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Assessing the Effect of Race Saliency in Measures of Children's Implicit Bias

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ASSESSING THE EFFECT OF RACE SALIENCY IN MEASURES OF CHILDREN'S IMPLICIT BIAS

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Abstract

The main goal of this study was to determine if race saliency affected responses on implicit measures of racial bias. Including racial labels in measures assessing implicit bias, particularly when presenting two racial groups vs. just one group, may inadvertently cue children that race is an important grouping variable and, in turn, increase the bias they display. We investigated 8- and 13-year old children's performance on the affective priming task (APT), which does not use labels; the single category implicit association test (SCIAT) with Black faces and the SCIAT with White faces, each of which includes only one racial label; and the implicit association test (IAT), which contrasts two racial labels. Results supported the hypothesis that presenting two racial groups relative to one racial group increased bias. A secondary goal of this research was to examine relations between children's bias on implicit and explicit racial bias tasks. Bias displayed on the implicit measures was unrelated, but bias displayed on an explicit task and the IAT was related, perhaps because both measures present two groups within the task. A final goal of this study was to examine whether the amount of other race friends or other race interactions was related to children's implicit and explicit bias. The amount of other race interactions was unrelated, but the amount of other race friends negatively correlated with most of the racial bias measures; the more other race friends a child had, the lower their negative bias toward Black faces. These findings suggest that other race friendships are more predictive of bias than mere contact.

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Background

Discrimination, typically negative behavior toward others based on arbitrary characteristics (Allport, 1954), is an important social issue. Racial minorities who experience discrimination show serious physical health problems (e.g., hypertension), mental health issues (e.g., low self-esteem and heightened stress; Cain & Kington, 2003; Landrine & Klonoff, 1996), impaired cognitive functioning (e.g., Ambady, Shih, Kim, & Pittinsky, 2001; Apfelbaum, Pauker, Ambady, Sommers, & Norton, 2008; McKown & Weinstein, 2003; Salvatore & Shelton, 2007), legal and medical disparities (e.g., harsher sentencing and higher prevalence of cardiovascular disease; Blumstein, 1982; Chae, Lincoln, Adler, & Syme, 2010; Moy, Dayton, & Clancy, 1992; van Ryn, 2002), and lower employment rates and housing issues (e.g., higher mortgage rates; Bergman, Palmieri, Drasgow, & Ormerod, 2012; Dovidio, Kawakami, & Gaertner, 2000; McConahay, 1986). Racial stereotypes and prejudice are indicators of interracial interactions, such as discrimination (Kteily, Sidanius, & Levin, 2011; Mann & Kawakami, 2012; Sekaquaptewa, Espinoza, Thompson, Vargas, & von Hippel, 2003). Racial stereotyping is the act of placing people into a racial/ethnic category and assigning traits and characteristics to its members (Allport, 1954). Additionally, racial prejudice is the attitude a person has, regardless of valence, toward members of a racial group, based solely on their membership to that group (Steele, 1997; Swim & Stangor, 1998). The concepts of racial stereotyping and prejudice are often interconnected, and as such we adopt the term racial bias to encompass both meanings. It is important to examine how racial bias develops because these biases can lead to discrimination.

Developmental intergroup theory (DIT) defines four key components for the development of racial bias in children (Bigler & Liben, 2006). The first component is the establishment of psychologically salient (important) person attributes. Children first determine from their environment which features are functionally important cues for grouping individuals. In other words, in order to stereotype someone along a dimension, that dimension must be apparent. In addition to the saliency of the dimension, children must also deem it as being a useful way to categorize others in the social environment. As a result, precursors to racial bias may begin at a perceptual level when the child notices differences in skin tone. By 3 months of age, infants have accumulated enough experience within their environment to show a preference for familiar race faces (Kelly et al., 2005).

The second component of DIT states that children categorize encountered individuals along a salient dimension (Bigler & Liben, 2006). When children make these functional distinctions (e.g., note differences in skin color), they classify others using these dimensions. For instance, when children meet a new person, they place and label the person into a particular category that is already salient and meaningful to them. Labeling and the implicit and explicit use of a category increases its salience (Bigler, Jones, & Lobliner, 1997; Patterson & Bigler, 2006)

The third component discusses the development of racial bias along these salient dimensions (Bigler & Liben, 2006). Once people have been placed into salient groups, children allocate traits and characteristics to the group and form a personal attitude about the group. For instance, a new group is assigned traits such as lazy and selfish and the child forms a personally negative view of that group. The fourth component of DIT

discusses the application of a filter created by established groups. Children may filter people through these categories to either reinforce their stereotypes or to forget the encountered person when that person does not conform to the stereotype (Bigler & Liben, 2006).

The tenets of DIT also fit well with theories from evolutionary psychology. One overarching theme in evolutionary analyses is that patterns derived from the environment guide humans to determine which cues or traits are important to attend to (Kurzban, Tooby, & Cosmides, 2001), and evolutionary processes shape humans to act in certain ways in certain environments (Fishbein, 2002). The fastest way to distinguish who is a friend and who is an enemy is to ascertain similarities and differences among others (Posner & Keele, 1968; Reed, 1972; Rosch & Mervis, 1978) through categorizing and reasoning about them (Hirschfeld, 1996). Three overarching theories describe how these evolutionary processes shape human behavior.

First, encoding race may stem from cognitive mechanisms used to detect similar others in the environment (Kurzban et al., 2001). Differences based on sex and age (Cosmides, Tooby & Kurzban, 2003), two very salient cues (Hirschfield, 1996), may have been important for predicting alliances (Kurzban et al., 2001) based on the relation between salient cues and behavior. Because of traveling further distances and encountering new groups of people, this differentiation extended the mechanism used to group age and gender to also group people by other perceptual similarities, such as skin color (Kurzban et al., 2001). Associations between a target's behavior and appearance are flexible, though, suggesting that cues in one context (e.g., socializing) may not be important predictors of alliance in another context (e.g., competing). Therefore, reliance

on race-based cues to determine alliance should not be static or fixed; they should be context dependent.

Second, a reasoning heuristic about natural kinds based on essentialism (Gil-White, 2001) may also account for encoding race. Essentialism is the idea that some attributes are always present and provide the basis for identity (Cartwright, 1968; Gelman, 2004). The belief that an underlying, unknown, difference exists between males and females is an example of essentialism (Gelman, 2004). Essentialists views tend to become more differentiated with age (Taylor, Rhodes, & Gelman, 2009), and may be influenced by the environment. For example, asking questions about one race independently of another might bring to mind a different social context than asking questions about two races simultaneously.

Finally, encoding race may simply be a side effect of detecting correlations in the environment (Taylor, Fiske, Etcoff, & Ruderman, 1978). The brain evolved to determine patterns, such as shape and color, to organize the world. Because humans live in societies with populations varying in skin tone, or at the very least see various faces through media outlets, mechanisms designed to detect correlations may be picking up differences in skin tone and face shape.

