent. The data of two subjects were discarded from further analysis because of excessive head movement within the MRI machine (if the Euclidian norm of motion derivatives were above 4 mm in more than 10 percent of the data). The final sample size is thirteen subjects (7 male, 6 female, mean age = 47.2 s.d. = 7.6, mean education = 14.5 s.d. = 2.2).

Stimuli and Procedure

After completing informed consent, participants were told that the purpose of the study is to investigate how the brain gives emotional responses to pictures of people vs. objects and non-human animals.[15] Subjects were instructed to watch the pictures attentively and try not to move and stay awake in the scanner.

Subjects' brains were scanned while viewing pictures in eight conditions: white lower class, white middle class, white upper class, black lower class, black middle class, black upper class, non-human pleasant and non-human unpleasant. The pictures for the project are chosen from the International Affective Picture System (IAPS) (Lang et al. 1995) and the World Wide Web (WWW). See Chapter Four for more on picture set

[15] Directly after the experimental task is completed, participants were debriefed about the complete purpose of the study and why omission of some information was necessary.

construction and evaluation. A pseudorandomized block design consisting of eight runs and eight blocks per run was used. While the blocks were fixed across the runs, they were randomized within the run and the runs were randomized across the subjects. Each block consisted of three pictures and 6 seconds per picture was applied (pictures were fixed within the run). Eight blocks (a total of 24 pictures) were used for each condition. All pictures were shown on a black background and a green cross-hair fixation on a black background was displayed between each block to allow for a complete return of the hemodynamic response to baseline levels. The pictures were presented on a computer screen via E-prime. Each picture was centered and took up seventy-five percent of the screen (resolution 1024x768). The presentation of the pictures was controlled by the E-Prime programming software.

All pictures were presented again (on a computer via E-prime) immediately after the imaging session, Subjects evaluated the pictures on eight emotions (happy, pride, sad, pity, angry, disgust, envy and fear), first as whether or not feeling that emotion ("yes" coded as 1, "no" coded as 0), and then if the answer is yes, to what extent each emotion is felt (ranging from 1 "very low" to 5 "extreme"). Additionally, reaction times (how fast they pressed "yes" or "no" for each emotion) were collected for each picture. In addition to this picture rating task, participants' baseline affective states (the Positive and Negative Affect Schedule, PANAS), explicit racial attitudes (Stereotype Assessment Scale, Symbolic Racism Scale, Racial Contact Questionnaire) and demographic characteristics were collected. Manipulation checks were implemented as an exit questionnaire.

fMRI Image Acquisition and Analysis

Scanning was performed at University of Iowa's MR Research Facility using a Siemens 3T TIM Trio MRI scanner. Anatomic data consisted of volumetric T1-weighted MP-RAGE images (repetition time (TR)/echo time (TE)/inversion time (TI):

2530/3.09/900 msec, FOV: 256 x 256 x 240mm, matrix: 256 x 256 x 240, slice thickness: 1 mm, flip angle: 10°). Functional data were acquired with blood oxygen level dependent contrast echo-planar imaging (TR/TE of 2000/30 ms, FOV: 220 mm, matrix: 64 x 64, slice thickness/gap: 3.5/0.525 mm, number of slices = 31 transversal slices, flip angle: 90°).

Data were processed with AFNI (Cox, R.W., 1996. AFNI: software for analysis and visualization of functional magnetic resonance neuroimages). Functional data were processed with AFNI [Analysis of Functional NeuroImages] software (Cox, 1996). Each functional run (echo-planar image) was composed of 155 temporal volumes (number of repetitions). The two first volumes corresponding to the stabilization period of the magnetic signal were not considered for further analysis. Anatomical images were normalized to the Montreal Neurological (MNI) space using the MNI-152 template (average volume of 152 normal brains).

Preprocessing of echo-planar imaging data included a) removal of large signal deviations of 2.5 SD or greater from the mean using an AFNI despiking algorithm applied on a voxelwise basis, b) slice-time correction to account for differences in acquisition time between slices for each whole-brain volume, c) co-registration with the anatomical images and transformation to the TT-N27 atlas – aka Colin brain- within AFNI (3-mm isotropic voxels), d) 3-dimensional volume registration (all EPI runs were coregistered with the 5th volume from the first imaging run using a heptic polynomial interpolation method), e) smoothing with a Gaussian spatial filter of 4 mm, and f) scaling of blood oxygen level–dependent signal intensity to percentage of signal change using each subject's voxelwise time series mean as a baseline.

A deconvolution (with AFNI's 3ddeconvolve) analysis was used to extract a hemodynamic response function (HRF) for each subject. The effects of the conditions were modeled by box-car regressors convolved with the hemodynamic response function for 18 seconds for blocks of each trial type. Motion correction parameters were included

as nuisance covariates and the TRs with motion derivatives exceeding the Euclidian norm of 0.4 mm were censored in deconvolution analysis.

Group-level analyses on the hemodynamic response estimates from the individual-level analysis were conducted in two ways: a) Group-level ANOVA and b) Region of Interest (ROI) analysis. An intersection mask with 70% overlap, obtained from the normalized and co-registered maps individual-level union masks, was applied to whole-brain group-level analyses. First, a two factor mixed-effects analysis of variance (ANOVA) in which condition (black low, black middle, black high, white low, white middle, white high, non-human pleasant and non-human unpleasant) was the fixed (within subjects) factor and percentage BOLD signal changes from each participant was the random (between-subjects) factor was applied. Second, ROI masks were applied on the same ANOVA analysis to isolate activation in the hypothesized brain areas (the mPFC, amygdala and insula). In this method, different analyses are carried out for each brain area that is of interest. I conducted separate ANOVAs for the MPFC, amygdala and insula. The ROI masks for the amygdala and the insula were generated from the Eickhoff-Zilles cytoarchitectonic probabilistic atlas (AFNI's CA_N27_ML Atlas). This atlas provides Eickhoff-Zilles macro labels from N27 in Talairach TT_N27 space. The ROI in the mPFC was generated using a 10-mm sphere centered at coordinates (2 -48 -7 in RAI coordinates) based on previous research (Harris and Fiske, 2006, Schreiber an Iacoboni 2012).

Unless otherwise noted, all reported clusters survived a statistical threshold of $p < .05$, corrected for multiple comparisons by using AFNI's 3dClustSim command to guard against identifying false-positive areas of activation (Forman et al. 1995; Ward 2002). 3dclustsim carries out Monte Carlo simulations to calculate the minimum number of voxels necessary to achieve a given family wise corrected alpha level based on the voxel geometry of a data set. Using the parameters of my data set (FWHM=5.8), running 10000 iterations over the brain-only mask used in whole-brain group-level analyses indicated

that for a corrected cluster-wise activation threshold of $p < 0.05$ the minimum cluster sizes of 37 and 24 should be considered for voxel-wise thresholds of $p < 0.01$, $p < 0.005$, respectively. For a corrected alpha-level of .05 using an uncorrected threshold of .05, running Monte Carlo simulation on ROI masks also indicated the minimum cluster sizes of 20, 9, 25 and 24 for the MPFC, the left and right amygdala, the left insula and the right insula regions respectively.

Results

Behavioral Results

First, looking at the proportions of reporting 'yes' for feeling each emotion, we see that the most frequently reported emotions for pictures of blacks and whites in each class position group are the same. For pictures of both black and white people, the highest rated emotions for the poor people are sadness and pity, and the middle class and rich people are happiness and pride.

Table 7-1 The proportions of reporting 'yes' for feeling each emotion

	Angry	**Happy**	**Sad**	**Fear**	**Pity**	**Pride**	**Envy**	**Disgust**
Black Lower	42%	8%	86%	25%	80%	7%	2%	43%
White Lower	38%	7%	89%	24%	82%	6%	2%	42%
Black Middle	1%	84%	1%	1%	1%	49%	25%	1%
White Middle	2%	87%	2%	1%	1%	52%	37%	2%
Black Upper	3%	62%	4%	2%	2%	42%	37%	6%
White Upper	6%	60%	5%	2%	3%	45%	40%	13%
Non-human Pleasant	0%	85%	2%	0%	1%	29%	10%	1%
Non-human Unpleasant	27%	7%	24%	65%	9%	2%	0%	54%

I examined the effects of each condition on these emotions by fitting restricted maximum likelihood multilevel mixed-effects models (with Stata's xtmixed command). Emotions are introduced to the models as continuous emotional intensity variables (combining the 'yes/no' variable with the intensity of the emotion, the new variable ranges from 0 "none" to 5 "extreme"). Additionally, reaction times (how fast they pressed "yes" or "no" for each emotion) were analyzed[16]. All models control for age, gender, education, positive and negative PANAS scores as well as explicit racial measures (variables are centered around their mean).

Results show that there are no reported emotional rating or reaction time differences in response to pictures of blacks and whites across class conditions. It should be noted that the picture-rating task took place after the functional imaging. Thus subjects are likely aware of the purpose of the experiment by the time they are rating pictures. There were significant differences in both emotional rating and reaction times between class conditions (collapsed across race).[17] These differences are in line with the proportions reported in Table 7.1. Accordingly, respondents rated feeling more angry, disgust, fear, pity and sadness and less envy, happiness and pride towards lower class vs. upper and middle ($p < 0.01$). The only significant difference between middle and upper class was higher ratings of happiness in response to middle vs. upper class ($p < 0.01$).

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[16] In order to eliminate responses that might be given inattentively (i.e. too fast or too slow), reaction times larger than 2 standard deviations were replaced with the mean and smaller than 150ms were replaced with '150ms' (Previous research shows at least 100ms is required to have a genuine physiological response, Luce 1986). In order to normalize the distribution of this variable, logarithmic transformation was applied (see Greenwald et al. 1998, or Whelan 2008 for data reduction techniques).

[17] None of the explicit racial attitude measures (symbolic racism, stereotype knowledge or contact questionnaire) were significant on either emotional rating or reaction times. Age has a significant positive effect on reports of sadness ($p < 0.05$) and pity ($p < 0.01$), education has a significant impact on envy, pity as well as reaction time for envy ($p < 0.05$), and positive affect schedule (positive PANAS) has a significant positive effect on anger, happiness, sadness and pity ($p < .05$).

Interestingly, reaction times for pictures of middle and upper class people were faster than those of lower class for all emotions ($p < 0.01$).

fMRI Results

Whole-Brain Analysis

The areas of significant activation for each condition from the whole-brain ANOVA are reported in Table A-30 of Appendix. To identify the differences in the activation of brain regions across conditions, I included specific tests contrasting conditions in the ANOVA. Below and on Table 7.2, I summarize these results. Overall the results support the first prediction, partially support the second prediction and fail to support the third prediction.

Race Contrasts

The only significant activation cluster that survived the thresholds was observed in the contrast of middle class whites vs. blacks. Significant activation in the left superior orbital gyrus was revealed for white middle class vs. black middle class (x, y, z =11, -26, -16, $t = 4.603$, p corrected < 0.05). As the orbital gyri is contained in the ventromedial prefrontal cortex (Phillips, MacPherson, and Della Sala 2002), this finding supports the sympathetic gradationalism prediction that the VMPFC is selectively involved in race bias favoring white middle class vs. black. This finding is also consistent with the previous research indicating the involvement of this region in moral empathy, personal and emotional moral evaluations, perspective taking or ability to empathize with others, dehumanization processes as well as reward and pleasure mechanisms (Bechara, Damasio, and Damasio 2000; Greene et al. 2001; Harris and Fiske 2006; Kringelbach and Berridge 2009; Mitchell et al. 2005). None of the other race contrasts (e.g. black low vs. white low) produced a statistically significant difference.

Table 7-2 Regions of activation elicited by the contrasts in a whole-brain analysis

Anatomical Location	Volume (mm^3)	x	y	z	Maximal t-score	Anatomical Location	Volume (mm^3)	x	y	z	Maximal t-score
White Middle> Black Middle:						***White Upper > White Low:***					
Left superior orbital gyrus	1026	11	-26	-16	4.603	Left Medial Temporal Pole	1296	35	-17	-28	-5.506
White Middle > White Low:						Right ParaHippocampal Gyrus	1242	-26	8	-28	-4.931
Left Fusiform Gyrus	2430	29	11	-28	-5.617	Left Anterior Cingulate Cortex	1161	2	-32	18	5.525
Right Middle Cingulate Cortex	1971	-2	-11	36	4.96	***Black Upper > Black Low:***					
Right Fusiform Gyrus	1890	-32	11	-31	-5.827	Left Middle Occipital Gyrus	1107	29	89	9	-4.255
Middle > Low:						***Upper > Lower:***					
Right SMA	5238	-5	11	66	8.015	Right SMA	4941	-5	-2	60	6.98
Left Cuneus	3672	-5	89	12	5.969	Right Middle Frontal Gyrus	1782	-38	-44	12	5.283
Right Middle Frontal Gyrus	1809	-44	-41	12	7.327	Left Insula Lobe	1755	38	-11	-4	6.738
Left Caudate Nucleus	1053	17	5	21	6.512	Right Middle Occipital Gyrus	1431	-38	83	6	-5.123
Right Inferior Temporal Gyrus	1026	-50	2	-34	-5.043	***Human > Nonhuman:***					
White Middle > White Upper:						Left Temporal Pole	25677	53	-11	-4	-9.999
Right Cerebellum	4833	-23	74	-25	7.618	Right Temporal Pole	11016	-47	-14	-7	-8.411
Right Inferior Temporal Gyrus	2295	-47	65	-7	5.503	Right Inferior Temporal Gyrus	7695	-50	68	-7	8.293
Right Cuneus	1269	-17	77	39	4.823	Left Inferior Parietal Lobule	6696	56	38	42	-7.779
Right Superior Parietal Lobule	1269	-32	62	45	6.323	Right Lingual Gyrus	5076	-5	83	-13	-6.81
Left Middle Occipital Gyrus	1242	44	77	6	5.992	Right Rectal Gyrus	3780	-2	-47	-16	7.539
Black Middle > Black Upper:						Left Precuneus	3591	-2	65	24	6.658
Left Cerebellum	9585	-2	83	-19	7.354	Right SupraMarginal Gyrus	2943	-62	35	24	-6.966

Table 7-2 Continued

Anatomical Location	Volume (mm^3)	x	y	z	Maximal t-score	Anatomical Location	Volume (mm^3)	x	y	z	Maximal t-score
Middle > Upper:						Right Middle Temporal Gyrus	1674	-59	-2	-19	5.954
Left Cerebellum	17955	-2	83	-19	11.011	Right Superior Occipital Gyrus	1188	-23	86	12	-7.058
Right Inferior Temporal Gyrus	7965	-50	68	-7	5.939	Left Anterior Cingulate Cortex	945	2	-5	30	-5.997
Right Precuneus	1809	-5	71	39	5.561	Left Cerebellum	675	47	44	-25	-8.256
Left Middle Occipital Gyrus	1377	44	77	6	6.266	Left Middle Cingulate Cortex	675	2	-14	36	-5.01
Left Inferior Parietal Lobule	999	29	59	39	4.307						

Note: Anatomical Locations are based on nearest voxel coordinates on the Eickhoff-Zilles atlas (AFNI's CA_N27_ML Atlas). Peak activation is reported inTalairach coordinates (RAI). Uncorrected $p < 0.01$, corrected $p < 0.05$

Class Contrasts

In addition to race contrasts, I also contrasted class groups both within each racial group (e.g., white low vs. white middle) and by averaging across racial groups (e.g., middle vs. high). As can be seen on Table 7.2 class contrasts reveal more activation differences than race contrasts; moreover, class contrasts within white indicate more differences that those within blacks.

Middle vs. Low

When we look at class differences within the white group, we see greater middle cingulate cortex activation for the middle class white condition compared to lower class white condition. These findings corroborate previous research showing that increased middle cingulate activity is related to self-related decisions and evaluations in contrast to other (Chiu et al. 2008; Jackson et al. 2006; Singer et al. 2004; Tomlin et al. 2008). My findings further this research by suggesting that the role of the middle cingulate might be extended from self to similar others or the in-group. Additionally, previous research indicates that the fusiform gyri have an important role in processing faces (Haxby et al. 2000; Kanwisher et al. 1997). Moreover, the fusiform gyri activation is moderated by emotional expressions (Vuilleumier et al. 2001; Vuilleumier and Pourtois 2007). For example, coupled with amygdala activation, heightened fusiform activity was related to detecting fear in facial expressions (Vuilleumier et al. 2001) and in response to untrustworthy faces (Winston et al. 2002). Similarly, my results also reveal lower bilateral fusiform gyri activation for the middle class white condition compared to lower class white condition. Analyses revealed no significant differences between the black middle class and black lower class categories.

Looking at the overall class (averaged across racial groups) contrasts, the most striking finding is the increased activation of the right middle frontal gyrus when looking at pictures of middle class compared to lower class people. Previous studies observed

activation in middle frontal gyri during self-awareness or introspective tasks (e.g., viewing your own face, thinking about own emotions) and making individuated/personalized judgments about others rather than superficial ones (Freeman et al. 2010; Goldberg et al. 2006; Sui and Han 2007). Another important finding in this contrast is the increased left caudate activation in response to middle vs. lower class conditions. The caudate nuclei, a subsection of the ventral striatum, have links to the dorsolateral and orbital parts of the frontal cortices and therefore are linked to cognition and emotions (Lieberman 2000; Cummings 1993). Previous functional imaging studies show that caudate activation is related to reward-based learning as well as reciprocal social cooperation (Delgado et al. 2000; Haruno et al. 2004; Schultz 1998). Additional activation and deactivation is observed in visual processing and motor areas, SMA (Supplementary Motor Area), cuneus and inferior temporal gyrus.

Middle vs. Upper

Results indicate increased right cerebellum activity for viewing pictures of white middle vs. white upper class people. While, cerebellum is primarily considered to be involved in body movement coordination, there is also a growing body of research relating its functions to emotions and the self. For example, previous research reports that cerebellum activity associated with self-generated emotions as well as self-referential encoding of emotional words (remembering emotionally valenced words) and mental state decoding from non-verbal cues (Adams et al. 2010; Damasio et al. 2000; Fossati et al. 2004). There is also greater activation in the brain regions involved in awareness of movements (superior parietal lobule, MacDonald and Paus 2003) as well as visual processing like the inferior temporal gyrus, cuneus and occipital gyrus for the white middle class condition in contrast to white upper class. The only significant difference for the black middle vs. black upper class contrast is increased activation in the left cerebellum. Looking at the overall middle vs. upper class contrast, again we see increased

activation in the brain regions associated with visuo-spatial processing. These findings might be related to greater attention and memory performance given to the in-group category.

Upper vs. Lower

Contrasting upper and lower class conditions within white conditions reveal decreased activity in the left medial temporal pole and right parahippocampal gyrus, and increased activation in the left anterior cingulate cortex (ACC). These results converge with those of previous studies showing greater activity in the temporal pole in response to sad facial expressions as well reading as guilt and indignation-evoking statements (Blair et al. 1999; Green et al. 2010). Decreased parahippocampal gyrus activation with respect to the upper vs. lower class conditions is also an interesting finding considering previous research reported greater activation in this region in response to expectancy violations, suspicion and uncertainty (e.g. evaluating others in bargaining game) and when making judgments regarding dehumanized others (e.g. drug addicts) (Bhatt et al. 2012; Harris and Fiske 2007).