From evolutionary theories and DIT, we know that children examine their environment to determine the important elements. When measuring children's racial stereotyping and prejudice, it becomes important to determine if the tasks researchers use make race salient and functional within the testing environment. Some methods use a dichotomizing situation to study racial bias by presenting only two groups and asking the child to choose only one answer. This scenario may promote race saliency as compared

to other methods that present only one group at a time or allow children various answer options. If children are assessing the environment for clues to determine what is important, as is proposed in DIT, then making race functional might cue children that race is a significant indicator to use in some way. Lessening race salience could help researchers discover whether or not children actually use race in a functional manner outside of the testing context. The purpose of this study was to examine the methods used to measure racial bias in childhood and if results differed as a function of race saliency.

Measuring Racial Stereotyping and Prejudice

Researchers use a variety of methods to investigate children's affect towards various races including both explicit (e.g., Bernat & Balch, 1979; Corenblum, 2003; Kurtz-Costes, DeFreitas, Halle, & Kinlaw, 2011; Pauker, Ambady & Apfelbaum, 2010; Williams & Davidson, 2009) and implicit measures (e.g., Baron & Banaji, 2006; Cvencek, Greenwald, & Metlzoff, 2011; Degner & Wentura, 2010; Rutland, Cameron, Milne, & McGeroge, 2005). With explicit measures, researchers assess how children feel about, group, or sort individuals via the use of dolls (e.g., Burnett & Sisson, 1995), line drawings (e.g., Ballard & Keller, 1976; Katz & Seavey, 1973) or photographs (e.g., Apfelbaum et al., 2008) of individuals varying in skin tone. With implicit measures, researchers indirectly assess racial bias by measuring how quickly children categorize photographs of people who vary in skin tone with positive and negative adjectives or pictures (e.g., Cvencek et al., 2011) or categorize positively and negatively valenced pictures of objects directly after briefly viewing pictures of people from different races/ethnicities (e.g., Degner & Wentura, 2010). For categorization tasks, if the reaction time when categorizing two items (e.g., White and positive adjectives or pictures) is

faster than when categorizing other items (e.g., Black and positive adjectives or pictures), then the first association is more robust. With priming tasks, if the reaction time is faster for positive pictures (e.g., birthday cake) when proceeded by a particular race face (e.g., Black) as compared to when that race face comes before negative pictures (e.g., spider) then the first association is more robust.

Explicit tasks. The earliest documented measure of explicit bias still used today is the doll task (Clark & Clark, 1947). The authors designed a set of dolls to determine Black and White children's attitudes towards both their own race and another race. They presented preschool aged children with two dolls, one Black the other White, and asked children several questions (e.g., Who is the nice doll?, Who is the dirty doll?). Clark and Clark (1947) concluded that White children, as well as Black children, favored the White dolls. The limited number of dolls available for selection may have promoted race saliency in the task.

Lerner and Schroeder (1975) examined whether allowing more than one doll selection would garner different results. They assigned White kindergarteners into one of three groups. The first group completed a standard doll task wherein they could choose either one White doll or one Black doll after each question, much like the original doll task. The second group picked from among five Black and five White dolls. For this group, the questions from the original doll task were altered to refer to a group. Researchers asked children to select the dolls that were "nice" and allowed them to make as many selections from the 10 dolls as the children wanted. Researchers may have reduced the saliency of race by allowing children to select any combination of dolls to answer the questions posed. A third group answered open-ended questions about racial

stimuli to see the way they described them. The first group replicated Clark and Clark's findings; the White kindergartners demonstrated a preference for the White dolls over the Black dolls. The second group chose a variety of combinations among the dolls in response to the questions except when asked, "Who is the clean doll," or "Who is the dirty doll." For these questions, children more often chose the White dolls as clean and the Black dolls as dirty. One caveat was that children did not select *only* White or *only* Black dolls for this dichotomous concept; they chose mostly White dolls for clean and mostly Black dolls for dirty. The third group's responses shed light on the thought processes behind selections. They provided concrete, neutral statements about the stimuli suggesting that they did not think of the dolls in constant terms, such as nice or stupid. As this study demonstrated, limiting choices may have promoted race saliency and produced racial bias, whereas providing more options appeared to diminish race saliency because children responded with less racial bias.

Social preferences based on race familiarity may not appear until children are 5 years old. Kinzler and Spelke (2011) studied White 2.5- and 5- to 6-year-olds' race-based social preferences for White and Black individuals. In one experiment, 2.5-year-olds offered a toy to either a White or Black individual. In another experiment, 5- to 6-year-olds saw a Black and White individual displayed on the screen and selected the person they would prefer to have as a friend. The 2.5-year-olds did not show a preference between the two individuals, but the 5- to 6-year-olds preferred the familiar race adult. This outcome suggests that the older children used race in a functional way to make a decision between choosing either a White or Black individual as a friend.

When given the option to play with a Black child who spoke the same language or a White child who spoke a different language, however, 5-year-olds used language and not race as the determining factor for playmate choice (Kinzler, Shutts, DeJesus, & Spelke, 2009). From birth, infants prefer familiar relative to unfamiliar languages (Moon, Cooper, & Fifer, 1993), whereas they do not show this same preference for race (Kelly et al., 2005), suggesting that language becomes a salient social cue earlier in development compared to race. Taken together, these findings suggest that 5-year-olds may use race in a functional way, but only in the absence of a more salient cue, such as language. Language, or accent, cues may provide additional indications that the person does or does not belong to the child's ingroup above and beyond those cues divulged by race membership alone. Children may be predisposed to rely on language cues to guide their evaluations of new individuals (Kinzler, Dupoux, & Spelke, 2007; Kinzler et al., 2009).

Another way to test racial bias other than the doll task is the preschool racial attitudes measure (PRAM II; Williams, Best, Boswell, Mattson, & Graves, 1975). This task presents 36 pictures of two same-sex people differing only in skin tone. An experimenter tells a story about each picture separately and the child determines whom the story is about by pointing to one of the people in the picture. This measure includes 12 positive (e.g., happy, healthy, wonderful) and 12 negative (e.g., bad, sick, wrong) adjectives used to measure attitudes, and 12 sex-role stories used as filler. Results typically showed White and Black children had a White preference (Augoustinos & Rosewarne, 2001; Clark, Hocevar, & Dembo, 1980; Mabe & Williams, 1975; Williams, Best, & Boswell, 1975). Much like the doll task, this measure offers only two exemplars from which to choose in response to posed questions, likely promoting race saliency and

functionality. It is not difficult for participants to infer that race may be an important factor in determining correct responses (Bigler & Liben, 2007; Kurzban et al., 2001) because skin tone is the only difference between the two pictures children can choose. Offering children more response options might diminish race saliency and therefore be a better measure for ascertaining children's personal use of race.