The ACC, on the other hand, is activated in various functional imaging studies of stereotypic attitudes and racial attitudes (e.g., Cunningham et al. 2004; Richeson et al. 2003). Based on this research, one of the roles of the ACC in social bias (including race bias) is hypothesized to be executive control and regulation of social bias (Stanley, Phelps, and Banaji 2008, see also MacDonald et al. 2000). For example, Xu (et al. 2009) find that painful stimulations applied to racial in-group faces induce increased ACC activity compared to out-group races suggesting ACC's role in detecting and controlling aversive reactions involving in-group members (high approach and high avoidance dimensions in my motivational systems theory). Despite the involvement of these regions in upper-lower class contrasts within the white racial condition, the only significant

difference for the black racial condition appears to be the left middle occipital gyrus (visual processing).

When we look at the contrasts between the upper and lower conditions collapsed across racial categories, interestingly we see increased activation in the right middle frontal gyrus and left insula for the upper class condition. The activation in the right middle frontal gyrus is comparable to that of in the contrast of the middle vs. lower class conditions implicating middle and upper class conditions are considered more as in-group categories compared to lower class and thus there is more empathy and mental perspective taking for these groups. The insula, on the other hand is activated in response to facial expressions of disgust, faces judged untrustworthy, pictures of dehumanized and stigmatized others (Harris and Fiske 2006; Krendl et al. 2006; Phillips et al. 1997, 1998; Winston et al. 2002). These findings indicate the insula's role in aversive emotions and implicate a potential aversion from the upper class conditions especially in contrast to a lower aversion and approach group: lower class.

Region of Interest Analysis

The main effects of the conditions from the ROI analyses are summarized in Table A-31 in Appendix and Table 7.3.

MPFC

The results of the MPFC ROI analyses converge with the whole brain analysis and previous literature and provide support for the first prediction. The only significant activation clusters (relative to the fixation cross) are for the white and black upper social class and the white middle class (but not black) conditions (corrected $p < 0.05$) (see Table A-31 of Appendix). Accordingly, there is greater MPFC activation while viewing pictures of white middle class vs. black middle class people ($t = 3.247$, p corrected < 0.05, see Figure 7.1). The only other significant contrast in this ROI analysis is the contrast of viewing pictures of humans (collapsed across all race and class groups) vs.

viewing pictures of non-human (pleasant and unpleasant collapsed). My results reveal increased MPFC activation while viewing pictures of humans vs. non-humans ($x = -2$, $y = -53$, $z = 16$, $t = 7.267$, p corrected < 0.05). These findings are somewhat consistent with the previous research showing a lack of MPFC involvement involved in dehumanization of moral out-groups (Harris and Fiske 2006). However rather than a complete lack of activation as suggested by the dehumanization theory, my results show decreased activation in response to non-humans and black middle class. These results support my predictions that rather than a general dehumanization or moral exclusion process, the ventromedial prefrontal cortices might be involved in an emotional mechanism specific to high approach/low avoidance motivational system.

Amygdala

Results from the amygdala ROI reveal that while the right amygdala is activated in all conditions except the non-human pleasant pictures, the left amygdala is activated in all conditions (corrected $p < 0.05$). These findings suggest that the amygdalae might have a general role related to emotional arousal (see Phan et al. 2002). The results show that the right amygdala activation is significantly different only between white lower and black lower conditions. There is lower right amygdala activation for the white lower vs. black ($t = -5.547$, p corrected < 0.05) (see Figure 7.2). On the other hand, the only significant left amygdala activation difference is the contrast between humans and non-humans. There is decreased activity for the pictures of humans vs. non-humans ($t = -3.782$, p corrected < 0.05). The difference between the right and left amygdala might be due to their respective roles in conscious vs. unconscious emotional processing. For example, Morris, Öhman, and Dolan (1998, 1999) report increased right amygdala activation in response to masked presentations (stimuli depicted in a very short duration and is not consciously recognized, thus ‘unseen’) of anger- and fear-conditioned faces, while left amygdala is only involved in unmasked and hence conscious presentations.

Table 7-3 Regions of activation elicited by the contrasts in ROI Analyses

Cluster Size	% Signal Change	S.E.	x	y	z	Maximal t-score	Cluster Size	% Signal Change	S.E.	x	y	z	Maximal t-score
MPFC							**Right Amygdala**						
White Middle < Black Middle:							***White Lower < Black Lower:***						
837	0.19	0.02	-2	-50	-16	3.247	351	-0.10	0.01	-23	2	-10	-5.547
Human < Non-human:							**Left Amygdala**						
2295	1.78	0.06	-2	-53	-16	7.267	***Human < Non-human:***						
							243	-0.45	0.03	26	5	-13	-3.782
Right Insula							**Left Insula**						
White < Black:							***White Middle < Black Middle:***						
675	-0.15	0.01	-41	-17	-1	-4.145	675	-0.07	0.00	32	14	18	-5.249
White Upper < White Lower:													
2052	0.11	0.00	-41	-14	-4	4.493	***White Upper < White Lower:***						
Black Upper < Black Lower:							2106	0.12	0.00	38	-11	-4	3.759
918	0.11	0.01	-38	-14	-7	3.156	***White Middle < White Lower:***						
Black Middle < Black Lower:							513	-0.09	0.01	38	2	3	-4.381
648	0.09	0.00	-35	-20	3	4.343	432	-0.10	0.01	35	17	6	-3.685
Upper < Lower:							***Upper < Lower:***						
2808	0.18	0.01	-41	-14	-7	4.537	2889	0.17	0.01	38	-11	-4	5.656
Middle < Lower:							***Middle < Lower:***						
1215	0.17	0.00	-41	-14	-4	3.713	675	0.18	0.01	41	-11	-4	4.142
Human < Non-human:							675	0.11	0.01	26	-20	9	4.015
6399	-0.58	0.02	-44	-11	-4	-6.184	***Human < Non-human:***						
							8127	-0.52	0.01	44	-5	-1	-8.610

Note: Peak activation. Talairach coordinates (RAI). Corrected $p < 0.05$

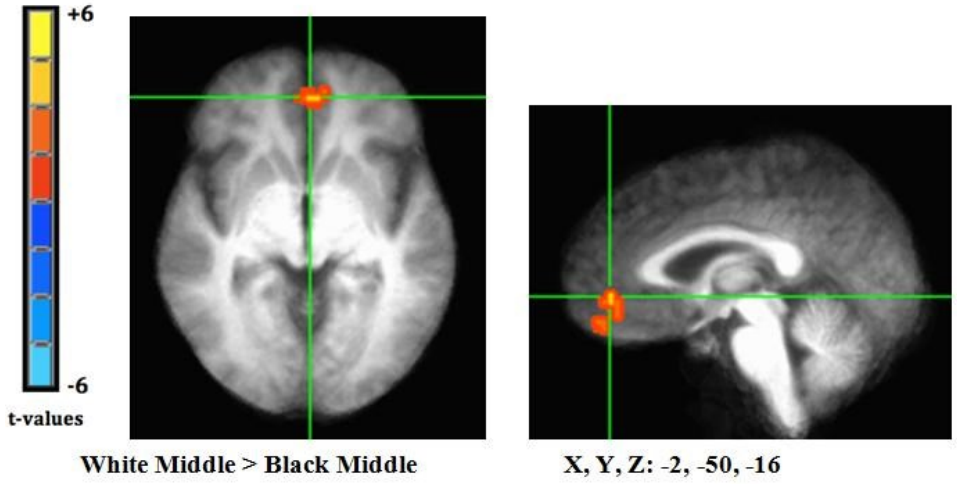

Figure 7.1 Region of the MPFC that was more active during the presentation of white vs. black middle class pictures.

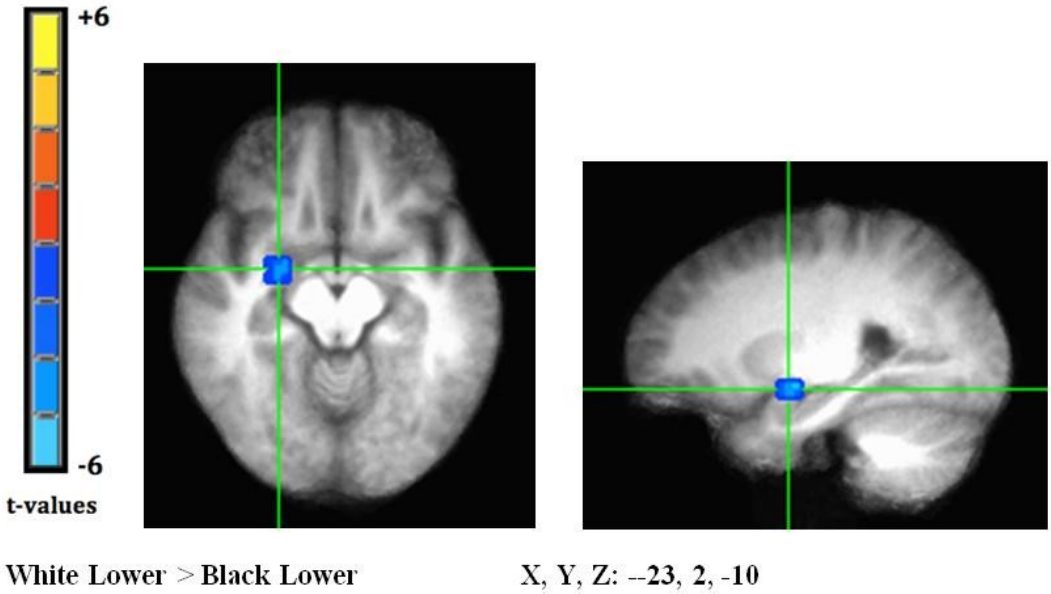

Figure 7.2 Region of the right amygdala that was less active during the presentation of white vs. black lower class pictures.

These findings partially support my prediction that the amygdala is involved in race bias pertaining to out-group class members. They also extend previous research that found increased right amygdala activation when viewing faces of blacks vs. whites (Lieberman et al. 2005; Richeson et al. 2008) by showing that right amygdala is differentially involved in racial evaluations, but only for those from the lower class.

Insula

Unlike amygdala contrasts, there are significant differences across both race and class contrasts for the insula. ROI analyses reveal decreased right insula activation for whites (collapsed across class categories, not specific to a particular class condition) vs. blacks ($t = -4.145$, p corrected < 0.05) and decreased left insula activation for white vs. black middle class conditions ($t = -5.249$, p corrected < 0.05). No significant contrasts were observed for other race conditions. While pointing the involvement of the insula in these race contrasts were in the direction that I predicted (higher for black vs. white), these results fail to support my prediction for the engagement of insula in racial evaluations for the out-group class conditions.

Turning to class contrasts, we see greater insula activation for white upper class vs. lower class bilaterally (see Table 7.3). Collapsed across racial categories, there is greater bilateral insula activity in response to both upper and middle class vs. lower class conditions. However, it should be noted that the significance between middle and lower class conditions is likely due to the heightened activation in response to black middle class since insula activation for the white middle class conditions are negative bilaterally. To put these findings in perspective, when I contrast all human conditions (collapsed across race and class) with non-human (collapsed across pleasant and unpleasant stimuli), I also find increased bilateral insula activation for non-human stimuli compared to human (see Figure 7.3 below).

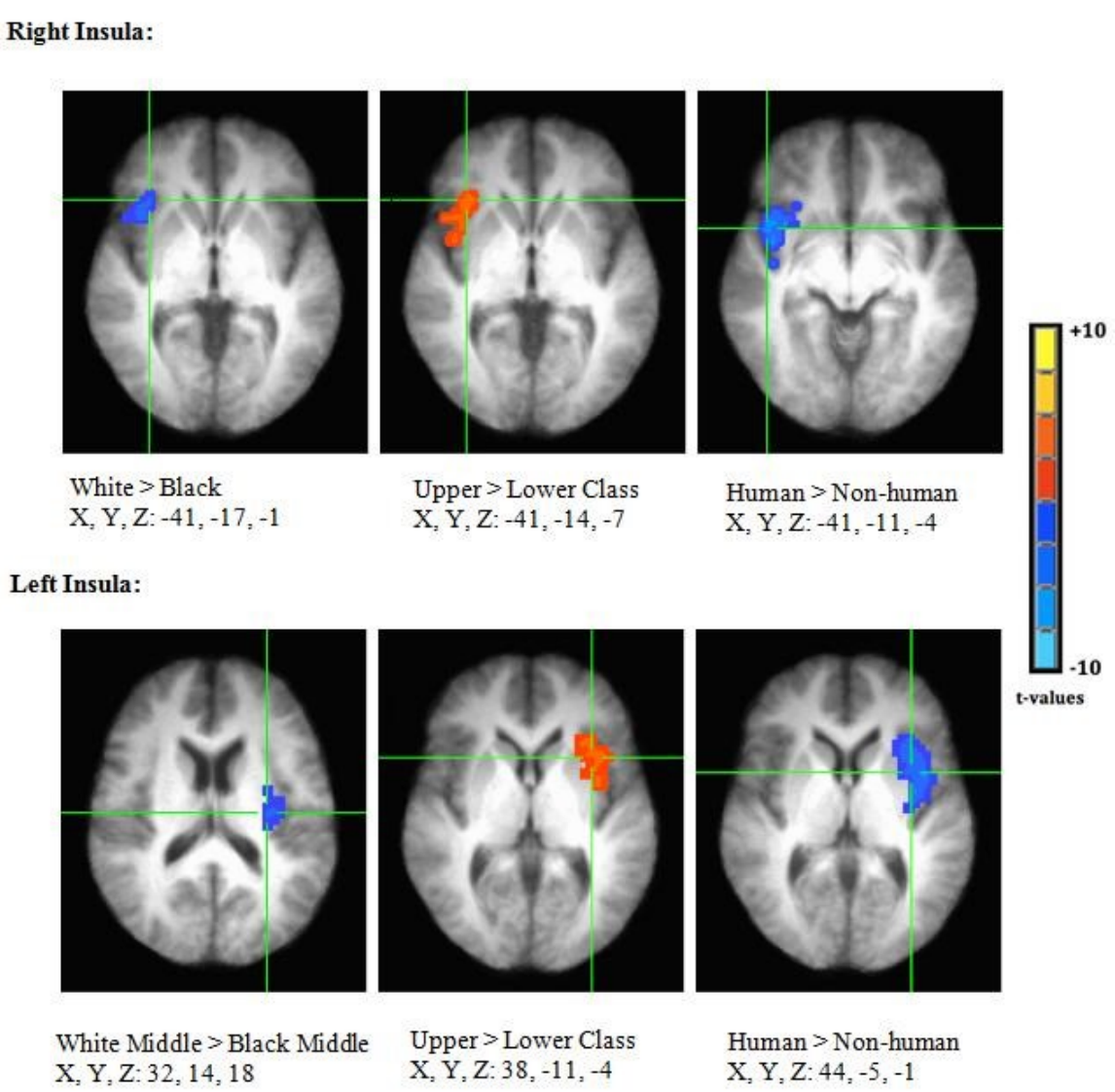

Figure 7.3 Regions of the insula significantly activated for selected contrasts.

Discussion

While my behavioral findings indicated no significant racial evaluation differences, the results of the functional analyses revealed several interesting race and class differences. First, in line with the sympathetic gradationalism argument, results of both whole-brain and ROI analyses have shown increased VMPFC activation in response to pictures of white middle vs. black middle class members. Previous research indicates this region is crucial for social emotions and moral empathy as well as reward processing and pleasure (Berridge and Kringelbach 2008; Damasio 1994; Greene and Haidt 2001). However, the role of MPFC and more particularly VMPFC in race evaluations are poorly understood. While several studies have linked this region to mentalizing about others and empathy (e.g. Frith and Frith 2001; Gallagher and Frith 2002), few studies focused on its involvement in race-evaluations.

Building on previous research, my findings suggest that the VMPFC might have a more specific role in moral-emotional empathy by potentially evaluating or holding the differences in stimuli that are high approach and low avoidance in nature. As I explained in Chapter 3, middle class people constitute the reference or in-group category in the U.S. Interacting with both black and white middle class people likely elicit emotions that are high on approach and low in avoidance (i.e. happiness, pride). However, as implicated in my neuroimaging findings, social evaluations within the middle class group appear gradational; being a black middle-class member puts a person partly into an approach ingroup, but not nearly as much as being a white member of the middle-class. While this view fits with sociological research reporting middle class blacks are still discriminated against despite their desirable class status (e.g. Feagin 1991; Feagin and Sikes 1994), it also extends the field by suggesting race bias operates differently for the middle class members within the human mind. Therefore, this finding exposes that empathy and sympathetic emotions are triggered less towards middle class blacks vs. whites.

Similarly, while there is abundant research on amygdala activation and racial attitudes (e.g., Hart et al. 2000; Lieberman et al. 2005), a more complete perspective taking into account the nuances of race evaluations is missing. Previous studies relied mostly on facial stimuli stripped from any background rather than contextualized photographs, therefore fail to operationalize racial evaluations in a more nuanced and realistic way. I find that right amygdala activation is greater for lower class blacks vs. lower class whites, but there are no activation differences for other class groups. Although this finding fails to fully support the blended racism prediction that amygdala activation will be involved in racial bias in both lower and upper class conditions, it implicates a more aversive bias against poor blacks. These findings also contradict a recent study by Schreiber an Iacoboni (2012). In an experimental task where norm-violating (e.g. gang members, prison inmates) and norm-consistent (families, teachers) pictures of blacks and whites were shown, they find that amygdala activation is related to norm-violation rather than race evaluations. While, I agree with their general argument on the relative importance of normative violations as social norms constitute the codes of a societal moral system, I also think their thesis fails to capture a more complex view on the socio-moral order. As explained in Chapter 3, moral conventions are at the same time cultural evaluation systems inherently tied to structural elements stratifying social life with regards to social position, status and group membership. Thus, more often than not, norm-violation and/or consistency become attributed social groups as a whole (i.e. Muslims).

My results also show that pictures of non-human entities, in addition to upper class whites and blacks (and middle class blacks), elicit increased insula activation. While there is increased right insula activation in response to blacks vs. whites, there is greater left insula activation for the black vs. white middle class conditions. These findings contradict the blended racism prediction that insula will be involved in race bias in out-group class conditions. However, considering previous literature report elevated insula

activity in response to aversive and disgust eliciting stimuli and dehumanized and stigmatized others, these results are interesting (Buchel et al. 1998; Harris and Fiske 2006; Krendl et al. 2006; Nitschke et al. 2006). A more general view on the role of insula in emotions is that it is involved in a broad range of emotions that are self-generated (Damasio et al. 2000). Insula is responsible for evaluation of introceptive emotions and might be engaged in detecting homeostatic changes posing a threat (Reiman et al. 1997 also see Phan et al. 2002). Thus, the insula might be more particular to embodied feelings and emotions. This view is also echoed in studies that find that insula has a key role in taste representation (e.g., Small 2010; Pritchard et al. 1999). The current findings raise the possibility that an automatic moral distaste and more embodied feelings might be involved in not only race evaluation in in-group class categories, but also evaluations of the rich.

Overall, these findings bolster a sympathetic gradationalism hypothesis and provide partial support for blended racism predictions. They suggest that empathic motivations are elicited more towards white vs. black middle class members. Furthermore, increasing aversion is directed towards black vs. white lower class. These results implicate a different form of disadvantage for the middle class compared to lower class blacks. Everyday experiences of the middle class blacks do not revolve around open hostility but rather a subtle and ostensibly positive deprecation, which likely accumulates over time resulting in a cumulative social, psychological, health and financial disadvantage (Conley 1999; Scholz and Levine 2004; Shuey and Willson 2008). Poor blacks, on the other hand, face more antagonistic evaluations leading them to face a disproportionate impediment in finding entry-level jobs or housing and hence struggle in an inescapable cycle of poverty (Neckerman and Kirschenman 1991; Pager and Shepherd 2008; Pager 2008).

CHAPTER 8: GENERAL DISCUSSION

> There's nothing in heads but brains. If you look in heads you are no further along.
>
> Harold Garfinkel, *Ethnomethodology's Program*

This quote from the well-known sociologist Harold Garfinkel is emblematic of the long-standing sentiment in sociology against the brain sciences. While the twenty-first century slowly gave way to a shift in attention towards the neuro- and bio- sciences, unfortunately today mainstream sociology is still reluctant to acknowledge the neurological basis of social behavior (with few notable exceptions, see Franks 2010, 2013). The findings presented in this dissertation offer examples of how what is in our head, in fact, is at the core of understanding human interaction and social behavior.

This study offers a window into seemingly intractable mechanisms of contemporary racism by developing a novel, interdisciplinary theory, referred to as apathetic racism theory, which combines neurological and sociological theories and methodologies. Modern day racial bias is subtle and difficult to measure; it involves a blend of positive and negative feelings and attitudes (Glick and Fiske 2001; Kite and Whitley 2010), and is a very different form than the recent historical past even as inequalities persist. Since it is a passive form of racism that revolves around emotional indifference or apathy rather than blatant hostility, it is more difficult to measure, especially with traditional methodologies. However, it has serious effects on promotion or recruitment decisions, admissions to schools, or housing opportunities that often go unnoticed.

Based on previous research on motivation systems and emotional racial evaluations (Bradley et al. 2001; Cuddy et al. 2009; Dickinson et al. 1979; Fiske and Cuddy 2006; Lane et al. 1997; Lang 1995), I suggest that contemporary racial bias is reinforced through subtle, moral-emotional mechanisms that can be organized under four general domains on a bivariate motivational system. In this view each emotion is

categorized with regards to both approach and avoidance dimensions, perhaps the most basic evolved human social tendencies (see Tooby et al. 2008). Accordingly, modern racial boundaries are characterized by an overall moral apathy, the experience of less intense moral emotions towards blacks than whites, in contrast to blatant forms of bias. Unlike primary emotions, which are evolved to help solve fundamental life problems (Ekman 1999; Tooby and Cosmides 1990), moral emotions are evolved to sustain social interactions and relationships beyond the interest of the self (Haidt 2003; Fiske 2002), and thus are schematized and structured by socially constructed conventions of morality (Lamont 1992; Turner 2000; Turner and Stets 2007). While an implication of the moral apathy argument is that racial bias and categorization are not inevitable (see also Cosmides, Tooby, and Kurzban 2003), another equally important implication is that societal-level ideological and structural changes are required to diminish racism at the individual-level.

Importantly, moreover, racial bias takes different forms depending on the social class positions of the groups evaluated. I refer to racial bias within the middle class group as *sympathetic gradationalism*. As the name implies, in this form of bias whites are sympathetic towards middle class blacks – contrary to some theories of race -- and hold high approach/low avoidance moral emotions like pride towards them; however, this sympathy is gradational, meaning that they still feel less admiration and affection towards black than white middle class members. The theory argues as the middle class members are seen as the class in-group and the socially prized class group by the mainstream American conventions, race bias within the middle class is subtler and relies on a mostly non-conscious neural system. People who feel stronger approach moral emotions toward a target are more likely to help them; this form of racism takes the form of a lack of concern and empathy, rather than taking an active form. It leads to a passivity of opportunity for friendship, information sharing, and other positive actions that are extended toward in-group members.

Societal notions about social class out-groups, on the other hand, are more ambivalent as they include qualities that are sometimes desired (e.g., the luxurious life style of the upper class) or sympathized with (e.g., the hardships faced by the poor) but also can be despised (e.g., perceived lack of work ethic in the poor or the rich). Therefore, I argue that racial bias toward other class out-groups includes a broader array of moral emotions including mostly those that are high in avoidance or low in approach (like envy or pity); and thus, is referred to as *blended racism*. Moreover, as the class bias in the U.S. can more easily be justified or rationalized by the idealized notions of meritocracy, racial bias against the class out-group members also operates at a conscious level alongside potentially non-conscious mechanisms.

Both sympathetic gradationalism and blended racism perpetuate racial inequality. Because sympathetic gradationalism revolves mostly around high approach/low avoidance emotions, it motivates seemingly positive yet still discriminative behavior. This perceived positivity of the motivations cloak the unequal power structure in gradationalism, even as the social actor might have egalitarian intentions. Because blended racism is a mixture of mostly high avoidance and low approach emotions, it motivates a mixture of ambivalent, hostile and aversive judgments.

Additionally, as the previous literature suggests (Bradley et al. 2001; Lane et al. 1997), I hypothesized that sympathetic gradationalism and blended racism will rely on not only separate motivational systems but also separate neural systems. While the ventromedial prefrontal cortex, a brain region key for socio-moral emotional regulation and empathy, will be crucial for sympathetic gradationalism, the amygdala and the insula, brain regions associated with aversion and social stigmas, will be related to blended racism. In other words, when evaluating somebody perceived to be a member of your social group – class apparently being paramount – empathetic regions channel and shape incoming information. If somebody appears to be from an out-group, we judge them more harshly and with less empathy.

Implications for the Apathetic Racism Theory and The Study of Race Bias

Findings from three experiments partially support the apathetic racism theory, and instruct its further development. Below, I summarize the findings from the analyses and then discuss the implications for my theory as well as the study of racial bias.

Sympathetic Gradationalism and Evolutionary Implications

Findings from this dissertation support moral apathy as a microsociological aspect of continuing racial bias in America. For example, participants were more likely to report feeling moral emotions (envy, pity) for whites vs. blacks. This suggests that racial in-groups are subject to moral evaluations, contrasting with dehumanizing views of racial out-groups. As such, race seems to be a core mental organizing characteristic, as much literature suggests, but it is vitally conditioned on perceived social class membership. There was also partial support for the sympathetic gradationalism argument of apathetic racism theory. While subjective reports in Experiment 1 did not support the prediction that the participants will report more pride towards middle class whites vs. blacks, the other experiments provided evidence in the role of the VMPFC in racial bias within the middle class. This implicates the role of the VMPFC in high approach/low avoidance moral emotions, and thus sympathetic gradationalism. Previous research has shown that the VMPFC is crucial for not only moral evaluations but also pleasant and positively evaluated stimuli (Greene et al. 2001; Kringelbach and Berridge 2009; Moll et al. 2001, 2002). Therefore, the involvement of the VMPFC in racial evaluations as revealed by my dissertation supports the overall moral apathy and the sympathetic gradationalism arguments. Put simply, members of in-groups are analyzed with mental systems that include moral emotions that are high in approach and low in avoidance, while out-groups are evaluated with a wider range of emotions.

Results from experiments 2 and 3 support sympathetic gradationalism, although Experiment 1 fails to support it. The discrepancy between these results might be due to one of the assumptions of the theory that sympathetic gradationalism relies on mostly non-conscious processes. Middle class members are perceived as the societal norm and the reference group that is the most highly valued (Fiske et al. 2002). Therefore, apathy towards black middle class members cannot be overtly rationalized creating an increasing social pressure on people's feelings and thoughts about middle class blacks. Therefore, social pressure might be a potential reason why the first experiment did not support the sympathetic gradationalism prediction, while the other two experiments offered partial support.

Additionally, these findings also point to important clues as to the social evolution of racial bias. One of the most commonly shared assumptions of contemporary theories of race and racism are that racism relies on the automatic categorization of persons into racial categories (e.g., Dovidio et al. 2010; Fiske 2002). Perhaps the most important perspective (also implicit in many influential social psychological theories like Expectation States Theory and Social Identity Theory, Ridgeway and Zelditch 2002; Berger and Webster 2006; Tajfel and Turner, 1985) about why automatic racial categorization occurs is the evolved cognitive capacity for categorical thinking. In this view, humans categorize everything (objects, animals etc.) into groups or natural types based on perceived similarities (Hirschfeld 1996; GilWhite 2001; Rothbart and Taylor 1992) because of its adaptive nature for group survival.

However, an alternative view proposes that racial categorization and encoding is the byproduct of an essentially moral capacity: coalition building (Kurzban, Tooby, and Cosmides 2001; Cosmides, Tooby, and Kurzban 2003). In this view, humans rely on physical cues (bodily appearance) to track others' social and political allegiances. Race has become one such perceptual cue for detecting alliances under historical conditions that created racially un-egalitarian societies (Kurzban, Tooby, and Cosmides 2001;

Cosmides, Tooby, and Kurzban 2003). Findings from my dissertation support this latter view that racial evaluations are intertwined with moral appraisals. It is one thing to categorize people and objects into being a threat; it is another, an aspect of human sociality, to additionally categorize them into being potential allies. Observing that the key brain regions involved in processing/regulating socially and morally salient information are also involved in racial boundary making might indeed buttress the assumption that racial categorization is the consequence of a cognitive system evolved to track coalition memberships and negotiate complicated social landscapes.

Blended Racism: Social Class Modulates Racial Evaluations

The patterns in behavioral reports of adults with no brain damage (Experiment 1) as well as those with damage (Experiment 2) and brain activation patterns revealed from the functional Magnetic Resonance imaging (Experiment 3) largely support blended racism arguments by indicating a dissociation of racial evaluative differences between those in the middle class groups and those in other class groups. Results reveal that evaluative differences in upper and lower class groups mainly rely on emotions that are high on avoidance or low in approach like envy and pity. There are more differences between the emotional reports towards upper class whites and blacks than lower and middle class (Experiment 1). Overall moral emotions were evoked by upper class whites more than upper class blacks.

There were also a multitude of other interesting basic emotional distinctions. Results reflect an overall discontent with the upper class whites more than upper class blacks. White respondents indicated feeling more anger, pity, sadness, fear, disgust and envy but also less happiness towards the white upper class. The frustration and disapproval of the very rich is not surprising considering research has also demonstrated hostile feelings towards the rich (Fiske 2011) and the recent nation-wide Occupy

movements criticizing the top one percent of the American socioeconomic distribution. However, taking into account that several of the respondents also indicated during the debriefing session that they were repulsed by the pictures of rich people, it is interesting that the frustration with black upper class is not as strong as that of white upper class members. I argue that these results reflect a more general apathy towards the upper class blacks beyond moral apathy. This may be due to a status downgrading process whereby the upper class blacks are not seen as high in status as the upper class whites, and they are also not seen as much of a threat. Due to the meritocratic ideal, high status people in American society are accepted as highly competitive and competent. If upper class blacks are facing status downgrading and a general apathy, this might prove very problematic for the legitimacy of blacks in powerful social positions. Regardless of the cause, this result diverges from what some prominent theories of racism in America would suggest (Wilson 1987, 1996 and 2009).

Additionally, results from Experiment 3 show that the amygdala is particularly involved in racial evaluation differences for those in the lower class groups. The amygdala is a key region in aversive conditioning and emotions (Adolphs, Tranel, and Damasio 1998; Dalgleish 2004; LeDoux 2000). Previous research shows that individuals with the amygdala lesions have impaired startle reflex, impaired recognition of emotional face expressions (especially fear) and social judgments like detecting trustworthiness of others (Adolphs et al. 1994, 1998; Angrilli et al. 1996; Boucsein et al. 2000). Therefore, greater amygdala activation in response to black vs. white lower class people might indicate a more aversive disposition against poor blacks. This suggests that blended racism operates differently for people of lower status, especially those coded as racial out-group. Coupled with feeling less pity towards black poor than white (Experiment 1 results), this aversive bias might manifest itself in emotional and behavioral distancing from the black poor giving them an additional disadvantage to encounter over and above belonging to a racial minority category. This view would also explain why various

studies show that employers for entry-level jobs are prejudiced against inner-city blacks that are coming from lower socio-economic positions (Moss and Tilly 1996; Neckerman and Kirschenman 1991; Shih 2002).

Perhaps, what contributes to the greater aversion towards poor blacks the most are the negative media portrayals and/or the invisibility in the media as well as residential segregation of the urban poor. Unfortunately, aversion to the poor also carries over to social psychology where evaluations of the poor are largely ignored (see Lott 2002 for a treatise). My dissertation demonstrates that out-group class members are evaluated with a mixture of moral emotions that include high avoidance and/or low approach. I contribute to this literature by unraveling some of the nuances of racial evaluations across class groups. Even individuals explicitly holding racially egalitarian values and ideologies seem to be non-consciously affected by cultural stereotypes, and process information from certain groups less charitably than those groups they feel they are a part of.

Emotional Differences between Social Class Groups Are More Persistent and Intense Than Those across Racial Groups

My analyses reveal that emotional differences between social class groups are more blatant and stronger than those across racial groups. The differences between social class groups are evident in both primary and moral emotions. Moreover, in most cases, emotional differences between class conditions are larger than those between humans and non-humans. Results reveal that while middle class people are more frequently attributed with emotions that are high on approach (like pride and happiness), poor people are mostly evaluated with emotions that are low in approach and avoidance (like pity), and the rich are more likely to be evaluated with those that are high in avoidance and approach (like envy). However, another interesting outcome is that a wider range of emotions is reported toward upper and lower class members. For example, disgust,

sadness and anger (in addition to happiness, pride and envy) are also more likely to be attributed to upper class people vs. middle. Combined with the results regarding racial differences within class groups, these findings suggest that while middle class Americans are the most favored social class group, lower and upper class groups face a blended ambivalent class bias. A combination of high approach and low avoidance, a blend of negative and positively valenced emotions are directed towards upper and lower class groups. This ambiguous nature of classism might prove more difficult to overcome as it involves both negative and positive feelings and attitudes and is not easily characterized as prejudice.

Limitations and Future Research

An important implication of this study is that attitudes towards certain groups are very much dependent on the intersection of various factors that are typically studied in isolation in social neurology as well as sociology. Accordingly, racial attitudes are not monolithic, and scholars should take better account of the social location and context of the objects of these attitudes when trying to understand how they influence social life. My results reveal social class as an important factor contextualizing racial evaluations. However, one of the main limitations of this study is that it cannot distinguish between social identity vs. social class effects due to the sampling structure. The sample used here also included mainly middle and working class white individuals. Therefore, it is not possible to identify whether or not the emotional reactions given to upper or lower class groups were due to in-group identification or class bias. Future research should take into account the nuances within the social class conditions and isolate the effects of class vs. identity by extending the inquiry to evaluations of other class groups including working class and upper middle class groups, given the vast sociological literature on these subtle differences.

Additionally, the sample for the present study comprised of a total of sixty six participants recruited from Iowa City and surrounding areas. This sample is only a very small proportion and not representative of the general population of white Americans. Therefore, in order to be able to generalize the study results to the general population, further research is required with larger and more representative samples. Moreover, in order to understand ideological dispersion of racism and how it varies by racial group membership, future studies should collect emotional evaluations of other racial groups as well.

Reaction time is a dominant technique of measurement for implicit bias in the social scientific and psychological literature. However, my research revealed no reaction time differences between racial categories, and longer reaction times for the emotions that were rated the most strongly for class comparisons. Perhaps these results indicate that my measures failed to capture implicit racial bias, but they might also mean that the reaction time technique fails to capture certain aspects of emotion and cognition. Due to the current focus on implicit and automatic bias, other cognitive capacities like self-referential processing and cognitive perspective taking that might be slower but still influential in racial bias are under-considered. However, these results might also be interpreted as supporting the claim that class bias is more blatant and relies on a slow and conscious mental process. Therefore, class differences in reaction times were revealed. Future research and theories should investigate the conscious mental mechanisms that are important in class bias, and bring a better definition to the concept of implicit bias and find different measurement techniques other than reaction time. This would help us better understand the relationship between implicit and explicit bias as well as the nature of contemporary race and class bias.

Finally, while this research adopted a multi-method approach in order to minimize the false positives and bring a stronger test of the hypotheses, the neuroscientific techniques employed here are new to sociology and their limitations and capabilities

should be understood clearly for a proper and powerful use. Neuropsychological studies recruiting patients with brain damage are vulnerable due to the potential heterogeneity of the patients such that it is difficult to keep the lesion location and size as well as patient characteristics and history homogenous. Functional neuroimaging studies, on the other hand, can better control for the subject characteristics yet are strictly correlational. Functional imaging method assumes that cerebral blood flow and neuronal activity are correlated; thus, instead of measuring direct neuronal activity, it measures the change between oxygenated and deoxygenated blood by relying on the magnetic properties of the blood. Therefore, causal claims relying on both lesion and functional imaging techniques should be cautioned. Furthermore, it is important to note that results from both of these techniques can only be interpreted in relation to the preexistent literature on the anatomy and functions of brain regions and by coupling these methods with carefully designed behavioral and attitudinal measures.

Conclusion

This dissertation is an initial attempt to outline a theory of American racism that is grounded in the emotional moral boundaries of race and addresses the ongoing issue of structural racism within a country that reports a lessening of overt racial prejudicial attitudes over time (see Pager and Shepherd 2008). Surprisingly, work on prejudice overwhelmingly focuses on cognitive schemas or implicit reactions, and little attention has been paid to the role of our emotional systems in framing and perpetuating prejudice. Additionally, the moral dimension is only partly covered in theories approaching these issues, and even well-studied theories of racial prejudice emphasizing its moral aspects fail to explicate the emotional mechanisms. This dissertation proposes a theory uncovering these emotional mechanisms by identifying the brain regions involved in racial attitudes developed within the American social context, thus suggesting how distal social forces become a part of the human mind. Ideally, this theory builds on literature

that can benefit society by refining our knowledge of the constituent parts to eliminate an important contributor to racial inequality: racial prejudice. By demonstrating the importance of emotions in racial prejudice, we can contribute to the development of future intervention strategies to overcome individual-level biases that develop even within post-racial, well-meaning individuals.

While the notion that sociological and neurological theories 'can' and 'should' inform each other and therefore a call and emphasis on the dialogue between these two sciences is a growing focus in sociology (e.g. Cerulo 2010; Cook and Harkness 2010; Franks 2013; Ignatow 2007), detailed accounts of how to accomplish this task are lacking in neurological expertise. In addition to its substantive findings, this study illustrates a model for how sociologists and neuroscientists investigating racial attitudes can complement each other's work. Looking at the bodily and neural mechanisms for social and moral emotions, we will be able to draw links between macro-level social phenomena (such as racial inequality) and individual functioning (see Firat and McPherson 2010), including how individuals may create, perpetuate or justify these social phenomena (Howard and Renfrow 2003). As decades of sociological study of emotions have taught us, cultural forces shape individual experiences. However, it is only with the relatively new field of neurosociology that we can begin to observe and better understand what happens within the individual as a result of these social factors, and that mind, self, and society (Mead 1934) are fundamentally intertwined.