The multi-response racial attitudes (MRA; Doyle & Aboud, 1995) scale built on the PRAM II and permitted more answer options. This method allowed children to distribute positive and negative attributes to members of the ingroup (i.e., European American), outgroup (i.e., African Americans and American Indians), both, or neither. Allowing for more than one choice or response provided some interesting results (Doyle & Aboud, 1995). Eight-year-olds had more positive associations with the outgroups as compared with the 5-year-olds. The 5-year-olds showed a significant positive bias toward White people as compared to the two outgroups, but 8-year-olds did not show this bias. Additionally, a negative association for the ingroup increased with age but remained the same for outgroups. The ingroup ratings dropped over time to be more in line with the lower outgroup ratings. Including more answer options allowed researchers to see that children's biases for the ingroup became more negative as they aged, while their negative biases for the outgroup remained the same. Instead of providing children only two choices when responding, allowing more choices likely afforded children the opportunity to give answers more reflective of their actual biases. Examining each target group separately may provide similar information.

Asking questions about one race at a time may diminish race saliency and children's functional use of it to answer questions because these types of measures do not

provide a reference to a competing racial group. Black and White 6- to 11-year-olds completed questions on the Black/White evaluative trait scale (BETS; Hughes, Bigler, & Levy, 2007) about different races separately. Researchers presented the children with a series of positive, negative, and neutral adjectives and asked the children, "How many White people are ____?" Children used a five point scale (*4 = almost all, 0 = hardly any*) to fill in the blank. Children answered questions about only one race at a time. Results consisted of four scores: positive assessments of Whites and Blacks and negative assessments of Whites and Blacks. White children displayed similar positive attitudes towards both Blacks and Whites regardless of age. Black children had more positive attitudes towards Blacks than they did toward Whites regardless of age. Asking the questions separately demonstrated that Black and White children respond differently to the questions posed, in opposition of results discussed earlier using the more limiting forced-choice tasks. When forming group attitudes, children are more concerned with their ingroup, so attitudes toward outgroups may be affected more by making comparisons than from actual negative attitudes (Aboud, 2003). Black children may already be using race in a functional manner at 6- to 11-years of age. Conversely, White children may not yet use race in a functional manner at 6- to 11- years of age given that their responses were similar for both Blacks and Whites. Research suggests that some Black parents discuss race and race related issues with their children (e.g., Hughes, 2003; Marshall, 1995), whereas White parents avoid discussions of race (e.g., Katz, 2003). Discussing race may promote awareness and use of race at an earlier age for Black children than for White children.

Children do group pictures of people or dolls using skin color, (Clark & Clark, 1947; Gopaul-McNicol, 1988, 1995), but most studies typically hold all cues constant between stimuli except the attribute of interest (e.g., skin tone). Researchers typically present stimuli in which the age, gender, and even hair color are the same, and the only varying aspect is that of skin tone. A child presented with this set of stimuli is asked to sort the pictures into at least two different piles. As a result of the main difference between the stimuli, the child sorts into light versus dark skin tones. When other cues vary between the groups, researchers find different results. For example, Averhart and Bigler (1997) conducted a classification task with Black 5- to 7-year-olds. Researchers tasked children with sorting pictures that differed in gender, skin tone, age (i.e., children, adults), and facial expression (i.e., serious, laughing) into two groups. Most of the children sorted first by gender and then by age, suggesting that skin tone was not the most salient cue for grouping.

Children younger than 5-years old may not yet understand the implications of people's skin color as it pertains to the society in which they reside (Semaj, 1980). By 4- to 5-years, children can categorize people by skin color (e.g., Clark & Clark, 1947; Gopaul-McNicol, 1988, 1995), but they do not appear to rely on the groupings in a functional manner (e.g., Averhart & Bigler, 1997; Semaj, 1980). Just because a child *can* group items on this dimension does not mean that the child endorses the grouping or holds a conceptual understanding of the group.

DIT states that an important precursor to developing racial biases is categorizing individuals based on race in a functional manner. Highlighting the role of race in a task may increase children's awareness and use of race. Children may perceive differences

based on race, but if the differences are not meaningful to the child, then race is not a salient categorizing dimension (Pauker et al., 2010). To limit race functionality in explicit tasks, researchers should provide dolls/pictures with a variety of skin tones to choose from, increase the number of dolls/pictures in the study (Lerner & Schroeder, 1975), increase response options to include a *both* or *neither* choice (Doyle & Aboud, 1995), or test children using one racial group at a time (Hughes et al., 2007).

Implicit tasks. Similar to explicit measures, implicit measures may also limit a respondent's options and, therefore, have the capacity to promote race saliency. The effects of this limitation have not been fully investigated. Implicit tasks tap into a person's unconscious associations between racial groups and positive/negative concepts (Greenwald, McGhee, & Schwartz, 1998). In explicit measures, respondents may alter their answers in order to please the experimenter or to make themselves look good (i.e., social desirability). In implicit tasks, participants are less likely and less able to regulate their responses making these types of measures ideally suited to discern attitudes about socially sensitive topics, such as race. It is important to determine if implicit measures of stereotyping and prejudice promote race saliency and the effect this saliency may have on participants' responses. If a task makes race salient, then children may display inflated levels of stereotyping and prejudice as compared with tasks not highlighting the saliency.

Unlike explicit measures, the most prevalent implicit measures are newer and have less of a historical background from which to draw. The most widely used implicit measure, the Implicit Association Test (IAT; Greenwald et al., 1998), has been used with children, adolescents, and adults (e.g., Baron & Banaji, 2006; Chang & Mitchell, 2011; Degner & Wentura, 2010). The IAT determines the strength of the relation between two

concepts (e.g., White faces and positive adjectives). In a typical procedure, adults view stimulus words (e.g., good, beautiful, evil, horrible) and categorize the words as positive or negative by using computer key presses. Participants complete a total of seven blocks of 30 trials and categorize the serially presented stimuli by pressing one key to classify one set of items (e.g., D) and another key to classify another set of items (e.g., K). Participants respond as quickly as possible and reclassify incorrect items. Typically, a red X will appear after an incorrect response, cuing participants to try again.

During the first block, participants see only pictures of Black and White faces presented serially on a computer monitor and must press one key (e.g., D) if the face is White and another key (e.g., K) if the face is Black.

During the second block, participants see only positive and negative adjectives presented one at a time. They press one computer key (e.g., D) if the word is positive and another computer key (e.g., K) if the word is negative. These single aspect tasks serve to familiarize the participant with the task, faces, and attributes. The initial adjective labels in addition to the face labels are counterbalanced across the study. For instance, half of the participants start the study by pressing the D key whenever they see a picture of a White person whereas the other half starts the study by pressing the D key whenever they see a picture of a Black person. Subsequently, half of the participants begin the study by pressing the D key for positive adjectives while the other half press the D key for negative adjectives.

The next two blocks of trials serve as a practice block and then a test block for categorizing all four targets during the same blocks. The participant sees positive adjectives, negative adjectives, Black faces, and White faces presented one at a time. He

categorizes one type of picture stimuli and one type of attribute with a specific computer key press (e.g., positive adjectives and White faces with the D key) and another computer key press for the other picture stimuli and attributes (e.g., negative adjectives and Black faces with the K key).

In the fifth block, the category for the picture stimuli switches corresponding keys. If participants sorted White faces using the D key and Black faces using the K key during the preceding blocks, they now sort the Black faces using the D key and the White faces using the K key for the remainder of the study. Participants first practice this switched categorization without the addition of the adjectives.