APPENDIX

Table A-1 Selection criteria

Screening questions for the pictorial vignette experiment:
1) Are you Caucasian? **(NO excludes)**
2) Are you a native English speaker? **(NO excludes)**
3) Are you at least 30 years of age? **(NO excludes)**
4) What is highest grade or year of regular school that you completed? **(Exclude if below 10th grade)**
5) Is your annual household income between $12,000 and $140,000? **(NO excludes)**
6) Have you ever consulted or been under the care of a neurologist, psychologist, or psychiatrist in adult life? **(If YES, please answer the questions below. YES to any of the questions below excludes. If NO, skip to question 7)**
6a) Do you have any of the following neurological conditions: **(YES to any excludes)** stroke, severe head trauma (motor vehicle accident, loss of consciousness, alteration of consciousness or memory loss), tumor, meningitis, encephalitis, seizure disorder, severe migraine, dementia, any other neurological condition which may contribute to cognitive impairment
6b) Do you have any developmental disabilities, for example, dyslexia or a learning disability **(YES to any excludes)**
6c) Do you have any history of depression or any psychiatric disease? **(YES excludes)**
7) Do you have any of the following medical conditions **(YES to any excludes)**: severe hypertension, severe thyroid dysfunction, severe anemia and/or sickle cell disease, renal failure, heart disease, diabetes
8) Do you take any medications? **(If YES, please provide the medication name, dosage, and duration of usage)**
9) Do you have a history of drug or alcohol abuse? **(YES excludes)**
10) Are you an employee of the Neurology Department or a medical student rotating in Neurology? **(YES excludes)**
Additional screening questions for fMRI experiment:
11) Are you pregnant (or trying to become pregnant)? **(YES excludes)**
12) Are you breastfeeding? **(YES excludes)**
13) Do you have any of the following in your body: **(YES to any excludes)** pacemaker, defibrillator, deep brain or nerve stimulator, bullets, shrapnel, metal slivers.

Figure A.1 Sample pictures for the middle class conditions.

Figure A.2 Sample pictures for the upper class conditions.

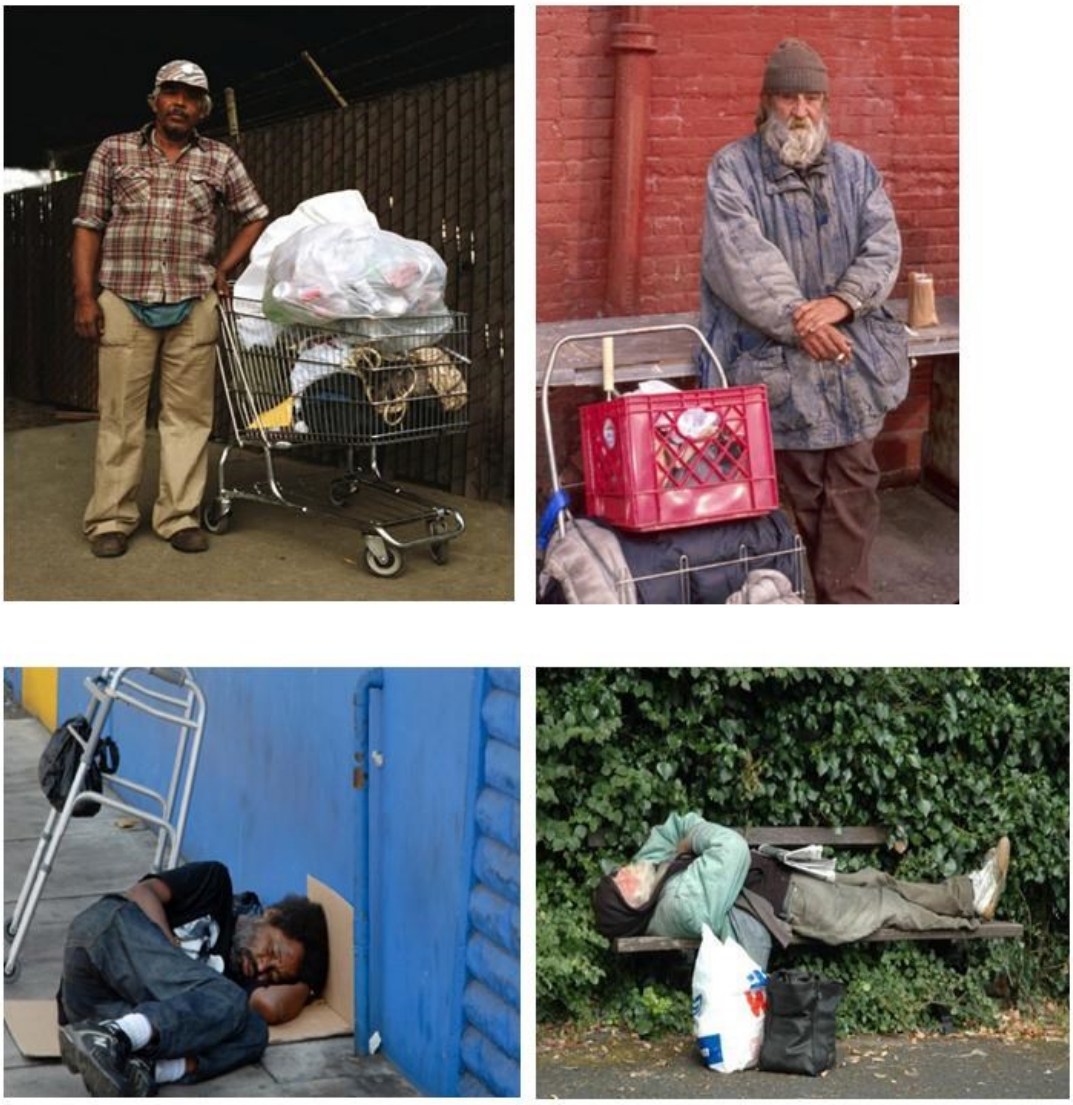

Figure A.3 Sample pictures for the lower class conditions.

Unpleasant Non-Human:

Figure A.4 Sample pictures for the non-human conditions.

Table A-2 Demographics questionnaire

AGE: _____

GENDER: _____ MALE _____ FEMALE

HIGHEST EDUCATION GRADE ATTENDED: _____

ETHNIC CATEGORY (If multi-racial check all that apply):

_____ American Indian/Alaskan Native
_____ Asian
_____ Black or African American
_____ Hispanic or Latino
_____ Native Hawaiian or Other Pacific Islander
_____ White
_____ More than one race
_____ Unknown or not reported

MARITAL STATUS

_____ Single
_____ Married
_____ Separated/Divorced
_____ Widowed

If you were asked to use one of below four names for your social class, which would you say you belong in?

_____ Lower class
_____ Working class
_____ Middle class
_____ Upper class

Table A-3 PANAS

Indicate to what extent you feel this way right now, that is, at the present moment.

very slightly, not at all
a little
moderately
quite a bit
extremely

Irritable
Interested
Determined
Hostile
Upset
Nervous
Distressed
Inspired
Attentive
Ashamed
Alert
Scared
Guilty
Enthusiastic
Active
Proud
Excited
Jittery
Afraid
Strong

Table A-4 Handedness questionnaire

	Always Left	Usually Left	No Pre-ference	Usually Right	Always Right
1. To write a letter legibly	( )	( )	( )	( )	( )
2. To throw a ball or hit a target	( )	( )	( )	( )	( )
3. To play a game requiring the use of a racquet	( )	( )	( )	( )	( )
4. At the top of a broom to sweep dust from the floor	( )	( )	( )	( )	( )
5. At the top of a shovel to move sand	( )	( )	( )	( )	( )
6. To hold a match when striking it	( )	( )	( )	( )	( )
7. To hold scissors to cut paper	( )	( )	( )	( )	( )
8. To hold thread to guide through the eye of a needle	( )	( )	( )	( )	( )
9. To deal playing cards	( )	( )	( )	( )	( )
10. To hammer a nail into wood	( )	( )	( )	( )	( )
11. To hold a toothbrush while cleaning your teeth	( )	( )	( )	( )	( )
12. To unscrew the lid of a jar	( )	( )	( )	( )	( )
13. Is your mother left-handed? Y N					
14. Is your father left-handed? Y N					
15. How many siblings do you have?					
Male _____ # left-handed _____					
Female _____ # left-handed _____					

Table A-5 Stereotype assessment

Below you will find a list of adjectives. Please read through the list carefully and identify those adjectives that make up the cultural stereotype of Blacks. Note, these characteristics may or may not reflect your personal beliefs. So, select those adjectives that you know to be part of the cultural stereotype whether or not you believe the stereotype to be true.

Lazy ____	Hostile ____
Rhythmic ____	Intelligent ____
Ignorant ____	Uneducated ____
Low in intelligence ____	Kind ____
Musical ____	Sexually perverse ____
Poor ____	Sportsmanlike ____
Stupid ____	Straightforward ____
Unreliable ____	Sensitive ____
Aggressive ____	Artistic ____
Rude ____	Criminal ____
Loud ____	Loyal to family ____
Athletic ____	Honest ____

Table A-6 Symbolic racism scale

In this part of the experiment, you will be asked your personal opinion on various issues.

1. It's really a matter of some people not trying hard enough; if blacks would only try harder they could be just as well off as whites. Please rate your agreement with the statement.

1 Strongly agree
2 Somewhat agree
3 Somewhat disagree
4 Strongly disagree

2. Irish, Italian, Jewish, and many other minorities overcame prejudice and worked their way up. Blacks should do the same. Please rate your agreement with the statement.

1 Strongly agree
2 Somewhat agree
3 Somewhat disagree
4 Strongly disagree

3. Some say that black leaders have been trying to push too fast. Others feel that they haven't pushed fast enough. What do you think?

1 trying to push too fast
2 going too slowly
3 moving at about the right speed

4. How much of the racial tension that exists in the United States today do you think blacks are responsible for creating?

1 all of it
2 most
3 some
4 not much at all

5. How much discrimination against blacks do you feel there is in the United States today, limiting their chances to get ahead?

1 a lot
2 some
3 just a little
4 none at all

Table A-6 Continued

6. Generations of slavery and discrimination have created conditions that make it difficult for blacks to work their way out of the lower class. Please rate your agreement with the statement.

1 Strongly agree

2 Somewhat agree

3 Somewhat disagree

4 Strongly disagree

7. Over the past few years, blacks have gotten less than they deserve. Please rate your agreement with the statement.

1 Strongly agree

2 Somewhat agree

3 Somewhat disagree

4 Strongly disagree

8. Over the past few years, blacks have gotten more economically than they deserve. Please rate your agreement with the statement.

1 Strongly agree

2 Somewhat agree

3 Somewhat disagree

4 Strongly disagree

Table A-7 Racial contact questionnaire

Please list all of your black friends (and/or acquaintances) below (by putting their initials) and rate how well you know them by putting an X under the appropriate number.

	know/knew as only an acquaintance						*know/knew very well*
Initials	1	2	3	4	5	6	7

Table A-8 Exit questionnaire

Please answer the questions below about your participation in this experiment.

1. Did you enjoy participating in this experiment?

2. How long did the experiment seem to take?

3. Were you bored?

4. What did you think was the purpose of the experiment?

5. Did you suspect that you were being deceived? (If so, during what part of the experiment?)

Table A-9 Debriefing statement

We appreciate your participation in our study, and thank you for spending the time helping us with our research. Before you go, we would like to give you some more information about this research. First, we would like to remind you that your data will be labeled with a code number, instead of your name, in order to keep your responses confidential. We also want to inform you that today we had to withhold some information about the real purpose of this study.

When you arrived here today, you were told that the purpose of this study was to investigate how the brain helps people give emotional responses to pictures. During your participation you were asked to rate various pictures of people in different social context (meaning different situations such as homeless people on the street) and various animals, objects or plants. Although we were indeed investigating people's emotional responses to pictures, the study was more complicated than we explained to you when you arrived.

We could not give you complete information about the study at that time because it may have influenced your behavior during the study in a way that would make investigations of the research question invalid. We apologize for the omissions, and hope that you understand the need for it once the purpose of the study has been fully explained to you. Before I tell you about all the goals of this study, however, I want to explain why it is necessary in some kinds of studies to not tell people all about the purpose of the study before they begin. Discovering how people would naturally react is what we are really trying to find out in experiments. We don't always tell people everything at the beginning of a study because we do not want to influence your responses. If we tell people what the purpose of the experiment is and what we predict about how they will react, then their reactions would not be a good indication of how they would react in everyday situations. Now, I would like to explain exactly what we were trying to study in this investigation.

We were interested in the differences in people's evaluations of own race vs. other race group members in different social context. Studies on racial attitudes show that people give different evaluations to out-group race members versus in-group race members (Hart et al. 2000; Xu et al. 2009). However, most of these studies do not take into account the contextual information within which racial interaction occurs. Yet, daily interaction with different people including people from different races does not happen in isolation. Factors such as gender, age, social position (meaning characteristics such as social class, occupation etc.) of the people we interact with have an impact on our attitudes. Therefore, in our study we manipulated the social context of the pictures presented to you (socially desirable vs. non-desirable; i.e. desirable: rich people, non-desirable: homeless people). We expected to find a difference between evaluations of racial in-group and out-group members (favoring one's own racial group), however we expect this difference to be greater in more socially desirable context (such as middle-class people) and smaller in less socially desirable context (such as homeless people).

As you can now see, the reason that we have not completely informed you about the purpose of this study in the beginning was because we wanted to investigate how people evaluate different racial group members. We could not tell you that this study was about racial attitudes because we expected that people may respond differently if they knew specifically what we were interested in. We apologize for this, but we hope you can understand why it was necessary. We would not have been able to investigate this research question without withholding information about the real purpose of the study.

Table A-9 Continued

Right to withdraw data

Now that you are fully informed about the nature of this study, if you would not like your data to be used in this study you may withdraw your data from the research. You may decide to withdraw your data now by telling me you would like your data withdrawn, or you may withdraw your data by contacting us at a later time. However once we have used the data in our analyses or published our results, we will be unable to remove your data so you should let us know as soon as possible if you have changed your mind about participation. Whether or not you withdraw your data will not affect your current or future relations with the University of Iowa, the University of Iowa Hospitals and Clinics, the Department of Neurology, the Division of Behavioral Neurology and Cognitive Neuroscience, or Dr. Daniel Tranel.

Contact information

If you have any questions about this study, please feel free to ask. If you have any questions later, you may contact Rengin Firat at (319) 335-2861, or you may contact the faculty supervisor of this study, Dr. Daniel Tranel, at (319) 384-6050.

Thank you!

We greatly appreciate your willingness to participate in our research. Your participation in today's study has been extremely helpful. To help make the study successful though, we need for people not to know the exact nature of our study. So, we ask, as a further way to help our research, that you not discuss the details of this study with anyone for a few weeks. This gives us an opportunity to conduct our research using naïve participants.

Table A-10 Likelihood ratio comparisons

	Emotion Intensity				
	Log restricted-likelihoods			**Likelihood Ratio (LR) Chi-Square test**	
	Model 1	***Model 2***	***Model 3***	***Model 1 vs. 2***	***Model 2 vs. 3***
Angry	-7969.01	-7126.53	-7844.03	1684.97 (p-value=0.00)	-1435.01 (p-value=1.0)
Happy	-9552.84	-8969.42	-9530.51	1166.83 (p-value=0.00)	-1122.18 (p-value=1.0)
Sad	-8432.42	-7609.2	-8302.52	1646.45 (p-value=0.00)	-1386.65 (p-value=1.0)
Envy	-8370.46	-7801.19	-8360.53	1138.53 (p-value=0.00)	-1118.66 (p-value=1.0)
Fear	-7138.94	-6403.47	-6988.65	1470.94 (p-value=0.00)	-1170.35 (p-value=1.0)
Pity	-8131.57	-7299.9	-7972.82	1663.34 (p-value=0.00)	-1345.83 (p-value=1.0)
Pride	-8571.17	-7837.28	-8560.2	1467.77 (p-value=0.00)	-1445.84 (p-value=1.0)
Disgust	-9145.78	-8386.19	-9034.72	1519.18 (p-value=0.00)	-1297.06 (p-value=1.0)
	Reaction Time				
	Log restricted-likelihoods			**the Likelihood Ratio (LR) Chi-Square test**	
	Model 1	***Model 2***	***Model 3***	***Model 1 vs. 2***	***Model 2 vs. 3***
Angry	-5040.83	-4973.35	-5034.99	134.97 (p-value=0.00)	-123.30 (p-value=1.0)
Happy	-5365.14	-5276.33	-5361.76	177.61 (p-value=0.00)	-170.86 (p-value=1.0)
Sad	-4921.83	-4822.14	-4906.29	199.37 (p-value=0.00)	-168.29 (p-value=1.0)
Envy	-5083.99	-4987.44	-5078.09	193.09 (p-value=0.00)	-181.30 (p-value=1.0)
Fear	-4886.92	-4831.31	-4872.97	111.21 (p-value=0.00)	-83.31 (p-value=1.0)
Pity	-4832.64	-4748.12	-4819.48	169.03 (p-value=0.00)	-142.72 (p-value=1.0)
Pride	-5319.89	-5220.7	-5316.77	198.40 (p-value=0.00)	-192.14 (p-value=1.0)
Disgust	-4997.71	-4923.61	-4988.24	148.20 (p-value=0.00)	-129.25 (p-value=1.0)

Note 1: Model 1: One random intercept (subjects).

Note 2: Model 2: Two random intercepts (subjects and conditions nested in subjects).

Note 3: Model 3: Random intercept and random slope model (subjects are random intercept, conditions are random slopes), covariance unstructured.

Table A-11 Residual diagnostics

	Occasions		Condition nested in subjects		Subjects	
	Level 1		Level 2		Level 3	
Emotion Intensity						
	Skewness	Kurtosis	Skewness	Kurtosis	Skewness	Kurtosis
ANGRY	1.9	13.8	2.4	14.2	1.1	3.2
HAPPY	-.02	5.9	-.01	3.0	.6	2.8
SAD	.9	11.6	.6	7.5	.18	2.2
ENVY	1.3	10	1.5	9.2	1.9	6.4
FEAR	.43	15	.1	8	.9	3.3
PITY	.7	12.2	.5	7.7	.1	2.1
PRIDE	.6	9.3	.3	4.1	1.2	3.2
DISGUST	1	7.8	1.6	8.7	.8	2.5
	Occasions		Condition nested in subjects		Subjects	
	Level 1		Level 2		Level 3	
Reaction Time						
ANGRY	.4	3.9	-.4	3.8	-.7	3.2
HAPPY	.4	4.5	-.4	4.7	-.8	3.9
SAD	.3	3.7	.1	6.8	-.9	3.7
ENVY	.3	3.6	-.4	5.2	-1.1	3.7
FEAR	.3	3.9	-.4	4.3	-.8	3.3
PITY	.2	3.8	.2	7.7	-1.2	4.4
PRIDE	.2	3.7	-.5	4.8	-.9	3.4
DISGUST	.4	4.0	.06	4.3	-.7	3.1

Note: Previous literature suggest that kurtosis values greater than seven and skewness values greater than two produce inaccurate standard errors and t-statistics (Curran, West, & Finch 1996, Chou and Bentler 1995 recommend concern if skewness > 2 and kurtosis > 7).