For the final two blocks of trials, participants practice with all four target stimuli and then complete a test block using this same pattern from block five. The stronger the association between the face stimuli and the adjective, the faster and more accurately participants respond. If a participant associates White faces with positive adjectives and Black faces with negative adjectives, then sorting using this configuration, whether in the first practice/test blocks or in the second practice/test blocks, will be faster. Researchers compare the various counterbalanced groups to ensure that associations did not occur simply due to the configuration of the first practice/test blocks. Typically, researchers found that White participants showed positive bias for White over Black people (e.g., Dasgupta, McGhee, Greenwald, & Banaji, 2000; Greenwald et al., 1998; Monteith, Voils, & Ashburn-Nardo, 2001; Nosek, Banaji, & Greenwald, 2002).

To study implicit associations among children, researchers modified the adult IAT for use with children. In one version, participants saw children's faces instead of adult faces, heard the words instead of saw the words to account for various reading levels, and

heard the instructions spoken by the experimenter (Baron & Banaji, 2006). Additionally, participants indicated responses using two large, colored buttons instead of the typical keyboard responses that adults used. This modified IAT version was used with children as young as 6-years-old. Participants, regardless of age, responded faster to congruent trials (e.g., White plus positive words) than incongruent trials (e.g., White plus negative words).

The IAT has been used with children as young as 3-years-old to test body shape bias (Thomas, Smith, & Ball, 2007) and with 4-year-olds to test gender bias (Cvencek et al., 2011). These studies utilized touch screens, response button panels instead of keyboards, or reduced the overall number of trials to reduce fatigue. Researchers found that these altered IATs produced interpretable results (Thomas et al., 2007). Cvencek and colleagues (2011) determined that the altered IAT was effective for evaluating children's implicit attitudes without self-report.

One potential issue with the IAT is in the interpretation of results. A typical explanation for positive associations for White faces is that the results automatically indicate a negative result for the other group of faces (e.g., Black faces). A positive association with White faces, however, does not necessarily indicate a negative association with Black faces (e.g., Blanton & Jaccard, 2006; Blanton, Jaccard, Gonzales, & Christie, 2006; Gehring, Karpinski, & Hilton, 2003; Karpinski & Steinman, 2006). Alternative explanations for a positive result in favor of White faces exist. The results could indicate that participants have positive associations for both groups, but the positive associations for White faces are higher than for the Black faces. Results could also indicate a neutral association for Black faces and positive associations for White

faces. This outcome could indicate a negative association for both types of faces, but the association is less negative for White faces than for Black faces. Measuring the strength of associations between positive/negative concepts and only one target may provide a clearer understanding of the pattern of responses.

One way to potentially overcome this issue is to use the single category implicit association test (SCIAT) with children. The method was derived from the IAT and has been used with adults to measure implicit associations, but displays only one target group at a time (Karpinski & Steinman, 2006). In other words, it tests the association of positive/negative adjectives with only one target group (e.g., Black faces) without reference to a competing racial group. This implicit measure is similar in concept to the BETS explicit measure (Hughes et al., 2007). Measuring implicit associations of one racial group independently of another racial group affords researchers the opportunity to understand the strength of the associations without the influence of the other group.

Another potential issue with the IAT is the category labels for sorting the pictures stimuli are overtly stated. By displaying the categories on screen, this measure makes race a salient and functional feature of the study. As such, regardless of age or knowledge of social norms towards minority group members, majority group children consistently show positive bias for their own group when completing this task (e.g., Dunham, Baron, & Banaji, 2006; Dunham, Baron, & Banaji, 2008; Rutland et al., 2005; Sinclair, Dunn, & Lowery, 2005). Conversely, Black 7- to 11-year-olds did not show positive or negative bias for White or Black faces when completing an IAT (Newheiser & Olson, 2012). Black children scored around zero, indicating a neutral attitude towards both groups. In Newheiser and Olson's (2012) study, the Black children's personal bias for their own

group may be at odds with their cultural knowledge of the outgroup (i.e., White faces). Our understanding of the developmental trajectory of racial bias might be improved if we investigate the strength of the relation between faces and attributes (e.g., positive and negative adjectives) using methods that do not use labels and subsequently promote race saliency.

One way to potentially overcome this issue is to use the Affective Priming Task (APT), a method that implicitly investigates racial attitudes without using explicit social labels for the races being studied (Degner & Wentura, 2010). Nine to 15-year-old White German children viewed picture stimuli (e.g., birthday cake, snake) and categorized positive pictures using one computer key press (e.g., D) and negative pictures using another key press (e.g., K). The first block of trials familiarized the participants with the testing situation, the stimuli, and the response keys. Participants received verbal instructions and feedback after each trial from the experimenter.

During the next two blocks of trials, participants saw a prime stimulus (e.g., positive picture, negative picture, neutral picture, Turkish male, or German male) displayed for about 317ms followed by a brief blank screen for about 133ms. The target, either a positive (e.g., ice cream cone) or negative (e.g., snake) picture, was shown for up to 1750ms. Participants categorized the target picture as positive using one computer key press (e.g., D) or as negative using another computer key press (e.g., K). When positive targets follow positive picture primes or negative targets follow negative primes (i.e., congruent stimuli), participants should categorize the target faster than when incongruent stimuli (e.g., negative picture primes followed by positive target pictures) are paired together (Degner & Wentura, 2010).

Regardless of age, the positive and negative picture primes affected target categorization. Participants categorized congruent (e.g., a positive picture prime and a positive target) faster than incongruent trials (e.g., a positive picture prime and a negative target). The face primes did not affect target categorization for the 9- to 12-year-olds, regardless of valence. For example, when seeing a German face before a positive picture, children in this age range did not categorize the target picture faster than when a Turkish face prime was shown before a positive picture. The face primes did, however, affect target categorization for the 13- to 15-year-olds. Without the explicit race label (i.e., German and Turkish), the effects of racial group priming on children's target categorization was not seen until around age 13. Children's implicit attitudes may be affected by the race of facial primes only when they have developed a conceptual understanding that race is a functionally important way to group people within that society.

These findings support the notion that the IAT and APT may be tapping into two different aspects of racial attitudes. The IAT may measure an understanding of societal labels for racial minorities. When a child can represent a social group, they should show evidence of sorting using societal knowledge (Bigler, 1995). For instance, children as young as two demonstrated preferences for their own gender after they naturally developed a perceptual representation for gender (Maccoby, 1988). Children understood that girls and boys were members of different groups, but there was no indication that the children based their same-sex preferences on a conceptual understanding of gender (Maccoby, 1988). Children understood that people can be girls or boys, but they did not

comprehend what it *means* to be a girl or boy. Preferences for race may work the same way.

Degner and Wentura (2010) investigated if a forced categorization of face targets would elicit similar results from children to those found using the IAT. If these category labels promote race functionality, then children should sort congruent pairings (e.g., Turkish or Moroccan with negative) faster than incongruent pairings (e.g., Turkish or Moroccan with positive) regardless of age. Participants categorized the prime pictures using social category labels (i.e., Dutch/ White German or Turkish/ Moroccan) before beginning the standard APT task thus enhancing awareness of racial categories prior to testing. As it turns out, the primes affected participants' responses at all ages. Participants were faster responding to the congruent information than the incongruent information. Making race a functional, salient feature changed results.

Responses on the IAT demonstrated that children, regardless of age, showed a racial bias for the ingroup (e.g., Degner & Wentura, 2010; Dunham et al., 2006; Dunham et al., 2008; Rutland et al., 2005; Sinclair et al., 2005). Response times on the APT were contingent on age; prime faces did not affect children under 12 years old but did for those over 12 (Degner & Wentura, 2010). Using labels, as with the IAT, may promote race functionality whereas not using labels, as in the APT, may diminish race saliency. Typically, when researchers utilize the IAT, they do not include additional implicit measures to compare responses (e.g., Dunham et al., 2006; Dunham et al., 2008; Rutland et al., 2005; Sinclair et al., 2005). Including other implicit measures that present the groups independently of each other may provide unique insight into ingroup and outgroup biases. Thus far, no one has used the SCIAT with children. It, therefore, seems

important to examine whether there are differences in the bias children display when tested with the APT, SCIAT, and IAT.

Predictors of Racial Bias

Socialization experiences may be more influential in refining adolescent's racial bias than children's racial bias (Hoover & Fishbein, 1999). In childhood, parents play an important socializing role in forming children's attitudes and values (Allport, 1954; White et al., 2009). Whether or not parents provide opportunities for cross race interactions may be an important predictor of racial bias in childhood. For adolescents, the socialization role shifts to peers' influence (Allport, 1954; White et al., 2009). As a result, cross race friendships may provide beneficial elements of intergroup contact, including equal group status, common goals, intergroup cooperation, and authority support (Allport, 1954; Pettigrew, 1998). It is important to measure other race interactions and other race friends to determine if one type of interaction is more indicative of racial bias than another and whether it varies during childhood and adolescence.

Previous research shows that children tend to play with peers from the same-race group more frequently than with peers from other race groups (Finkelstein & Haskins, 1983; Fishbein & Imai, 1993). Interpersonal contact, however, may be a mechanism for reducing prejudice and creating good race relations (Cameron, Rutland, Brown, & Douch, 2006). Therefore, the amount of other race friends a child has may be more strongly related to the bias they display on implicit and explicit measures relative to other race interactions.

Age Differences

Determining whether implicit measures truly are measuring racial bias or are eliciting certain responses is important for determining the developmental trajectory of racial bias. Once we have a clearer picture of the developmental trajectory of racial bias, it is important to determine ways in which to reduce racial bias and change external, or explicit, behaviors associated with this bias. Understanding how implicit racial bias relates to explicit measures of behavior can provide guidance for these types of intervention strategies.

Research using explicit measures shows an increase in bias during early childhood until approximately 7 years old (e.g., Duckitt, Wall, & Pokroy, 1999) and a decrease in middle childhood until about 10 years old (e.g., Aboud, 1980; Doyle & Aboud, 1995). An additional increase in racial bias is shown in adolescence (e.g., Augoustinos & Rosewarne, 2001). Adolescents' development of ethnic identity and their awareness of cultural views of race may account for increases in bias at this age. Research using implicit measures, however, shows no age-related changes during this same period (e.g., Banaji, Baron, Dunham, & Olson, 2008; Baron & Banaji, 2006) possibly due to implicit biases being automatized and more resistant to changes (Degner & Wentura, 2010). We will compare bias displayed on explicit and implicit measures for 8-year olds (middle childhood) and 13-year olds (adolescents). It is possible that our manipulations of racial saliency will impact displays of children's biases during both middle childhood and adolescence, but the strength of the biases may be somewhat stronger during adolescence due to their greater exposure to cultural stereotypes.

It is important to investigate age differences in racial bias to develop age appropriate intervention strategies (e.g., Killen & McKown, 2005). If measures are

prompting responses that are not indicative of children's true feelings toward a racial group, then these results can lead researchers to make erroneous conclusions. Incorrect conclusions can produce ineffective interventions.

Overview of the Current Study

The main goal of this study was to determine if race saliency affected responses on implicit measures of racial bias. If a measure promotes race saliency, children may demonstrate higher levels of bias, which, in turn, affects interpretations that can be made from the data. To more closely study the effects of race saliency on response times, we examined the same children's reaction times on the affective priming task (APT), two single category implicit association tests (one with Black faces only and one with White faces only), and the implicit association test (IAT). We manipulated the saliency of race by having labels present (IAT) or not present (APT) in the study. We also manipulated race saliency by presenting one race target at a time (SCIAT) as compared with presenting two race targets at a time (IAT), with the latter method being more likely to promote race saliency.

We expected racial bias to be evident at all ages for the IAT because this task presents both explicitly stated labels and two groups within the same task. The first component of DIT (Bigler & Liben, 2006) states that children determine from their environment which features are functionally important. The IAT's use of race labels likely serve as an indication to children that race is an important factor and should be used. The added component of using two groups within the study should further highlight that race is an important cue to which to attend. These cues may activate knowledge and

cultural biases about racial groups, even if the person does not endorse these biases personally. It may be this activation that drives responses on the IAT.

We also predicted that response times on the APT would differ based on age. If the results from Degner and Wentura's (2010) study are generalizable, 8-year-olds should not show differences in response times to congruent trials (i.e., White faces + positive objects) and incongruent trials (i.e., White faces + negative objects). Even though this measure does not use explicit labels, adolescents' emerging cognitive capacities for understanding the conceptual importance of ethnic identity and the meaning of differences between groups may make race functional and salient (Erikson, 1968). Therefore, 13-year-olds should show faster response times for congruent than incongruent trials.

It was less clear how the SCIAT would affect children's reaction times and whether there would be age differences. Based on DIT, children assess the situation for important cues to use. Presenting the race targets separately, but with labels, might prompt children's functional use of race, regardless of age, although such functionality might be lessened in the SCIAT compared to the IAT measure. Moreover, including separate SCIATs allowed us to examine whether children showed positive ingroup bias, negative outgroup bias, or both.

A secondary goal of this research was to examine relations between measures of implicit and explicit racial bias. If bias measures tap the same constructs, we expect to find a positive correlation within and between the two types of measures. Past research indicates conflicting results. Some studies suggest that implicit and explicit racial bias measures are tapping into different constructs (e.g., Dovidio, Kawakami, Johnson,

Johnson, & Howard, 1997; Greenwald et al., 1998; Karpinski & Hilton, 2001), whereas other studies reveal that these types of bias measures are related (e.g., von Hippel, Sekaquaptewa, & Vargas, 1997; Wittenbrink, Judd, & Park, 1997). Due to the conflicting results and because we included different implicit racial bias tasks, it was important to determine if an explicit measure would relate to any or all of these measures.

A final goal was to examine how other race friendships and interactions relate to bias scores derived from the various measures. We expected that as the number of other race friendships increased, children would show less implicit and explicit bias. These friendships may lead to an increased acceptance of and positive associations with other race individuals that are evident in both implicit and explicit tasks (Karpinski & Hilton, 2001).