Table A-12 Means and proportions of the outcome variables

The proportions of reporting 'yes' for each emotion								
	Angry	**Happy**	**Sad**	**Fear**	**Pity**	**Pride**	**Envy**	**Disgust**
BL	0.34	0.03	0.72	0.16	0.7	0.03	0.01	0.41
s.d.	0.5	0.2	0.4	0.4	0.5	0.2	0.1	0.5
BM	0	0.79	0.01	0	0.01	0.39	0.25	0.01
s.d.	0.1	0.4	0.1	0	0.1	0.5	0.4	0.1
BU	0.03	0.49	0.03	0.02	0.04	0.22	0.28	0.07
s.d.	0.2	0.5	0.2	0.1	0.2	0.4	0.4	0.3
WL	0.38	0.01	0.74	0.17	0.74	0.01	0.01	0.44
s.d.	0.5	0.1	0.4	0.4	0.4	0.1	0.1	0.5
WM	0.01	0.76	0.02	0.01	0.02	0.36	0.3	0.03
s.d.	0.1	0.4	0.1	0.1	0.1	0.5	0.5	0.2
WU	0.08	0.43	0.06	0.04	0.06	0.21	0.34	0.13
s.d.	0.3	0.5	0.2	0.2	0.2	0.4	0.5	0.3
NP	0.01	0.82	0.02	0.01	0.02	0.16	0.15	0.02
s.d.	0.1	0.4	0.2	0.1	0.1	0.4	0.4	0.1
NUP	0.22	0.04	0.2	0.62	0.09	0.02	0	0.44
s.d.	0.4	0.2	0.4	0.5	0.3	0.1	0.1	0.5
Mean Emotion Intensity Ratings								
	Angry	**Happy**	**Sad**	**Fear**	**Pity**	**Pride**	**Envy**	**Disgust**
BL	0.91	0.07	2.17	0.3	2.09	0.05	0.02	1.13
s.d.	1.5	0.4	1.8	0.8	1.8	0.3	0.2	1.7
BM	0.01	2.4	0.01	0	0.01	1.13	0.65	0.02
s.d.	0.1	1.6	0.1	0	0.2	1.7	1.3	0.3
BU	0.07	1.36	0.06	0.03	0.07	0.64	0.65	0.14
s.d.	0.4	1.6	0.4	0.2	0.4	1.4	1.3	0.6
WL	1.03	0.02	2.29	0.32	2.26	0.02	0.01	1.24
s.d.	1.6	0.2	1.8	0.8	1.7	0.2	0.2	1.7
WM	0.02	2.29	0.03	0.02	0.03	1.11	0.8	0.05
s.d.	0.2	1.7	0.2	0.2	0.3	1.7	1.5	0.3
WU	0.15	1.18	0.11	0.07	0.12	0.63	0.86	0.28
s.d.	0.6	1.6	0.5	0.4	0.6	1.4	1.5	0.8
NP	0.01	2.57	0.05	0.02	0.03	0.47	0.41	0.02
s.d.	0.1	1.7	0.4	0.3	0.3	1.2	1.1	0.2
NUP	0.64	0.08	0.57	2.06	0.27	0.05	0	1.57
s.d.	1.4	0.5	1.3	2	0.9	0.4	0.1	2
Mean Reaction Times								
	Angry	**Happy**	**Sad**	**Fear**	**Pity**	**Pride**	**Envy**	**Disgust**
BL	1767.38	1453.88	1676.33	1581.3	1680.08	1358.25	1313.63	1738.58
s.d.	1189.1	1415.5	1023.6	1012.6	987.4	972.3	850.8	1132.9
BM	1172.29	1435.37	1167.43	1140.03	1167.81	1638.34	1599.16	1154.33
s.d.	783.7	1043.7	773.8	745.2	746.4	1110.5	1070.3	821.4

Table A-12 Continued

BU	1219.3	1608.83	1228.03	1178.75	1182.41	1651.1	1530.87	1237.72
s.d.	878.5	1266.6	828	805.1	755.9	1216.1	1011.6	928.8
WL	1768.32	1394.11	1615.03	1559.62	1652.42	1341.57	1267.68	1690.75
s.d.	1164.6	1189	976	1009	957.9	953.6	800.2	1171.1
WM	1180.99	1585.44	1201.18	1210.61	1211.54	1695.99	1658.62	1169.52
s.d.	756.8	1186.8	828.1	810.7	786.7	1120.5	1104.6	807.5
WU	1290.12	1691.46	1279.69	1213.64	1290.32	1590.44	1534.27	1266.48
s.d.	928.3	1496.6	855.4	802.7	849	1194.7	1023.9	923.6
NP	1107.62	1514	1154.33	1105.84	1129.71	1470.09	1420.64	1123.1
s.d.	697.6	1136.3	753.2	707.3	712.2	997	931.1	703
NUP	1664.92	1377.52	1567.64	1620.65	1390.27	1296.98	1254.83	1516.83
s.d.	1068	1029	1013.1	968	897.4	888.1	831.6	969

Note: s.d.: standard deviation.

Table A-13 Logistic mixed-effects regression results: anger and fear

	ANGER					FEAR				
	1	2	3	4	5	1	2	3	4	5
BM		-5.40**	-5.40**	-5.43**	-5.43**		-5.71**	-5.70**	-5.74**	-5.73**
		0.59	*0.59*	*0.59*	*0.59*		*1.02*	*1.02*	*1.02*	*1.02*
WM		-3.15**	-3.15**	-3.36**	-3.36**		-2.88**	-2.87**	-2.98**	-2.97**
		0.23	*0.23*	*0.25*	*0.25*		*0.31*	*0.31*	*0.32*	*0.32*
WL		0.26*	0.26*	0.22	0.22		0.10	0.10	0.09	0.09
		0.13	*0.13*	*0.13*	*0.13*		*0.17*	*0.17*	*0.17*	*0.17*
WM		-4.27**	-4.27**	-4.31**	-4.30**		-4.06**	-4.06**	-4.09**	-4.08**
		0.36	*0.36*	*0.36*	*0.36*		*0.48*	*0.48*	*0.48*	*0.48*
WH		-2.25**	-2.25**	-2.38**	-2.38**		-2.14**	-2.14**	-2.16**	-2.15**
		0.18	*0.18*	*0.18*	*0.18*		*0.25*	*0.25*	*0.25*	*0.25*
NP		-5.10**	-5.10**	-5.14**	-5.13**		-3.87**	-3.86**	-4.09**	-4.08**
		0.52	*0.52*	*0.52*	*0.52*		*0.45*	*0.45*	*0.48*	*0.48*
NUP		-0.79**	-0.79**	-0.88**	-0.88**		3.28**	3.29**	3.33**	3.35**
		0.14	*0.14*	*0.14*	*0.14*		*0.18*	*0.18*	*0.18*	*0.18*
Age[a]			-0.01		-0.01			-0.03		-0.02
			0.02		*0.02*			*0.02*		*0.02*
Male			-1.03*		-1.3**			-1.83**		-1.73**
			0.53		*0.47*			*0.54*		*0.54*
Edu.[a]			-0.02		-0.09			-0.04		0.06
			0.13		*0.13*			*0.13*		*0.15*
Pos. Af[a]	.		0.05		0.10			0.13*		0.14*
			0.05		*0.06*			*0.06*		*0.07*
Neg. Af.[a]			0.11		0.11			-0.12		-0.11
			0.18		*0.17*			*0.18*		*0.19*

Table A-13 Continued

	ANGER					FEAR				
	1	2	3	4	5	1	2	3	4	5
Symbolic				-0.45	-2.06				0.44	-0.16
Racism[a]				*1.47*	*1.35*				*1.69*	*1.53*
Contact[a]				-0.05*	-0.04*				0.01	0.02
				0.02	*0.02*				*0.03*	*0.02*
Stereot.[a]				-0.05	-0.13				0.12	-0.01
				0.06	*0.07*				*0.07*	*0.07*
Level-2	0.35	0.80**	0.58*	0.69*	0.26	-0.20	1.10**	0.62*	0.97**	0.54
variance	*0.30*	*0.29*	*0.29*	*0.29*	*0.30*	*0.29*	*0.28*	*0.28*	*0.28*	*0.29*
Sigma_u	1.19	1.49	1.34	1.41	1.14	0.91	1.73	1.37	1.62	1.31
Rho	0.30	0.40	0.35	0.38	0.28	0.20	0.48	0.36	0.44	0.34

Note 1: ** $p < 0.01$, * $p < 0.05$.

Note 2: Standard errors are in *italics* below the coefficients.

Note 3: BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant.

Note 4: [a] Centered.

Note 5: Sample sizes: Model 1-3=30; Model 4-5= 29.

Table A-14 Logistic mixed-effects regression results: sadness and happiness

	SADNESS					HAPPINESS				
	1	2	3	4	5	1	2	3	4	5
BM		-6.16**	-6.16**	-6.23**	-6.23**		5.55**	5.55**	5.73**	5.72**
		0.36	*0.36*	*0.36*	*0.36*		*0.24*	*0.24*	*0.26*	*0.26*
WM		-5.18**	-5.19**	-5.40**	-5.40**		3.78**	3.78**	3.97**	3.97**
		0.24	*0.24*	*0.26*	*0.26*		*0.23*	*0.23*	*0.24*	*0.24*
WL		0.17	0.17	0.20	0.20		-1.32**	-1.32**	-1.1*	-1.1*
		0.14	*0.14*	*0.15*	*0.15*		*0.43*	*0.43*	*0.44*	*0.44*
WM		-5.56**	-5.57**	-5.63**	-5.6**		5.32**	5.32**	5.55**	5.54**
		0.28	*0.28*	*0.28*	*0.28*		*0.24*	*0.24*	*0.25*	*0.25*
WH		-4.43**	-4.43**	-4.62**	-4.63**		3.45**	3.45**	3.63**	3.63**
		0.19	*0.19*	*0.21*	*0.21*		*0.23*	*0.23*	*0.24*	*0.24*
NP		-5.44**	-5.44**	-5.51**	-5.51**		5.79**	5.80**	6.02**	6.02**
		0.27	*0.27*	*0.27*	*0.27*		*0.24*	*0.24*	*0.26*	*0.26*
NUP		-2.99**	-2.99**	-3.10**	-3.10**		0.08	0.08	0.23	0.23
		0.15	*0.15*	*0.15*	*0.15*		*0.29*	*0.29*	*0.30*	*0.30*
Age[a]			0.01		0.01			0.027*		0.04**
			0.02		*0.02*			*0.01*		*0.01*
Male			-1.44**		-1.39**			-0.56		-0.43
			0.42		*0.41*			*0.34*		*0.27*
Edu.[a]			0.05		0.01			-0.11		0.06
			0.10		*0.11*			*0.08*		*0.08*
Pos. Af[a]			0.09*		0.06			0.01		0.03
			0.04		*0.05*			*0.04*		*0.03*
Neg. Af.[a]			0.00		0.10			-0.27*		-0.32**
			0.14		*0.15*			*0.12*		*0.10*

Table A-14 Continued

	SADNESS					HAPPINESS				
	1	2	3	4	5	1	2	3	4	5
Symbolic Racism[a]				-1.18	-2.23				1.29	2.23**
				1.33	*1.17*				*1.16*	*0.78*
Contact[a]				0.01	0.01				0.00	-0.01
				0.02	*0.02*				*0.02*	*0.01*
Stereot.[a]				0.13*	0.06				0.00	-0.04
				0.06	*0.06*				*0.05*	*0.04*
Level-2 variance	-0.62	0.67*	0.14	0.49	-0.02	-1.06**	0.27	-0.31	0.23	-0.86**
	0.32	*0.29*	*0.29*	*0.29*	*0.30*	*0.28*	*0.27*	*0.28*	*0.28*	*0.30*
Sigma_u	0.73	1.40	1.07	1.28	0.99	0.59	1.14	0.86	1.12	0.65
Rho	0.14	0.37	0.26	0.33	0.23	0.10	0.28	0.18	0.28	0.11

Note 1: ** $p < 0.01$, * $p < 0.05$.

Note 2: Standard errors are in *italics* below the coefficients.

Note 3: BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant.

Note 4: [a] Centered.

Note 5: Sample sizes: Model 1-3=30; Model 4-5= 29.

Table A-15 Logistic mixed-effects regression results: pity and pride

	PITY					PRIDE				
	1	2	3	4	5	1	2	3	4	5
BM		-6.50**	-6.51**	-6.63**	-6.64**		4.02**	4.02**	4.02**	4.02**
		0.43	*0.43*	*0.43*	*0.43*		*0.25*	*0.25*	*0.27*	*0.27*
WM		-4.86**	-4.87**	-5.18**	-5.19**		2.72**	2.72**	2.90**	2.91**
		0.23	*0.23*	*0.25*	*0.25*		*0.25*	*0.25*	*0.27*	*0.27*
WL		0.22	0.22	0.20	0.20		-1.08*	-1.08*	-1.06*	-1.06*
		0.13	*0.13*	*0.14*	*0.14*		*0.42*	*0.42*	*0.45*	*0.45*
WM		-5.63**	-5.64**	-5.75**	-5.76**		3.82**	3.83**	3.99**	3.99**
		0.30	*0.30*	*0.30*	*0.30*		*0.25*	*0.25*	*0.27*	*0.27*
WH		-4.40**	-4.40**	-4.71**	-4.72**		2.63**	2.63**	2.81**	2.81**
		0.20	*0.20*	*0.22*	*0.22*		*0.25*	*0.25*	*0.27*	*0.27*
NP		-5.79**	-5.80**	-6.01**	-6.01**		2.18**	2.18**	2.27**	2.27**
		0.32	*0.32*	*0.33*	*0.33*		*0.25*	*0.25*	*0.27*	*0.27*
NUP		-3.86**	-3.86**	-4.02**	-4.02**		-0.49	-0.49	-0.33	-0.33
		0.17	*0.17*	*0.18*	*0.18*		*0.36*	*0.36*	*0.37*	*0.37*
Age[a]			0.01		0.01			0.01		0.01
			0.02		*0.02*			*0.03*		*0.03*
Male			-1.58**		-1.68**			-0.54		-0.56
			0.38		*0.37*			*0.72*		*0.73*
Edu.[a]			0.11		0.03			-0.20		-0.10
			0.09		*0.10*			*0.18*		*0.20*
Pos. Af[a]			0.05		0.05			0.16*		0.17
			0.04		*0.04*			*0.07*		*0.09*
Neg. Af.[a]			0.05		0.10			-0.51*		-0.65*
			0.13		*0.13*			*0.24*		*0.26*

Table A-15 Continued

	PITY					PRIDE				
	1	2	3	4	5	1	2	3	4	5
Symbolic				-1.29	-2.27*				3.16	3.74
Racism[a]				*1.28*	*1.04*				*2.26*	*2.09*
Contact[a]				0.02	0.02				0.01	0.01
				0.02	*0.01*				*0.03*	*0.03*
Stereot.[a]				0.09	0.03				0.11	-0.02
				0.05	*0.05*				*0.09*	*0.10*
Level-2	-1.04**	0.50	-0.12	0.41	-0.28	1.23**	1.57**	1.20**	1.54**	1.15**
variance	*0.31*	*0.28*	*0.29*	*0.29*	*0.30*	*0.30*	*0.29*	*0.30*	*0.30*	*0.30*
Sigma_u	0.60	1.28	0.94	1.23	0.87	1.85	2.19	1.83	2.16	1.78
Rho	0.10	0.33	0.21	0.31	0.19	0.51	0.59	0.50	0.59	0.49

Note 1: ** $p < 0.01$, * $p < 0.05$.

Note 2: Standard errors are in *italics* below the coefficients.

Note 3: BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant.

Note 4: [a] Centered.

Note 5: Sample sizes: Model 1-3=30; Model 4-5= 29.

Table A-16 Logistic mixed-effects regression results: envy and disgust

	ENVY					DISGUST				
	1	2	3	4	5	1	2	3	4	5
BM		3.92**	3.91**	3.87**	3.87**		-5.45**	-5.45**	-5.47**	-5.47**
		0.40	*0.40*	*0.40*	*0.40*		*0.51*	*0.51*	*0.51*	*0.51*
WM		4.07**	4.07**	4.08**	4.08**		-2.66**	-2.66**	-2.83**	-2.83**
		0.39	*0.39*	*0.40*	*0.40*		*0.18*	*0.18*	*0.19*	*0.19*
WL		-0.34	-0.34	-0.34	-0.34		0.16	0.16	0.16	0.16
		0.59	*0.59*	*0.59*	*0.59*		*0.12*	*0.12*	*0.13*	*0.13*
WM		4.24**	4.24**	4.21**	4.21**		-3.79**	-3.79**	-3.81**	-3.80**
		0.39	*0.39*	*0.40*	*0.40*		*0.25*	*0.25*	*0.25*	*0.25*
WH		4.43**	4.43**	4.44**	4.44**		-1.91**	-1.91**	-1.99**	-1.99**
		0.39	*0.39*	*0.39*	*0.39*		*0.15*	*0.15*	*0.15*	*0.15*
NP		3.14**	3.14**	3.14**	3.14**		-4.33**	-4.33**	-4.34**	-4.34**
		0.40	*0.40*	*0.40*	*0.40*		*0.31*	*0.31*	*0.31*	*0.31*
NUP		-1.27	-1.27	-1.27	-1.27		0.18	0.18	0.17	0.17
		0.81	*0.81*	*0.81*	*0.81*		*0.12*	*0.12*	*0.13*	*0.13*
Age[a]			-0.05*		-0.06**			-0.04		-0.04
			0.02		*0.02*			*0.02*		*0.02*
Male			-0.42		-0.59			-0.72		-0.86
			0.48		*0.45*			*0.47*		*0.45*
Edu.[a]			-0.05		0.00			0.01		0.02
			0.12		*0.13*			*0.12*		*0.13*
Pos. Af[a]			0.13*		0.20**			0.08		0.10
			0.05		*0.06*			*0.05*		*0.06*
Neg. Af.[a]			-0.15		-0.24			0.03		0.00
			0.16		*0.16*			*0.16*		*0.16*

Table A-16 Continued

	PITY					PRIDE				
	1	2	3	4	5	1	2	3	4	5
Symbolic				0.12	-0.02				1.09	0.43
Racism[a]				*1.51*	*1.34*				*1.36*	*1.30*
Contact[a]				-0.03	-0.01				-0.04*	-0.03
				0.02	*0.02*				*0.02*	*0.02*
Stereot.[a]				-0.01	-0.16*				0.01	-0.07
				0.06	*0.07*				*0.06*	*0.06*
Level-2	0.46	0.73*	0.41	0.69*	0.22	0.09	0.65*	0.37	0.53	0.22
variance	*0.30*	*0.29*	*0.29*	*0.30*	*0.30*	*0.29*	*0.28*	*0.28*	*0.28*	*0.29*
Sigma_u	1.26	1.44	1.23	1.41	1.12	1.05	1.38	1.20	1.31	1.12
Rho	0.32	0.39	0.31	0.38	0.27	0.25	0.37	0.31	0.34	0.27

Note 1: ** $p < 0.01$, * $p < 0.05$.

Note 2: Standard errors are in *italics* below the coefficients.

Note 3: BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant.

Note 4: [a] Centered.

Note 5: Sample sizes: Model 1-3=30; Model 4-5= 29.