This study contributes to the field of racial bias research in several ways. It is the first study to date that has utilized the single category implicit association test with children. It attempts to generalize findings from Degner and Wentura's (2010) study conducted in a more homogenous area (Germany) to a more diverse area (Las Vegas). It examines whether using race labels and presenting two racial groups vs. one racial group in implicit measures increases bias due to the increased saliency of race in these tasks.

Chapter 2: Method

Participants

Participants included 8- and 13-year old children who did not self-identify as African American or Black (N = 84, 43 females, 41 males) from the Las Vegas area. The area is more diverse (46.1% White, not Hispanic or Latino; 30% Hispanic or Latino; 9.6% Asian; 11.5% Black or African American; 2.8% other race or more than one race) than is typically reported on broader census surveys (62.6% White, not Hispanic or Latino; 17.1% Hispanic or Latino; 5.3% Asian; 13.2% Black or African American; 1.8% other race or more than one race; U.S. Census Bureau, 2015a; U.S. Census Bureau, 2015b). We recruited children via established databases, community functions (e.g., children's festivals), and social media. Research assistants emailed families of eligible children and followed up with phones calls. We deleted data for a particular measure when the child had error rates higher than 20%, which resulted in the following deletions: APT (n = 13); SCIAT with Black faces (n = 5); SCIAT with White faces (n = 1); and IAT (n = 3). For data kept in the study, the error rates were consistent with or lower than those observed in previous studies (e.g., Degner & Wentura, 2010; Karpinski & Steinman, 2006; APT = 7.45%, SCIAT with Black faces = 6.13%, SCIAT with White faces = 5.24%), except the IAT, which was higher (IAT = 7.96%). Due to unbalanced sample sizes with the 8-year-olds as a result of high error rates on the APT, we added the data from four additional pilot children for the analyses. The procedure for the APT was the same for the pilot study and adding pilot children did not change the results; it just increased power. See Table 1 for sample sizes for each measure by age. For their involvement, children chose either a small prize or entered a raffle to win a larger prize.

Table 1

Sample Sizes by Age for Each Implicit Measure

Age	APT	SCIAT with Black faces	SCIAT with White faces	IAT
8 years	35	39	42	40
13 years	40	40	41	41

Stimuli

Face stimuli. We selected facial images of 60 Black and 60 White children from a larger set of 480 black and white photographs obtained from yearbooks. Yearbook photos are considered public, archival data and do not require subject or parental permission for their use. We used third, fourth, eighth, and ninth graders' pictures taken from 2000 to 2012 in Texas, South Carolina, and Nevada and selected pictures with mostly front facing poses. We standardized pictures by cropping them just below the chin and just above the head. Pictures were approximately 225 X 225 pixels. Separate groups of undergraduate students from the university's subject pool rated the faces for three attributes. Participants rated race typicality using a 7-point scale (1 – *not very typical of African Americans*, 7 – *very typical of African Americans*). We substituted the word Caucasians when participants rated pictures of White faces for race typicality. Participants used a different 7-point scale to rate emotional expression (1 – *very negative expression*, 7 – *very positive expression*). For attractiveness ratings, participants used a separate 7-point scale (1 – *not very attractive*, 7 – *very attractive*). See Table 2 for number of raters and interrater agreement. Using these ratings, we selected faces matched on race typicality (White faces: $M = 5.92$, $SD = 1.18$, Black faces: $M = 5.71$, $SD = 1.27$), emotional expression (White faces: $M = 4.41$, $SD = 1.16$, Black faces: $M = 4.43$, $SD = 1.38$), and attractiveness (White faces: $M = 3.74$, $SD = 1.49$, Black faces: $M = 3.73$, $SD = 1.50$) to circumvent the likelihood that these cues could account for differences in

priming or categorization rather than the race of the face (Craig, Lipp, & Mallan, 2014). Ratings of race typicality, emotional expression, or attractiveness did not statistically significantly differ among the four measures, *p*s > 0.05.

Table 2
Number of Raters and Interrater Agreement

	3rd & 4th Graders		8th & 9th Graders	
Face cateogry	*n*	α	*n*	α
Attractiveness	177	0.90	155	0.92
Emotional Expression	220	0.95	171	0.97
Race Typicality	174	0.89	155	0.84

Target stimuli. We selected object stimuli from an existing pool of 200 photographs gathered from the internet. A group of 101 undergraduates rated the objects as positive, negative, or neutral (α = 0.98) using a 7-point scale (1 – *negative*, 7 – *positive*). A group of at least 20 children rated the same photographs as positive, neutral, or negative (α = 0.98) using the same scale. When selecting stimuli, we used pictures that both children and adults agreed were positive (*M* = 6.05, *SD* = 1.19), neutral (*M* = 3.96, *SD* = 0.96), or negative (*M* = 1.60, *SD* = 0.99). Approximately 39 positive (e.g., birthday cake), 39 negative (e.g., insects), and 5 neutral (e.g., stack of paper) pictures were used throughout the study.

Measures

Affective Priming Task (APT). The APT is a priming task that measured the reaction time of categorizing serially presented targets (e.g., birthday cake, snake) as either positive or negative after successive presentation of prime stimuli (i.e., White face, Black face, positive object, negative object, or neutral object; Degner & Wentura, 2010; Fazio, Jackson, Dunton, & Williams, 1995; Fazio, Sanbonmatsu, Powell, & Kardes,

1986). For the stereotype primes, six White and six Black pictures were used. Additionally, 10 positive (e.g., birthday cake), 10 negative (e.g., insects), and 5 neutral (e.g., whisk) pictures were used in this measure. This measure has sufficient validity (Fazio et al., 1995).

Single Category Implicit Association Test (SCIAT). This task measured the associative strength between one object and positive/negative adjectives (Greenwald et al., 1998; Karpinski & Steinman, 2006). One SCIAT included Black faces (three males and three females). A second SCIAT included White faces (three males and three females). To account for differences in children's reading levels and to match other measures used in this study, this experiment utilized positive and negative pictures of objects (e.g., ice cream cone, spider, respectively) instead of positive adjectives (e.g., joy) and negative adjectives (e.g., horrible) displayed on the screen. This test has reasonable test-retest reliability, as well as construct validity (Karpinski & Steinman, 2006).

Implicit Association Test (IAT). The IAT measured the association between a target picture (e.g., Black, White) and an attribute (e.g., good, bad) by utilizing reaction time (Greenwald et al., 1998). Children saw six Black faces (three males, three females), six White faces (three males, three females), ten positive target pictures, and ten negative target pictures. This measure has sufficient validity (Greenwald, Poehlman, Uhlmann, & Banaji, 2009). See Table 3 for a comparison of the block order for the SCIAT and IAT measures.

Social Choices Task. There were six Black and six White faces used in this task. The sex of the faces was matched to the sex of the child. Children were serially presented with two different scenarios. One setting involved sitting at a lunch table and the other

included sitting in a car on the way to a desired destination (e.g., Disneyland). Children saw six same-sex faces (three Black faces, three White faces) across the top of the page and selected three children to sit with them in the car. From a separate set of six faces they selected three children to sit with them at the table. See Appendix A for the layout of each scenario.