Table A-17 Emotion intensity mixed-effects regression results: anger and fear

	ANGER					FEAR				
	1	2	3	4	5	1	2	3	4	5
BM		-0.90**	-0.90**	-0.90**	-0.90**		-0.30**	-0.30**	-0.31**	-0.31**
		0.20	*0.20*	*0.21*	*0.21*		*0.09*	*0.09*	*0.09*	*0.09*
WM		-0.84**	-0.84**	-0.87**	-0.87**		-0.27**	-0.27**	-0.29**	-0.29**
		0.20	*0.20*	*0.21*	*0.21*		*0.08*	*0.08*	*0.09*	*0.09*
WL		0.12*	0.12*	-0.87**	-0.87**		0.02	0.02	0.02	0.02
		0.05	*0.05*	*0.04*	*0.04*		*0.04*	*0.04*	*0.04*	*0.04*
WM		-0.89**	-0.89**	-0.89**	-0.89**		-0.29**	-0.29**	-0.30**	-0.30**
		0.20	*0.20*	*0.21*	*0.21*		*0.09*	*0.09*	*0.09*	*0.09*
WH		-0.76**	-0.76**	-0.79**	-0.79**		-0.23**	-0.23**	-0.24**	-0.24**
		0.21	*0.21*	*0.22*	*0.22*		*0.07*	*0.07*	*0.08*	*0.08*
NP		-0.90**	-0.90**	-0.90**	-0.90**		-0.28**	-0.28**	-0.29**	-0.29**
		0.20	*0.20*	*0.21*	*0.21*		*0.09*	*0.09*	*0.09*	*0.09*
NUP		-0.27	-0.27	-0.31	-0.31		1.78**	1.78**	1.82**	1.82**
		0.17	*0.17*	*0.17*	*0.17*		*0.20*	*0.20*	*0.20*	*0.20*
Age[a]			0.00		0.00			0.00		0.00
			0.01		*0.01*			*0.00*		*0.01*
Male			-0.06		-0.10			-0.25*		-0.24
			0.13		*0.12*			*0.10*		*0.13*
Edu.[a]			-0.02		-0.04			-0.02		-0.01
			0.04		*0.05*			*0.03*		*0.04*
Pos. Af[a]			0.00		0.00			0.02		0.02
			0.01		*0.02*			*0.01*		*0.02*
Neg. Af.[a]			0.05		0.05			-0.02		-0.02
			0.05		*0.06*			*0.04*		*0.05*

Table A-17 Continued

	ANGER					FEAR				
	1	2	3	4	5	1	2	3	4	5
Symbolic Racism[a]				0.25	-0.13				0.22	0.09
				0.32	*0.40*				*0.26*	*0.34*
Contact[a]				-0.01	-0.01				0.00	0.00
				0.00	*0.01*				*0.01*	*0.01*
Stereot.[a]				-0.01	-0.01				0.02	0.00
				0.01	*0.03*				*0.01*	*0.02*
Random Intercept Variance	0.06	0.08	0.09	0.07	0.07	0.00	0.05	0.03	0.05	0.04
Residual variance	0.56	0.56	0.56	0.50	0.50	0.44	0.44	0.44	0.46	0.46
Total Variance	1.10	0.94	0.95	0.87	0.87	1.12	0.70	0.68	0.70	0.69
rho	0.05	0.09	0.09	0.08	0.08	0.00	0.07	0.05	0.07	0.06

Note 1: ** $p < 0.01$, * $p < 0.05$.

Note 2: Standard errors are in *italics* below the coefficients.

Note 3: BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant.

Note 4: [a] Centered.

Note 5: Sample sizes: Model 1-3=30; Model 4-5= 29.

Table A-18 Emotion intensity mixed-effects regression results: sadness and happiness

	SADNES					HAPPINESS				
	1	2	3	4	5	1	2	3	4	5
BM		-2.15**	-2.15**	-2.15**	-2.15**		2.32**	2.32**	2.34**	2.34**
		0.23	*0.23*	*0.23*	*0.23*		*0.22*	*0.22*	*0.22*	*0.22*
WM		-2.11**	-2.11**	-2.12**	-2.12**		1.29**	1.29**	1.33**	1.33**
		0.23	*0.23*	*0.23*	*0.23*		*0.18*	*0.18*	*0.18*	*0.18*
WL		0.13	0.13	0.14	0.14		-0.06*	-0.06*	-0.04*	-0.04*
		0.07	*0.07*	*0.08*	*0.08*		*0.02*	*0.02*	*0.02*	*0.02*
WM		-2.14**	-2.14**	-2.14**	-2.14**		2.21**	2.21**	2.25**	2.25**
		0.23	*0.23*	*0.23*	*0.23*		*0.21*	*0.21*	*0.21*	*0.21*
WH		-2.05**	-2.05**	-2.08**	-2.08**		1.11**	1.11**	1.15**	1.15**
		0.23	*0.23*	*0.23*	*0.23*		*0.19*	*0.19*	*0.19*	*0.19*
NP		-2.11**	-2.11**	-2.11**	-2.11**		2.49**	2.49**	2.52**	2.52**
		0.22	*0.22*	*0.23*	*0.23*		*0.18*	*0.18*	*0.18*	*0.18*
NUP		-1.59**	-1.59**	-1.61**	-1.61**		0.00	0.00	0.02	0.02
		0.19	*0.19*	*0.20*	*0.20*		*0.02*	*0.02*	*0.02*	*0.02*
Age[a]			0.00		0.00			0.01		0.01
			0.01		*0.01*			*0.01*		*0.01*
Male			-0.28*		-0.29			0.04		0.05
			0.12		*0.16*			*0.22*		*0.23*
Edu.[a]			-0.05		-0.08			-0.12*		-0.06
			0.04		*0.05*			*0.05*		*0.07*
Pos. Af[a]			0.02		0.01			0.02		0.03
			0.02		*0.02*			*0.03*		*0.03*
Neg. Af.[a]			-0.02		-0.02			-0.13		-0.17*
			0.05		*0.06*			*0.07*		*0.08*

Table A-18 Continued

	SADNES					HAPPINESS				
	1	2	3	4	5	1	2	3	4	5
Symbolic				0.33	-0.03				1.25*	1.40*
Racism[a]				*0.31*	*0.46*				*0.52*	*0.57*
Contact[a]				0.00	0.00				0.00	0.00
				0.01	*0.01*				*0.01*	*0.01*
Stereot.[a]				0.02	0.01				0.00	-0.02
				0.02	*0.03*				*0.03*	*0.03*
Random Intercept Variance	0.00	0.09	0.06	0.10	0.07	0.17	0.31	0.20	0.31	0.15
Residual variance	0.66	0.66	0.66	0.60	0.60	1.05	1.05	1.05	1.00	1.00
Total Variance	1.93	1.09	1.07	1.05	1.03	2.79	1.75	1.64	1.70	1.55
rho	0.00	0.08	0.06	0.09	0.07	0.06	0.18	0.12	0.18	0.10

Note 1: ** $p < 0.01$, * $p < 0.05$.

Note 2: Standard errors are in *italics* below the coefficients.

Note 3: BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant.

Note 4: [a] Centered.

Note 5: Sample sizes: Model 1-3=30; Model 4-5= 29.

Table A-19 Emotion intensity mixed-effects regression results: pity and pride

	PITY					PRIDE				
	1	2	3	4	5	1	2	3	4	5
BM		-2.07**	-2.07**	-2.08**	-2.08**		1.09**	1.09**	1.09**	1.09**
		0.21	*0.21*	*0.23*	*0.23*		*0.22*	*0.22*	*0.23*	*0.23*
WM		-2.01**	-2.01**	-2.05**	-2.05**		0.59**	0.59**	0.61**	0.61**
		0.21	*0.21*	*0.23*	*0.23*		*0.17*	*0.17*	*0.17*	*0.17*
WL		0.17*	0.17*	0.15	0.15		-0.03	-0.03	-0.03	-0.03
		0.08	*0.08*	*0.08*	*0.08*		*0.02*	*0.02*	*0.02*	*0.02*
WM		-2.05**	-2.05**	-2.06**	-2.06**		1.06**	1.06**	1.05**	1.05**
		0.21	*0.21*	*0.23*	*0.23*		*0.22*	*0.22*	*0.24*	*0.24*
WH		-1.96**	-1.96**	-2.01**	-2.01**		0.58**	0.58**	0.60**	0.60**
		0.22	*0.22*	*0.23*	*0.23*		*0.16*	*0.16*	*0.17*	*0.17*
NP		-2.05**	-2.05**	-2.06**	-2.06**		0.42**	0.42**	0.41**	0.41**
		0.21	*0.21*	*0.23*	*0.23*		*0.14*	*0.14*	*0.15*	*0.15*
NUP		-1.82**	-1.82**	-1.84**	-1.84**		0	0	0.00	0.00
		0.19	*0.19*	*0.20*	*0.20*		*0.02*	*0.02*	*0.02*	*0.02*
Age[a]			0.00		0.00			0.00		0.00
			0.01		*0.01*			*0.01*		*0.01*
Male			-0.29**		-0.33*			0.06		0.06
			0.11		*0.15*			*0.23*		*0.28*
Edu.[a]			-0.02		-0.05			-0.12*		-0.09
			0.03		*0.05*			*0.05*		*0.07*
Pos. Af[a]			0.01		0.00			0.04		0.05
			0.02		*0.02*			*0.03*		*0.03*
Neg. Af.[a]			0.02		0.01			-0.18*		-0.21*
			0.04		*0.06*			*0.08*		*0.10*

Table A-19 Continued

	PITY					PRIDE				
	1	2	3	4	5	1	2	3	4	5
Symbolic Racism[a]				0.23	-0.11				0.75	0.86
				0.27	*0.39*				*0.64*	*0.74*
Contact[a]				0.00	0.00				0.00	0.00
				0.01	*0.01*				*0.01*	*0.01*
Stereot.[a]				0.01	0.01				0.02	-0.01
				0.01	*0.02*				*0.03*	*0.04*
Random Intercept Variance	0.00	0.07	0.05	0.08	0.05	0.32	0.34	0.27	0.38	0.30
Residual variance	0.60	0.60	0.60	0.54	0.54	0.71	0.71	0.71	0.68	0.68
Total Variance	1.79	0.98	0.96	0.94	0.91	1.56	1.39	1.32	1.40	1.32
rho	0.00	0.07	0.06	0.08	0.06	0.21	0.25	0.21	0.27	0.23

Note 1: ** $p < 0.01$, * $p < 0.05$.

Note 2: Standard errors are in *italics* below the coefficients.

Note 3: BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant.

Note 4: [a] Centered.

Note 5: Sample sizes: Model 1-3=30; Model 4-5= 29.

Table A-20 Emotion intensity mixed-effects regression results: envy and disgust

	ENVY					DISGUST				
	1	2	3	4	5	1	2	3	4	5
BM		0.63**	0.63**	0.61**	0.61**		-1.11**	-1.11**	-1.11**	-1.11**
		0.17	*0.17*	*0.18*	*0.18*		*0.24*	*0.24*	*0.25*	*0.25*
WM		0.63**	0.63**	0.65**	0.65**		-0.99**	-0.99**	-1.02**	-1.02**
		0.14	*0.14*	*0.14*	*0.14*		*0.25*	*0.25*	*0.25*	*0.25*
WL		0.00	0.00	0.00	0.00		0.11*	0.11*	0.11*	0.11*
		0.01	*0.01*	*0.01*	*0.01*		*0.05*	*0.05*	*0.05*	*0.05*
WM		0.78**	0.78**	0.78**	0.78**		-1.08**	-1.08**	-1.08**	-1.08**
		0.18	*0.18*	*0.19*	*0.19*		*0.24*	*0.24*	*0.24*	*0.24*
WH		0.84**	0.84**	0.86**	0.86**		-0.85**	-0.85**	-0.87**	-0.87**
		0.17	*0.17*	*0.17*	*0.17*		*0.25*	*0.25*	*0.25*	*0.25*
NP		0.39**	0.39**	0.40**	0.40**		-1.11**	-1.11**	-1.10**	-1.10**
		0.11	*0.11*	*0.11*	*0.11*		*0.24*	*0.24*	*0.24*	*0.24*
NUP		-0.02	-0.02	-0.02	-0.02		0.44*	0.44*	0.44*	0.44*
		0.01	*0.01*	*0.01*	*0.01*		*0.21*	*0.21*	*0.21*	*0.21*
Age[a]			0.00		0.00			0.00		0.00
			0.01		*0.01*			*0.01*		*0.01*
Male			0.08		0.07			-0.03		-0.05
			0.23		*0.26*			*0.17*		*0.20*
Edu.[a]			-0.03		-0.01			-0.02		-0.02
			0.05		*0.07*			*0.05*		*0.07*
Pos. Af[a]			0.02		0.03			0.01		0.01
			0.03		*0.03*			*0.02*		*0.03*
Neg. Af.[a]			0.00		-0.03			0.04		0.04
			0.08		*0.10*			*0.06*		*0.08*

Table A-20 Continued

	ENVY					DISGUST				
	1	2	3	4	5	1	2	3	4	5
Symbolic Racism[a]				0.61	0.50				0.68	0.41
				0.58	*0.70*				*0.38*	*0.56*
Contact[a]				0.00	0.00				-0.01	-0.01
				0.01	*0.01*				*0.01*	*0.01*
Stereot.[a]				0.00	-0.02				0.01	0.00
				0.02	*0.03*				*0.02*	*0.03*
Random Intercept Variance	0.16	0.18	0.20	0.19	0.21	0.07	0.12	0.13	0.11	0.13
Residual variance	0.71	0.71	0.71	0.70	0.70	0.86	0.86	0.86	0.80	0.80
Total Variance	1.26	1.15	1.16	1.15	1.18	1.74	1.39	1.40	1.33	1.35
rho	0.13	0.15	0.17	0.17	0.18	0.04	0.09	0.09	0.08	0.10

Note 1: ** $p < 0.01$, * $p < 0.05$.

Note 2: Standard errors are in *italics* below the coefficients.

Note 3: BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant.

Note 4: [a] Centered.

Note 5: Sample sizes: Model 1-3=30; Model 4-5= 29.

Table A-21 Reaction time mixed-effects regression results: anger and fear

	ANGRY					FEAR				
	1	2	3	4	5	1	2	3	4	5
BM		-0.38**	-0.38**	-0.38**	-0.38**		-0.31**	-0.31**	-0.31**	-0.31**
		0.05	*0.05*	*0.05*	*0.05*		*0.04*	*0.04*	*0.04*	*0.04*
WM		-0.38**	-0.38**	-0.38**	-0.38**		-0.31**	-0.31**	-0.31**	-0.31**
		0.05	*0.05*	*0.05*	*0.05*		*0.04*	*0.04*	*0.04*	*0.04*
WL		0.01	0.01	0	0		-0.02	-0.02	-0.01	-0.01
		0.05	*0.05*	*0.05*	*0.05*		*0.04*	*0.04*	*0.04*	*0.04*
WM		-0.35**	-0.35**	-0.35**	-0.35**		-0.26**	-0.26**	-0.26**	-0.26**
		0.05	*0.05*	*0.05*	*0.05*		*0.04*	*0.04*	*0.04*	*0.04*
WH		-0.32**	-0.32**	-0.33**	-0.33**		-0.28**	-0.28**	-0.28**	-0.28**
		0.05	*0.05*	*0.05*	*0.05*		*0.04*	*0.04*	*0.04*	*0.04*
NP		-0.41**	-0.41**	-0.41**	-0.41**		-0.33**	-0.33**	-0.32**	-0.32**
		0.05	*0.05*	*0.05*	*0.05*		*0.04*	*0.04*	*0.04*	*0.04*
NUP		-0.03	-0.03	-0.03	-0.03		0.05	0.05	0.06	0.06
		0.05	*0.05*	*0.05*	*0.05*		*0.04*	*0.04*	*0.04*	*0.04*
Age[a]			0.01		0.01			0.01		0.01*
			0		*0.01*			*0*		*0.01*
Male			-0.18		-0.16			-0.2		-0.17
			0.11		*0.12*			*0.1*		*0.11*
Edu.[a]			0.01		0.02			0.01		0.02
			0.03		*0.03*			*0.03*		*0.03*
Pos. Af[a]			0.02		0.01			0.02		0.01
			0.01		*0.01*			*0.01*		*0.01*
Neg. Af.[a]			-0.03		-0.01			-0.02		0
			0.04		*0.04*			*0.04*		*0.04*
Symbolic				0.07	0.01				0.12	0.03
Racism[a]				*0.35*	*0.35*				*0.34*	*0.33*
Contact[a]				-0.01	-0.01				0	-0.01
				0.01	*0*				*0*	*0*

Table A-21 Continued

	ANGRY					FEAR				
	1	2	3	4	5	1	2	3	4	5
Stereot.[a]				0.03	0.01				0.02	0.01
				0.01	*0.02*				*0.01*	*0.02*
Random Intercept Variance	0.12	0.12	0.086	0.11	0.089	0.1	0.11	0.072	0.11	0.079
Residual variance	0.29	0.29	0.29	0.29	0.29	0.28	0.28	0.28	0.28	0.28
Total Variance	0.46	0.43	0.39	0.42	0.4	0.42	0.4	0.36	0.4	0.38
rho	0.25	0.28	0.22	0.27	0.22	0.24	0.26	0.2	0.26	0.21

Note 1: ** $p < 0.01$, * $p < 0.05$.

Note 2: Standard errors are in *italics* below the coefficients.

Note 3: BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant.

Note 4: [a] Centered.

Note 5: Sample sizes: Model 1-3=30; Model 4-5= 29.

Table A-22 Reaction time mixed-effects regression results: anger and happiness

	SADNESS					**HAPPINESS**				
	1	2	3	4	5	1	2	3	4	5
BM		-0.38**	-0.38**	-0.38**	-0.38**		0.05	0.05	0.06	0.06
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
WM		-0.35**	-0.35**	-0.35**	-0.35**		0.11*	0.11*	0.11*	0.11*
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
WL		-0.03	-0.03	-0.02	-0.02		0.01	0.01	0.01	0.01
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
WM		-0.35**	-0.35**	-0.36**	-0.36**		0.14**	0.14**	0.15**	0.15**
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
WH		-0.31**	-0.31**	-0.31**	-0.31**		0.11*	0.11*	0.12*	0.12*
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
NP		-0.38**	-0.38**	-0.38**	-0.38**		0.11*	0.11*	0.12*	0.12*
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
NUP		-0.09	-0.09	-0.09	-0.09		0.01	0.01	0.02	0.02
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
Age[a]			0.01*		0.01*			0.01**		0.01**
			0		*0*			*0*		*0*
Male			-0.19*		-0.17			-0.20*		-0.20*
			0.1		*0.11*			*0.09*		*0.1*
Edu.[a]			0.01		0.02			0.03		0.02
			0.02		*0.03*			*0.02*		*0.03*
Pos. Af[a]			0.02		0.01			0.01		0.01
			0.01		*0.01*			*0.01*		*0.01*
Neg. Af.[a]			-0.02		0			-0.02		-0.01
			0.03		*0.04*			*0.03*		*0.04*
Symbolic				-0.02	-0.05				-0.17	-0.2
Racism[a]				*0.33*	*0.31*				*0.35*	*0.29*
Contact[a]				0	-0.01				0	0
				0	*0*				*0.01*	*0*

Table A-22 Continued

	SADNESS					**HAPPINESS**				
	1	2	3	4	5	1	2	3	4	5
Stereot.[a]				0.02	0.01				0.01	0
				0.01	*0.01*				*0.01*	*0.01*
Random Intercept Variance	0.093	0.097	0.063	0.098	0.069	0.11	0.11	0.057	0.11	0.063
Residual variance	0.27	0.27	0.27	0.28	0.28	0.32	0.32	0.32	0.32	0.32
Total Variance	0.42	0.39	0.36	0.4	0.37	0.46	0.46	0.4	0.45	0.41
rho	0.22	0.25	0.17	0.25	0.19	0.24	0.24	0.14	0.24	0.15

Note 1: ** $p < 0.01$, * $p < 0.05$.

Note 2: Standard errors are in *italics* below the coefficients.

Note 3: BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant.

Note 4: [a] Centered.

Note 5: Sample sizes: Model 1-3=30; Model 4-5= 29.

Table A-23 Reaction time mixed-effects regression results: pity and pride

	PITY					**PRIDE**				
	1	2	3	4	5	1	2	3	4	5
BM		-0.38**	-0.38**	-0.38**	-0.38**		0.15**	0.15**	0.15**	0.15**
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
WM		-0.38**	-0.38**	-0.39**	-0.39**		0.12*	0.12*	0.13*	0.13*
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
WL		-0.02	-0.02	-0.02	-0.02		-0.01	-0.01	-0.01	-0.01
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
WM		-0.34**	-0.34**	-0.33**	-0.33**		0.21**	0.21**	0.21**	0.21**
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
WH		-0.30**	-0.30**	-0.31**	-0.31**		0.08	0.08	0.09	0.09
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
NP		-0.39**	-0.39**	-0.39**	-0.39**		0.07	0.07	0.07	0.07
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
NUP		-0.20**	-0.20**	-0.21**	-0.21**		-0.03	-0.03	-0.03	-0.03
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
Age[a]			0.01		0.01*			0.01*		0.01*
			0		*0*			*0*		*0.01*
Male			-0.18		-0.15			-0.19		-0.16
			0.1		*0.11*			*0.12*		*0.12*
Edu.[a]			0.01		0.01			-0.01		0
			0.03		*0.03*			*0.03*		*0.03*
Pos. Af[a]			0.02		0.01			0.02		0.01
			0.01		*0.01*			*0.01*		*0.02*
Neg. Af.[a]			-0.02		0			-0.06		-0.04
			0.04		*0.04*			*0.04*		*0.04*
Symbolic				-0.03	-0.11				0.23	0.24
Racism[a]				*0.32*	*0.32*				*0.39*	*0.35*
Contact[a]				0	-0.01				0	-0.01
				0	*0*				*0.01*	*0*

Table A-23 Continued

	PITY					**PRIDE**				
	1	2	3	4	5	1	2	3	4	5
Stereot.[a]				0.02	0.01				0.03	0.02
				0.01	*0.02*				*0.02*	*0.02*
Random Intercept Variance	0.096	0.099	0.071	0.095	0.075	0.14	0.14	0.087	0.14	0.092
Residual variance	0.27	0.27	0.27	0.27	0.27	0.31	0.31	0.31	0.31	0.31
Total Variance	0.41	0.39	0.36	0.39	0.37	0.49	0.48	0.43	0.48	0.43
rho	0.23	0.26	0.2	0.25	0.2	0.29	0.3	0.2	0.29	0.21

Note 1: ** $p < 0.01$, * $p < 0.05$.

Note 2: Standard errors are in *italics* below the coefficients.

Note 3: BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant.

Note 4: [a] Centered.

Note 5: Sample sizes: Model 1-3=30; Model 4-5= 29.

Table A-24 Reaction time mixed-effects regression results: envy and disgust

	ENVY					**DISGUST**				
	1	2	3	4	5	1	2	3	4	5
BM		0.12*	0.12*	0.12*	0.12*		-0.41**	-0.41**	-0.41**	-0.41**
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
WM		0.09	0.09	0.09	0.09		-0.37**	-0.37**	-0.38**	-0.38**
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
WL		-0.03	-0.03	-0.03	-0.03		-0.05	-0.05	-0.06	-0.06
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
WM		0.18**	0.18**	0.18**	0.18**		-0.37**	-0.37**	-0.37**	-0.37**
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
WH		0.09	0.09	0.08	0.08		-0.34**	-0.34**	-0.35**	-0.35**
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
NP		0.05	0.05	0.05	0.05		-0.39**	-0.39**	-0.39**	-0.39**
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
NUP		-0.05	-0.05	-0.05	-0.05		-0.11*	-0.11*	-0.11*	-0.11*
		0.05	*0.05*	*0.05*	*0.05*		*0.05*	*0.05*	*0.05*	*0.05*
Age[a]			0.01		0.01			0.01		0.01
			0		*0.01*			*0*		*0.01*
Male			-0.19		-0.17			-0.21		-0.19
			0.11		*0.12*			*0.11*		*0.12*
Edu.[a]			0		0.01			0.01		0.02
			0.03		*0.03*			*0.03*		*0.03*
Pos. Af[a]			0.02		0.02			0.02		0.01
			0.01		*0.02*			*0.01*		*0.02*
Neg. Af.[a]			-0.05		-0.04			-0.02		-0.01
			0.04		*0.04*			*0.04*		*0.04*
Symbolic				0.11	0.1				0.1	0.03
Racism[a]				*0.37*	*0.36*				*0.35*	*0.35*
Contact[a]				0	-0.01				-0.01	-0.01
				0.01	*0*				*0.01*	*0*

Table A-24 Continued

	ENVY					**DISGUST**				
	1	2	3	4	5	1	2	3	4	5
Stereot.[a]				0.02	0				0.02	0.01
				0.02	*0.02*				*0.01*	*0.02*
Random Intercept Variance	0.12	0.12	0.085	0.12	0.094	0.11	0.11	0.084	0.11	0.091
Residual variance	0.29	0.29	0.29	0.29	0.29	0.28	0.28	0.28	0.29	0.29
Total Variance	0.44	0.44	0.4	0.44	0.41	0.44	0.42	0.39	0.42	0.4
rho	0.28	0.28	0.21	0.28	0.23	0.25	0.27	0.22	0.27	0.23

Note 1: ** $p < 0.01$, * $p < 0.05$.

Note 2: Standard errors are in *italics* below the coefficients.

Note 3: BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant.

Note 4: [a] Centered.

Note 5: Sample sizes: Model 1-3=30; Model 4-5= 29.

Table A-25 Residual diagnostics for lesion analysis

	Occasions		Condition nested in subject		Subjects	
	Level1		Level2		Level3	
	Skewness	Kurtosis	Skewness	Kurtosis	Skewness	Kurtosis
ANGRY	1.8	14.2	1.8	10.4	1.4	4.8
HAPPY	-.3	5.6	-.0	2.9	.3	2.2
SAD	.5	10.2	.5	7.4	.7	4.2
ENVY	.7	9.4	.3	4.8	1.5	4.3
FEAR	.3	13.1	.5	7.9	1.8	7.2
PITY	.5	11.1	.5	7.1	.7	3.5
PRIDE	.4	6.7	.09	2.8	.8	2.1
DISGUST	1.2	9.2	1.6	9.6	1.2	3.9

Note: Previous literature suggest that kurtosis values greater than seven and skewness values greater than two produce inaccurate standard errors and t-statistics (Curran, West, & Finch 1996, Chou and Bentler 1995 recommend concern if skewness > 2 and kurtosis > 7).

Table A-26 Reduced model mixed-effects regression results

	Angry	Sad	Happy	Fear	Envy	Pride	Disgust	Pity
VMPFC	0.09	-0.01	0.00	-0.03	0.09	0.05	0.06	0.07
	0.16	*0.16*	*0.32*	*0.12*	*0.34*	*0.33*	*0.16*	*0.20*
AMY	0.08	-0.07	0.70	0.13	0.00	0.89	0.03	0.06
	0.29	*0.28*	*0.39*	*0.29*	*0.36*	*0.55*	*0.25*	*0.26*
INS	0.15	0.07	0.10	0.10	0.20	0.35	0.13	0.06
	0.21	*0.14*	*0.27*	*0.19*	*0.28*	*0.36*	*0.20*	*0.16*
Centered age	0.00	-0.01	0.00	-0.01	-0.01	-0.01	0.00	0.00
	0.01	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*
Male	0.13	0.02	0.33	0.01	0.49*	0.48	0.20	0.02
	0.12	*0.11*	*0.25*	*0.12*	*0.25*	*0.28*	*0.14*	*0.12*
Centered education	-0.04	-0.04	-0.03	-0.03	-0.05	-0.07	-0.05	-0.03
	0.03	*0.03*	*0.06*	*0.02*	*0.06*	*0.06*	*0.03*	*0.03*
sd(Subject)	0.27	0.00	0.30	0.15	0.55	0.63	0.24	0.00
	0.70	*0.00*	*1.87*	*1.23*	*0.11*	*0.09*	*1.17*	*0.00*
sd(Condition)	0.59	1.09	1.40	0.84	0.61	0.86	0.78	1.07
	0.08	*0.06*	*0.06*	*0.06*	*0.11*	*0.11*	*0.09*	*0.07*
sd(Residual)	0.71	0.80	1.03	0.69	0.81	0.96	0.86	0.76
	0.05	*0.04*	*0.04*	*0.04*	*0.08*	*0.08*	*0.04*	*0.05*
chi2(2)	3349.91	6293.83	6479.49	5507.65	3863.94	4540.95	3618.76	6618.44

Note: ** $p < 0.01$, * $p < 0.05$. Bootstrapped standard errors are reported. Standard deviations in *italics* below the coefficients.

Table A-27 Main effects and combined interaction effects from the full model mixed-effects regression

	df	chi2	P>chi2		df	chi2	P>chi2
Angry:				**Envy:**			
Condition	7	46.22	0	Condition	7	13.39	0.06
Lesion	3	0.81	0.85	Lesion	3	0.57	0.90
Condition X Lesion	19	391.39	0	Condition X Lesion	20	356.69	0
Happy:				**Pity:**			
Condition	7	648.02	0	Condition	7	237.99	0
Lesion	3	3.19	0.36	Lesion	3	0.3	0.96
Condition X Lesion	19	402.45	0	Condition X Lesion	19	1514.22	0
Sad:				**Pride:**			
Condition	7	220.93	0	Condition	7	88.91	0
Lesion	3	0.37	0.95	Lesion	3	3.35	0.34
Condition X Lesion	19	232.43	0	Condition X Lesion	19	11450.52	0
Fear:				**Disgust:**			
Condition	7	225.52	0	Condition	7	93.75	0
Lesion	3	0.61	0.89	Lesion	3	0.48	0.92
Condition X Lesion	19	282.97	0	Condition X Lesion	19	2031.08	0

Table A-28 Full model mixed-effects regression results for lesion analysis

	Angry	Disgust	Envy	Fear	Happy	Pity	Pride	Sad
BM	-0.66**	-0.84**	0.51**	-0.24**	2.80**	-2.12**	1.22**	-2.22**
	0.17	*0.22*	*0.18*	*0.09*	*0.21*	*0.23*	*0.26*	*0.21*
BU	-0.65**	-0.81**	0.60**	-0.22*	1.64**	-2.09**	0.74**	-2.19**
	0.17	*0.22*	*0.19*	*0.09*	*0.19*	*0.23*	*0.21*	*0.21*
WL	0.05	0.14*	0.00	0.01	-0.04	0.21*	-0.02	0.24**
	0.03	*0.05*	*0.01*	*0.03*	*0.03*	*0.09*	*0.02*	*0.09*
WM	-0.65**	-0.83**	0.73**	-0.24*	2.66**	-2.12**	1.16**	-2.22**
	0.17	*0.22*	*0.22*	*0.09*	*0.19*	*0.23*	*0.26*	*0.21*
WU	-0.63**	-0.78**	0.80**	-0.24*	1.37**	-2.08**	0.67**	-2.16**
	0.17	*0.22*	*0.24*	*0.09*	*0.20*	*0.23*	*0.21*	*0.21*
NP	-0.66**	-0.82**	0.41**	-0.23*	2.49**	-2.09**	0.42**	-2.18**
	0.17	*0.22*	*0.13*	*0.09*	*0.20*	*0.23*	*0.15*	*0.21*
NUP	-0.14	0.52**	0.00	1.84**	0.02	-1.96**	0.02	-1.80**
	0.13	*0.17*	*0.01*	*0.21*	*0.04*	*0.21*	*0.02*	*0.19*
VMPFC	-0.06	0.03	-0.01	-0.13	0.06	-0.06	0.11	-0.26
	0.35	*0.44*	*0.18*	*0.17*	*0.15*	*0.47*	*0.19*	*0.33*
AMY	-0.26	0.04	0.19	0.17	0.21	-0.29	0.25	-0.34
	0.39	*0.40*	*0.33*	*0.39*	*0.28*	*0.48*	*0.44*	*0.62*
INS	0.37	0.42	0.06	0.37	-0.02	0.06	0.07	0.40
	0.56	*0.60*	*0.13*	*0.56*	*0.13*	*0.45*	*0.18*	*0.37*
VMPFCxBM	0.03	-0.06	0.21	0.11	-0.40	0.10	-0.53	0.24
	0.33	*0.42*	*0.61*	*0.15*	*0.61*	*0.45*	*0.55*	*0.32*
AMYxBM	0.21	-0.10	-0.04	-0.17	0.93**	0.23	1.41**	0.25
	0.33	*0.38*	*0.30*	*0.31*	*0.30*	*0.47*	*0.54*	*0.61*

Table A-28 Continued

	Angry	Disgust	Envy	Fear	Happy	Pity	Pride	Sad
INSxBM	-0.38	-0.42	0.44	-0.33	0.01	-0.06	0.34	-0.40
	0.56	*0.63*	*0.56*	*0.56*	*0.43*	*0.45*	*0.66*	*0.38*
VMPFCxBU	0.05	-0.03	0.03	0.09	-0.22	0.10	-0.21	0.24
	0.32	*0.41*	*0.59*	*0.15*	*0.52*	*0.43*	*0.39*	*0.31*
AMYxBU	0.37	0.12	-0.28	0.07	0.92*	0.49	1.39*	0.43
	0.22	*0.31*	*0.27*	*0.10*	*0.43*	*0.44*	*0.61*	*0.56*
INSxBU	-0.32	-0.46	0.22	-0.37	-0.06	-0.07	0.32	-0.39
	0.51	*0.62*	*0.57*	*0.54*	*0.69*	*0.44*	*0.62*	*0.36*
VMPFCxWL	-0.04	-0.10	0.00	-0.09	0.03	0.09	-0.02	-0.11
	0.13	*0.12*	*0.01*	*0.10*	*0.04*	*0.20*	*0.04*	*0.16*
AMYxWL	0.11	-0.37**	0.09	-0.06	-0.01	-0.08	-0.05	-0.31
	0.17	*0.08*	*0.12*	*0.05*	*0.09*	*0.23*	*0.07*	*0.18*
INSxWL	-0.09	0.01	0.01	0.01	0.07	-0.06	-0.02	-0.48*
	0.20	*0.08*	*0.05*	*0.05*	*0.06*	*0.18*	*0.04*	*0.25*
VMPFCxWM	0.03	-0.05	0.18	0.14	-0.08	0.08	-0.19	0.24
	0.33	*0.42*	*0.72*	*0.12*	*0.35*	*0.46*	*0.57*	*0.32*
AMYxWM	0.22	-0.03	-0.29	-0.15	0.86*	0.26	1.20	0.24
	0.31	*0.35*	*0.28*	*0.28*	*0.38*	*0.46*	*0.65*	*0.61*
INSxWM	-0.35	-0.41	0.15	-0.35	0.11	0.00	0.34	-0.40
	0.56	*0.62*	*0.56*	*0.54*	*0.41*	*0.42*	*0.75*	*0.38*
VMPFCxWU	0.04	-0.02	0.03	0.10	0.15	0.05	0.04	0.19
	0.30	*0.40*	*0.71*	*0.15*	*0.53*	*0.47*	*0.56*	*0.32*
AMYxWU	0.37	0.09	-0.43	-0.01	1.05**	0.57	0.94	0.36
	0.21	*0.31*	*0.32*	*0.19*	*0.36*	*0.46*	*0.61*	*0.56*

Table A-28 Continued

	Angry	Disgust	Envy	Fear	Happy	Pity	Pride	Sad
INSxWU	-0.41	-0.43	-0.15	-0.37	0.27	-0.04	0.26	-0.44
	0.57	*0.60*	*0.52*	*0.56*	*0.67*	*0.48*	*0.56*	*0.39*
VMPFCxNP	0.08	-0.06	0.35	0.12	0.13	0.39	0.58	0.33
	0.28	*0.43*	*0.59*	*0.16*	*0.27*	*0.31*	*0.39*	*0.28*
AMYxNP	0.36	0.04	-0.33	-0.10	0.28	0.38	0.63	0.36
	0.23	*0.33*	*0.22*	*0.25*	*0.64*	*0.43*	*0.56*	*0.56*
INSxNP	-0.36	-0.45	0.35	-0.34	0.40	-0.08	0.95*	-0.44
	0.56	*0.62*	*0.34*	*0.56*	*0.30*	*0.46*	*0.48*	*0.38*
VMPFCxNUP	1.00	0.59	0.00	0.28	-0.08	0.24	-0.10	0.85**
	0.65	*0.76*	*0.01*	*0.44*	*0.13*	*0.33*	*0.15*	*0.31*
AMYxNUP	1.09*	0.22	-0.18	0.09	-0.15	0.96	-0.38	0.80
	0.46	*0.40*	*0.14*	*0.54*	*0.12*	*0.56*	*0.30*	*0.47*
INSxNUP	0.17	-0.16	0.10	-0.45	0.12	0.36	0.08	-0.03
	0.30	*0.30*	*0.14*	*0.45*	*0.14*	*0.44*	*0.12*	*0.47*
Centered age	0.00	0.00	-0.01	-0.01	0.00	0.00	-0.01	-0.01
	0.01	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*	*0.01*
Male	0.13	0.20	0.49*	0.01	0.33	0.02	0.48	0.02
	0.12	*0.14*	*0.25*	*0.12*	*0.25*	*0.12*	*0.28*	*0.11*
Centered education	-0.04	-0.05	-0.05	-0.03	-0.03	-0.03	-0.07	-0.04
	0.03	*0.03*	*0.06*	*0.02*	*0.06*	*0.03*	*0.06*	*0.03*
sd(subject)	0.30	0.32	0.56	0.29	0.54	0.32	0.67	0.30
	0.15	*0.07*	*0.10*	*0.18*	*0.07*	*0.07*	*0.09*	*0.12*
sd(condition)	0.45	0.52	0.53	0.43	0.54	0.48	0.59	0.45
	0.07	*0.09*	*0.09*	*0.04*	*0.04*	*0.06*	*0.07*	*0.06*

Table A-28 Continued

	Angry	Disgust	Envy	Fear	Happy	Pity	Pride	Sad
sd(Residual)	0.71	0.86	0.81	0.69	1.03	0.76	0.96	0.80
	0.05	*0.04*	*0.08*	*0.04*	*0.04*	*0.05*	*0.07*	*0.04*
chi2(2)	2264.11	1953.85	3375.71	2211.36	2175.34	2188.19	3234.05	1728.08

Note 1: ** $p < 0.01$, * $p < 0.05$. Bootstrapped standard errors are reported. Standard deviation in *italics* below the coefficients.

Note 2: Black lower class, normal/BDC sample group and female are the omitted categories. BM=Black Middle, BU=Black Upper, WL=White Lower, WM=White Middle, WU=White Upper, NP=Non-human Pleasant, NUP=Non-human Unpleasant. VMPFC=Ventromedial Prefrontal Cortex, AMY= Amygdala, INS=Insula.