Demographic questionnaire. The purpose of the demographic questionnaire was to sketch a descriptive outline of the children. Information collected from the questionnaire included items such as age, sex, race, and number of other race friends and other race interactions. Parents used a 4-point Likert-type scale (1 – *none* to 4 – *many*) to indicate how many other race interactions and other race friends their child had. The higher the number, the more other race friends and interactions the child had. See Appendix B for a list of questions.

Procedure

Research assistants explained the procedure to parents and children before obtaining signed consent and child assent. Children completed the test in a room separate from the parent(s). Parents completed a demographic form during the study.

Bosson and colleagues (2000) determined that presenting explicit measures before implicit measures artificially increased the correlations between these types of measures. Therefore, we presented all implicit measures of attitudes prior to the explicit measures of attitudes, and the implicit measures were presented from least to most racially salient as per the following order: APT, SCIAT with Black faces, SCIAT with White faces, and the IAT.

Table 3

Comparison of the Implicit Association Test (IAT) and the Single Catgory Implicit Association Test (SCIAT)

IAT					SCIAT with Black faces**				
Block	Number of Trials	Purpose	Left mouse click	Right mouse click	Block	Number of Trials	Purpose	Left mouse click	Right mouse click
1	6	Practice	Black faces	White faces					
2	6	Practice	Positive pictures	Negative pictures					
3	30	Practice*	Black face + Positive pictures	White faces + Negative pictures	1	6	Practice	Black faces + Positive pictures	Negative pictures
4	30	Test	Black faces + Positive pictures	White faces + Negative pictures	2	60	Test	Black faces + Positive pictures	Negative pictures
5	6	Practice	White faces	Black faces					
6	30	Practice*	White faces + Positive pictures	Black faces + Negative pictures	3	6	Practice	Positive pictures	Black faces + Negative pictures
7	30	Test	White faces + Positive pictures	Black faces + Negative pictures	4	60	Test	Positive pictures	Black faces + Negative pictures

* labeled as practice but used in data analysis

** SCIAT with White faces replaces the Black faces with White faces

Children completed the APT first because this measure did not use race labels for the face pictures. After researchers explained the study, children completed six practice trials. Using a computer mouse click, they classified a target picture as either good or bad following a brief presentation of a prime picture (i.e., positive object, negative object, neutral object, Black face, White face). Following the practice set of trials, the experimenter asked the child if he or she understood the procedure. After the child acknowledged comprehension of the directions, the experimenter started the test block. The test block contained 68 trials. Thirty-four test trials were congruent (e.g., White face primes before positive objects) and 34 test trials were incongruent (e.g., White face primes before negative objects). The similar trials were shown sequentially (e.g., congruent pairs) before switching to the other type of stimuli pairings (e.g., incongruent trials). Half of the children in each age group saw the congruent trials first and the other half saw the incongruent trials first. Half of the children in each age group categorized the positive pictures using the left mouse button and the other half categorized the positive pictures with the right mouse button. This counterbalanced procedure was consistent throughout each implicit measure.

After the APT, children completed the SCIAT with Black faces. The child completed six practice trials first in which he or she classified the face pictures and positive objects by clicking one mouse button (e.g., left) and the negative objects by clicking the other mouse button (e.g., right). The initial categorization was counterbalanced. Half of the children categorized positive target pictures using the left mouse click and half of the children categorized positive target pictures using the right mouse click. Additionally, the initial face picture pairing was counterbalanced. Half of

the children first categorized the face picture using the right mouse click whereas half categorized the face picture using the left mouse click. Next, children completed 60 test trials identical to the practice trials. After the first set of test trials, the label indicating which side to classify the Black picture changed to the other side of the screen. The children completed six practice trials in which he or she classified the positive words and the face pictures/negative words by clicking the opposite mouse buttons from those used previously. The children then completed 60 test trials.

Children stopped the computer tasks and completed a word search puzzle for two minutes to diminish carryover effects from one SCIAT to the other. They then completed the SCIAT with White faces. The procedure was identical to the SCIAT with Black faces, but showed White faces instead.

After the SCIAT with White faces, children completed the IAT. The IAT was similar to the SCIAT, except it presented both Black and White pictures within the same task. The first set of six practice trials consisted of classifying target stimuli according to race. Pictures appeared one at a time in the middle of the screen and children classified them as either White using one mouse click or Black using the other mouse click. For the second set of six practice trials, children saw positive or negative pictures presented one at a time in the middle of the screen. They classified the words using one mouse click for positive pictures and the other mouse click for negative pictures. These first two sets of practice trials familiarized the child with the stimuli. The next set of 30 practice trials contained both the valenced pictures and the faces. Children saw the face or object pictures presented one at a time and classified them as either good/Black using one mouse click or bad/White using the other mouse click. Children then classified the faces

and targets again in 30 test trials. For the next set of six practice trials, the race labels switched sides. They practiced classifying the White faces and the Black faces using the opposite mouse clicks from those used previously. Then, they completed a final set of 30 practice trials followed by 30 test trials wherein s/he classified the pictures as good/White using one mouse click or bad/Black using the other mouse click.

For each implicit measure, the initial test either showed congruent or incongruent trials. We alternated the pattern in which these trials were first shown. For instance, one child saw congruent trials initially on two measures and incongruent trials for the first test set for the other two measures. Across each implicit measure, children always categorized the positive pictures using one mouse click (e.g., left) and the other mouse button for the negative pictures (e.g., right) to consistently associate one mouse click as positive and the other as negative. Only the face pictures switched sides.

Children completed the social choices task last. The experimenter presented the child with an 8.5" X 11" sheet of paper with six black and white photographs (three Black children, three White children) printed across the top. Both the order of the faces and the specific faces used in a task were counterbalanced. For one scenario, a representation of a lunch table was printed below the faces. For the other scenario, a representation of a car was below the faces. The experimenter asked the child to imagine that s/he had just moved to a new school, and then showed the child where s/he would sit in the car or at the table. The experimenter asked the child to select three people to sit at the table or in the car. When children made their selections, they drew a line from the picture at the top to the corresponding seat.

Data Preparation

We used the updated D-score algorithm to calculate scores on the APT and IAT measures (Greenwald, Nosek, & Banaji, 2003). For the SCIAT, the abbreviated D-score algorithm was used to calculate scores (Karpinski & Steinman, 2006). Using the standardized scoring algorithm allowed us to compare results across measures. See Table 4 for the steps for each tests' transformation including specific error penalties (Step 4). For each of the measures, skewness ranged from |0.16| to |0.48| while kurtosis ranged from |1.06| to |0.01|. Scores fall within the acceptable ranges for both descriptive measures (Tabachnick & Fidell, 2006).

For the APT test trials, we calculated four separate D-scores, one for Black face primes, one for White face primes, one for negative object primes, and one for positive object primes. We used the negative and positive object prime D-scores to check for priming effects for each group and did not use the scores in further data analyses. A child's D-score encompassed the reaction time for correct responses and penalties for incorrect responding.