Table A-29 The proportions of reporting ‘yes’ for each emotion, lesion analysis

	Normal/BDC	VMPFC	AMY	INS	Condition	Normal/BDC	VMPFC	AMY	INS
	ANGRY					**PITY**			
BL	0.29	0.34	0.2	0.31	BL	0.74	0.83	0.63	0.7
s.d.	*0.5*	*0.5*	*0.4*	*0.5*	*s.d.*	*0.4*	*0.4*	*0.5*	*0.5*
BM	0	0	0.02	0	BM	0	0.02	0.02	0.01
s.d.	*0*	*0*	*0.2*	*0*	*s.d.*	*0*	*0.2*	*0.2*	*0.1*
BU	0.01	0.02	0.08	0.02	BU	0.02	0.04	0.11	0.01
s.d.	*0.1*	*0.1*	*0.3*	*0.1*	*s.d.*	*0.1*	*0.2*	*0.3*	*0.1*
WL	0.33	0.38	0.26	0.3	WL	0.81	0.92	0.65	0.72
s.d.	*0.5*	*0.5*	*0.4*	*0.5*	*s.d.*	*0.4*	*0.3*	*0.5*	*0.5*
WM	0.01	0.01	0.06	0.02	WM	0	0.02	0.05	0.02
s.d.	*0.1*	*0.1*	*0.2*	*0.1*	*s.d.*	*0*	*0.1*	*0.2*	*0.1*
WU	0.02	0.03	0.1	0.01	WU	0.02	0.02	0.16	0.02
s.d.	*0.2*	*0.2*	*0.3*	*0.1*	*s.d.*	*0.1*	*0.2*	*0.4*	*0.1*
NP	0	0.02	0.07	0.01	NP	0.01	0.11	0.08	0.01
s.d.	*0.1*	*0.2*	*0.3*	*0.1*	*s.d.*	*0.1*	*0.3*	*0.3*	*0.1*
NUP	0.16	0.46	0.36	0.29	NUP	0.06	0.15	0.25	0.17
s.d.	*0.4*	*0.5*	*0.5*	*0.5*	*s.d.*	*0.2*	*0.4*	*0.4*	*0.4*
	HAPPY					**PRIDE**			
BL	0.03	0.03	0.13	0.01	BL	0.02	0.04	0.18	0.02
s.d.	*0.2*	*0.2*	*0.3*	*0.1*	*s.d.*	*0.1*	*0.2*	*0.4*	*0.2*
BM	0.88	0.82	0.98	0.9	BM	0.43	0.25	0.79	0.49
s.d.	*0.3*	*0.4*	*0.2*	*0.3*	*s.d.*	*0.5*	*0.4*	*0.4*	*0.5*
BU	0.59	0.5	0.75	0.54	BU	0.26	0.21	0.7	0.38
s.d.	*0.5*	*0.5*	*0.4*	*0.5*	*s.d.*	*0.4*	*0.4*	*0.5*	*0.5*

Table A-29 Continued

	Normal/BDC	VMPFC	AMY	INS	Condition	Normal/BDC	VMPFC	AMY	INS
WL	0.01	0.04	0.15	0.02	WL	0.01	0.03	0.14	0.01
s.d.	*0.1*	*0.2*	*0.4*	*0.1*	*s.d.*	*0.1*	*0.2*	*0.4*	*0.1*
WM	0.86	0.9	0.94	0.89	WM	0.4	0.37	0.72	0.49
s.d.	*0.4*	*0.3*	*0.2*	*0.3*	*s.d.*	*0.5*	*0.5*	*0.5*	*0.5*
WU	0.52	0.54	0.73	0.56	WU	0.23	0.23	0.61	0.31
s.d.	*0.5*	*0.5*	*0.4*	*0.5*	*s.d.*	*0.4*	*0.4*	*0.5*	*0.5*
NP	0.82	0.88	0.81	0.89	NP	0.15	0.42	0.46	0.45
s.d.	*0.4*	*0.3*	*0.4*	*0.3*	*s.d.*	*0.4*	*0.5*	*0.5*	*0.5*
NUP	0.04	0.02	0.06	0.06	NUP	0.02	0.04	0.05	0.06
s.d.	*0.2*	*0.2*	*0.2*	*0.2*	*s.d.*	*0.1*	*0.2*	*0.2*	*0.2*
	SAD					**ENVY**			
BL	0.78	0.84	0.63	0.83	BL	0	0	0.11	0.02
s.d.	*0.4*	*0.4*	*0.5*	*0.4*	*s.d.*	*0*	*0*	*0.3*	*0.1*
BM	0	0.01	0.06	0	BM	0.21	0.18	0.23	0.31
s.d.	*0*	*0.1*	*0.2*	*0*	*s.d.*	*0.4*	*0.4*	*0.4*	*0.5*
BU	0.02	0.02	0.1	0.02	BU	0.25	0.18	0.21	0.27
s.d.	*0.1*	*0.2*	*0.3*	*0.1*	*s.d.*	*0.4*	*0.4*	*0.4*	*0.4*
WL	0.83	0.9	0.63	0.78	WL	0	0.01	0.14	0.02
s.d.	*0.4*	*0.3*	*0.5*	*0.4*	*s.d.*	*0.1*	*0.1*	*0.4*	*0.1*
WM	0	0.01	0.06	0	WM	0.27	0.3	0.24	0.28
s.d.	*0.1*	*0.1*	*0.2*	*0*	*s.d.*	*0.4*	*0.5*	*0.4*	*0.5*
WU	0.03	0.02	0.1	0.01	WU	0.32	0.24	0.23	0.22
s.d.	*0.2*	*0.1*	*0.3*	*0.1*	*s.d.*	*0.5*	*0.4*	*0.4*	*0.4*
NP	0.02	0.06	0.09	0	NP	0.15	0.22	0.13	0.22
s.d.	*0.1*	*0.2*	*0.3*	*0*	*s.d.*	*0.4*	*0.4*	*0.3*	*0.4*

Table A-29 Continued

	Normal/BDC	VMPFC	AMY	INS	Condition	Normal/BDC	VMPFC	AMY	INS
NUP	0.13	0.38	0.3	0.24	NUP	0.01	0	0.05	0.04
s.d.	*0.3*	*0.5*	*0.5*	*0.4*	*s.d.*	*0.1*	*0*	*0.2*	*0.2*
	FEAR					**DISGUST**			
BL	0.14	0.04	0.22	0.18	BL	0.34	0.43	0.34	0.38
s.d.	*0.3*	*0.2*	*0.4*	*0.4*	*s.d.*	*0.5*	*0.5*	*0.5*	*0.5*
BM	0	0	0.09	0.01	BM	0	0	0.04	0.01
s.d.	*0*	*0*	*0.3*	*0.1*	*s.d.*	*0*	*0*	*0.2*	*0.1*
BU	0.01	0	0.15	0.01	BU	0.02	0.03	0.09	0
s.d.	*0.1*	*0*	*0.4*	*0.1*	*s.d.*	*0.1*	*0.2*	*0.3*	*0*
WL	0.14	0.02	0.22	0.18	WL	0.38	0.45	0.27	0.43
s.d.	*0.3*	*0.1*	*0.4*	*0.4*	*s.d.*	*0.5*	*0.5*	*0.4*	*0.5*
WM	0	0.01	0.11	0.02	WM	0	0.01	0.06	0.01
s.d.	*0*	*0.1*	*0.3*	*0.1*	*s.d.*	*0*	*0.1*	*0.2*	*0.1*
WU	0	0	0.15	0	WU	0.02	0.05	0.14	0.02
s.d.	*0.1*	*0*	*0.4*	*0*	*s.d.*	*0.2*	*0.2*	*0.3*	*0.2*
NP	0.01	0.02	0.09	0.01	NP	0.01	0.01	0.08	0
s.d.	*0.1*	*0.1*	*0.3*	*0.1*	*s.d.*	*0.1*	*0.1*	*0.3*	*0*
NUP	0.66	0.7	0.62	0.58	NUP	0.39	0.59	0.42	0.47
s.d.	*0.5*	*0.5*	*0.5*	*0.5*	*s.d.*	*0.5*	*0.5*	*0.5*	*0.5*

Note: s.d.=standard deviation (in *italics*)

Table A-30 Regions of activation elicited by the conditions (vs. the fixation cross) in a whole-brain analysis

	mm^3	x	y	z	t-score		mm^3	x	y	z	t-score
Black Upper						***White Upper***					
R. Lingual Gyrus	134730	-5	83	-13	12.701	R. Lingual Gyrus	127548	-5	83	-13	14.812
R. Mid Orbital Gyrus	9207	-5	-35	-1	-8.861	R. Anterior Cingulate Cortex	7992	-5	-38	6	-9.674
R. Angular Gyrus	6291	-44	62	42	-7.375	R. Inferior Parietal Lobule	5859	-44	56	45	-6.717
R. Middle Cingulate Cortex	3537	-2	41	36	-5.763	R. Cuneus	4752	-8	71	21	-6.988
R. Precentral Gyrus	2403	-50	-2	42	7.209	L. Angular Gyrus	2727	50	62	30	-5.886
R. Inferior Frontal Gyrus	2133	-53	-14	24	5.232	R. Precentral Gyrus	2214	-50	-2	39	7.496
L. Supra Marginal Gyrus	1971	59	38	33	-4.709	R. Middle Frontal Gyrus	2160	-29	-32	39	-10.537
R. Rectal Gyrus	1431	-2	-44	-10	6.625	L. Middle Frontal Gyrus	1458	29	-23	42	-8.389
L. Middle Frontal Gyrus	1377	26	-23	36	-6.18	L. Precuneus	1431	11	56	21	-6.533
R. Pallidum	1350	-8	2	3	5.373	R. Inferior Frontal Gyrus	1350	-38	-44	3	-16.493
R. Superior Occipital Gyrus	1215	-26	71	42	5.373	L. Precuneus	1269	17	41	6	-7.407
L. Superior Temporal Gyrus	999	62	32	18	-4.608	R. Inferior Frontal Gyrus	1215	-53	-14	24	5.971
R. Middle Frontal Gyrus	999	-26	-44	33	-5.824	R. Mid Orbital Gyrus	1107	-2	-53	-4	5.549
L. Pallidum	972	8	2	6	6.031	L. Inferior Frontal Gyrus	1107	38	-20	-7	5.179
R. Fusiform Gyrus	918	-35	5	-34	4.947	L. SMA	1080	2	-2	48	5.385
L. Calcarine Gyrus	918	11	65	15	-6.41	L. Inferior Frontal Gyrus	1026	41	2	27	5.566
R. Precuneus	648	-8	71	30	-6.056	R. Fusiform Gyrus	783	-35	8	-34	5.713
						L. Fusiform Gyrus	702	26	-5	-37	5.344
						R. Precuneus	648	-2	68	48	5.542
Black Lower						***White Lower***					
R. Lingual Gyrus	122769	-5	80	-13	13.436	R. Lingual Gyrus	133326	-5	83	-13	12.493
R. Middle Frontal Gyrus	22788	-29	-41	33	-11.988	L. Inferior Frontal Gyrus	28323	32	-47	-10	-8.863
L. SupraMarginal Gyrus	4698	59	41	30	-5.725	L. Inferior Parietal Lobule	5940	50	53	36	-5.567
R. Precentral Gyrus	4536	-44	5	30	7.713	R. Inferior Parietal Lobule	4347	-44	56	45	-6.022

Table A-30 Continued

	mm^3	x	y	z	t-score		mm^3	x	y	z	t-score
Black Lower						***White Lower***					
R. Inferior Parietal Lobule	3699	-47	53	45	-7.015	R. Precentral Gyrus	2322	-44	5	30	7.802
L. Cuneus	2403	-2	71	30	-7.97	R. Precuneus	1971	-20	41	6	-7.148
R. Middle Cingulate Cortex	1161	-2	29	21	-5.333	R. Inferior Frontal Gyrus	1782	-56	-14	21	5.797
R. Superior Parietal Lobule	1107	-17	74	48	4.989	R. Superior Parietal Lobule	1647	-17	74	48	5.305
R. Medial Temporal Pole	1053	-29	-17	-25	6.904	R. Rectal Gyrus	1566	-2	-44	-16	8.229
R. Inferior Temporal Gyrus	810	-41	11	-31	5.787	L. Thalamus	1566	2	29	21	-6.506
R. Pallidum	810	-14	-2	6	5.853	L. Inferior Frontal Gyrus	1404	44	2	27	4.77
L. Insula Lobe	756	35	2	9	-5.202	L. Inferior Frontal Gyrus	1215	53	-17	24	6.328
R. Fusiform Gyrus	648	-32	5	-37	5.633	R. Insula Lobe	1107	-41	-11	-4	-6.055
						R. Temporal Pole	1026	-56	-2	-1	-6.151
						R. Cuneus	1026	-8	71	21	-6.217
						R. Middle Temporal Gyrus	810	-53	2	-19	5.499
						L. Superior Temporal Gyrus	702	50	-2	-1	-6.16
Black Middle						***White Middle***					
R. Lingual Gyrus	134136	-5	83	-13	16.027	R. Lingual Gyrus	135324	-5	83	-13	14.608
L. Middle Orbital Gyrus	14688	32	-50	-4	-8.844	R. Inferior Parietal Lobule	8262	-47	56	45	-10.535
R. Precentral Gyrus	8505	-44	5	30	8.365	R. Precentral Gyrus	7344	-44	2	30	8.47
R. Inferior Parietal Lobule	5535	-50	59	36	-8.566	R. Posterior Cingulate Cortex	5238	-2	29	21	-7.469
R. Middle Cingulate Cortex	3888	-2	26	24	-8.746	L. Angular Gyrus	4482	47	65	36	-7.337
L. SupraMarginal Gyrus	3078	59	38	30	-5.658	R. Superior Orbital Gyrus	3753	-8	-47	-19	11.814
L. Medial Temporal Pole	2268	35	-17	-25	8.659	R. Anterior Cingulate Cortex	2727	-5	-35	9	-6.136
L. SMA	2025	2	2	51	7.509	R. ParaHippocampal Gyrus	2322	-17	5	-19	7.878
L. Middle Frontal Gyrus	1998	32	-17	39	-10.094	L. Superior Temporal Gyrus	1566	53	2	3	-5.783
R. Middle Frontal Gyrus	1944	-26	-32	39	-5.978	R. Temporal Pole	1539	-53	-2	-1	-8.377

Table A-30 Continued

	mm^3	x	y	z	t-score		mm^3	x	y	z	t-score
Black Middle						***White Middle***					
L. Precentral Gyrus	1107	50	5	42	4.67	L. Precuneus	1512	17	41	6	-6.322
R. Precuneus	972	-20	44	9	-5.201	L. SMA	1512	-2	-2	45	6.849
L. Rectal Gyrus	891	-2	-32	-16	6.2	L. Precentral Gyrus	1431	47	11	51	4.715
L. Calcarine Gyrus	810	11	62	15	-4.749	L. Superior Parietal Lobule	972	20	68	48	4.311
L. Inferior Parietal Lobule	783	29	59	39	4.429	R. Middle Frontal Gyrus	864	-26	-32	42	-4.696
L. Inferior Temporal Gyrus	675	59	32	-19	-5.001						
R. Middle Temporal Gyrus	675	-50	47	3	4.598						
R. Inferior Temporal Gyrus	648	-65	32	-16	-5.375						
Non-human Pleasant						***Non-human Unpleasant***					
R. Lingual Gyrus	132462	-5	83	-13	17.628	R. Lingual Gyrus	142614	-5	83	-13	16.73
L. Inferior Frontal Gyrus	10611	44	2	27	7.035	L. Inferior Frontal Gyrus	14472	50	-26	15	9.782
R. Angular Gyrus	6453	-50	65	33	-7.491	L. Cuneus	10719	-2	68	24	-8.398
L. Cuneus	6318	2	71	27	-6.978	R. Mid Orbital Gyrus	10368	-5	-44	-1	-7.579
R. Precentral Gyrus	5292	-44	5	30	7.125	R. Precentral Gyrus	10341	-44	5	30	7.133
R. Precuneus	2133	-11	71	48	5.353	R. Angular Gyrus	3348	-47	62	36	-6.302
R. Mid Orbital Gyrus	1809	-2	-35	-1	-5.876	L. SMA	2322	-2	-5	45	6.369
L. SMA	1620	-2	-2	45	5.183	L. Pallidum	891	8	2	6	4.948
R. ParaHippocampal Gyrus	1107	-20	5	-22	5.926	R. Inferior Temporal Gyrus	783	-65	29	-16	-5.851
R. Middle Frontal Gyrus	1107	-26	-29	45	-6.508	L. Superior Parietal Lobule	675	23	71	51	4.231
R. Inferior Frontal Gyrus	1080	-47	-35	15	5.481						
R. Middle Temporal Gyrus	1053	-65	26	-10	-6.905						
R. Fusiform Gyrus	864	-32	5	-37	6.105						
L. Superior Temporal Gyrus	837	44	17	3	-8.68						

Note: Anatomical Locations are based on nearest voxel coordinates on the Eickhoff-Zilles atlas (AFNI's CA_N27_ML Atlas). Peak activation is reported in Talairach coordinates (RAI). Uncorrected $p < 0.005$, corrected $p < 0.05$

Table A-31 Regions of activation elicited by the conditions (vs. the fixation cross) in ROI analyses

Volume (mm^3)	x	y	z	Maximal t-score
MPFC				
Black Upper:				
1269	-5	-53	-13	6.625
White Upper				
1674	-5	-50	-13	5.549
White Middle				
2106	-2	-53	-16	6.604
White Lower				
1107	-2	-53	-16	5.432
Right Amygdala				
Black Upper				
702	-29	2	-19	5.023
Black Lower				
837	-26	-2	-19	5.592
Black Middle				
486	-26	2	-16	4.818
White Upper				
567	-29	2	-19	5.114
White Lower				
351	-26	2	-16	5.935
White Middle				
459	-29	2	-19	3.586
Non-human Unpleasant				
1107	-29	-2	-19	6.259
Left Amygdala				
Black Upper				
702	20	2	-19	6.549
Black Lower				
459	20	2	-16	5.024
Black Middle				
513	20	5	-16	4.763
White Upper				
405	20	5	-16	6.336
White Lower				
324	20	5	-19	5.123
White Middle				
243	20	2	-19	3.804
Non-human Pleasant				
729	23	2	-19	7.364
Non-human Unpleasant				
675	20	5	-16	5.061
Right Insula				
Black Upper				
837	-41	-20	-1	4.038
Black Lower				
1080	-44	-14	-4	-3.925
Black Middle				
1539	-35	-11	18	5.728
White Upper				
783	-35	-11	18	4.428
White Lower				
2457	-44	-2	-4	-5.573
White Middle				
2160	-44	2	-1	-5.754
Non-human Pleasant				
1026	-38	-2	18	5.167
756	-38	-17	-7	3.476
Non-human Unpleasant				
2349	-41	-20	-1	5.334
Left Insula				
Black Lower				
1323	35	2	9	-5.187
White Upper				
729	35	-17	-4	3.759
White Lower				
2997	29	-5	9	-6.644
White Middle				
1134	41	8	3	-5.123
Non-human Pleasant				
1647	32	-20	-1	4.456
324	41	-14	3	3.759
Non-human Unpleasant				
2241	32	-20	3	3.759
378	35	2	21	3.759

Note: Anatomical Locations are based on nearest voxel coordinates on the Eickhoff-Zilles atlas (AFNI's CA_N27_ML Atlas). Peak activation is reported in Talairach coordinates (RAI). Uncorrected $p < 0.05$, corrected $p < 0.05$

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