To assess the implicit association between Black or White faces and positive or negative pictures on the SCIAT, only trials in blocks two and four were scored (Karpinski & Steinman, 2006). A child's D-score encompassed the reaction time for correct responses and penalties for incorrect responding.

To score responses on the IAT, we used practice blocks wherein children categorized Black faces, White faces, positive objects, and negative objects (i.e., blocks 3 and 6). We also used the corresponding test blocks (i.e., blocks 4 and 7). A child's D-score encompassed the reaction time for correct responses and penalties for incorrect responding.

Table 4

D-score Algorithm Process for Each Implicit Test

Step	APT	SCIAT	IAT
1	Separate data from test scores into four subscores: Black faces, White faces, negative primes, positive primes	Use data from B2 & B4	Use data from B3, B4, B6, & B7
2	Eliminate trials with latencies > 10,000 ms; eliminate subjects for whom more than 10% of trials have latency less than 300 ms	Eliminate trials with latencies > 10,000 ms; eliminate subjects for whom more than 10% of trials have latency less than 300 ms	Eliminate trials with latencies > 10,000 ms; eliminate subjects for whom more than 10% of trials have latency less than 300 ms
3	Compute mean of correct latencies for each block	Compute mean of correct latencies for each block	Compute mean of correct latencies for each block
4	Replace each error latency with block mean (computed in Step 3) + 600 ms	Replace each error latency with block mean (computed in Step 3) + 450 ms	Replace each error latency with block mean (computed in Step 3) + 600 ms
5	Average the resulting values for each subsection	Average the resulting values for each of the two blocks	Average the resulting values for each of the four blocks
6	Compute pooled SD for correct trials	Compute one pooled SD for all correct trials for B2 & B4	Compute one pooled SD for all correct trials in B3 & B6; another for B4 & B7
7	Compute differences: picture with negative target - picture with positive target	Compute differences: (face picture paired with negative target) - (face picture paired with positive target)	Compute difference for practice trials and one for test trials: (Caucasian face picture paired with negative target) - (Caucasian face picture paired with positive target)
8	Divide the difference by the associated pooled SD from Step 6	Divide the difference by the associated pooled SD from Step 6	Divide the difference by the associated pooled SD from Step 6
9			Average the two quotients from Step 8

For the APT, positive results on the individual scores indicated a faster response with the positive target and the corresponding prime. For instance, a positive score with

Black faces indicated a faster response time for positive targets when primed with Black faces. Regardless of race, for the SCIAT a negative score indicated faster response times with the faces plus negative targets whereas a positive score indicated a faster response time with the faces plus positive objects. For the IAT, positive numbers indicated positive bias for White faces whereas a negative score indicated a positive bias for Black faces. Scores near zero for all measures indicated a neutral score meaning the children could categorize faces at the same speed if paired with positive pictures or negative pictures.

For the explicit social choices task, we counted the number of White companions a child selected in each scenario. Scores ranged from zero to six.

When coding children's responses regarding their other race friends and other race interactions, the sample sizes were small in the *none* or *few* categories, so we created dichotomous variables. One group contained those participants who had *none, few*, or *some* other race friends or interactions (*some or fewer*), and the other group was made up of those participants with *many* other race friends or interactions.

Chapter 3: Results

Results are presented in three sections. First, we investigated children's racial bias on the various measures and whether race saliency affected responses. Secondly, we examined relations between measures of implicit and explicit racial bias. Last, we examined whether children's age, gender, and amount of other race interactions or friendships predicted their explicit and implicit bias.

Before we conducted our main analyses, we calculated a series of one-way analyses of variances (ANOVAs) using reaction time as the dependent variable to determine if there was a side effect in response rates on the implicit bias tasks. We compared the response times of participants who used the right mouse click to sort good pictures with those who used the left mouse click to sort good pictures. Additionally, we compared the response times of participants who initially sorted the face pictures with the good pictures to those who initially sorted the face pictures with the bad pictures. We did not find any differences between children who used the left mouse click to categorize positive pictures as compared to children who used the right mouse button to categorize positive pictures, all Fs < 1.0. We also discovered no differences in reaction times for children who sorted positive targets on the right and negative on the left as compared to children who sorted positive targets on the left and negative on the right, all Fs < 1.0.

As a manipulation check to determine if children were primed by the negative or positive object primes during the APT task, we conducted one-sample *t*-tests using the D-scores from the APT for the negative targets (M = -0.18, SD = 0.95) and positive targets (M = -0.12, SD = 1.01). Children's scores did not significantly differ from zero on either D-score, ps > 0.10, suggesting that this task did not prime children as it was intended. We

do not report findings with the APT due to this lack of priming, although in the limitations section we discuss possible reasons why priming did not occur.

Children's Implicit and Explicit Bias

To examine whether children's scores on the implicit measures demonstrated bias, we compared D-scores to chance (zero) using one sample *t*-tests. Reaction times on the SCIAT with Black faces did not significantly differ from chance, $p > 0.05$, meaning children categorized Black faces with the same speed when paired with positive pictures as when paired with negative pictures. Children's scores on the SCIAT with White faces significantly differed from chance, $t(82) = 5.05$, $p < 0.001$. They had significantly faster reaction times when White faces were paired with positive pictures than when paired with negative pictures. Children's scores on the IAT significantly differed from chance, $t(80) = 9.56$, $p < 0.001$, meaning they categorized White faces paired with positive pictures faster than when White faces were paired with negative pictures. To determine whether bias was higher on the IAT as compared with scores on the SCIAT with White faces, we conducted an independent samples *t*-test. Scores on the IAT were significantly higher than scores on the SCIAT with White faces, $t(162) = -4.53$, $p < 0.001$, $d = 0.71$. Children had higher, or stronger, positive associations with White faces when presented with Black faces (IAT) as compared to their positive associations with White faces when no other racial group was presented (SCIAT).

To examine whether children's scores on the explicit measure demonstrated bias, we compared the aggregated score to chance (three) using a one-sample *t*-test. Children selected more White companions to sit with them than would be expected by chance,

$t(82) = 6.27$, $p < 0.001$. See Table 5 for means, standard errors, and effect sizes for the various measures.

Table 5
Means, Standard Errors, and Effect Sizes for Implicit and Explicit Measures for All Ages

	M	*SE*	*d*
Implicit Measures			
SCIAT with Black faces	-0.017	0.037	-0.10
SCIAT with White faces	0.184	0.036	1.12
IAT	0.455	0.048	2.14
Explicit Measure			
Explicit Task	3.84	0.14	1.39

To summarize, children showed significant racial bias in all tasks except for the SCIAT with Black faces. As can be seen in Table 5, children's bias showed the largest effect size in the IAT, then the Social Choices Task, and then the SCIAT with White faces. This finding supports our hypothesis that when two racial groups are presented accompanied with labels (IAT), bias is higher than when measuring associations when one racial group is presented with labels (SCIAT) or two racial groups are presented without labels (social choices task). It also demonstrated that when bias toward White and Black faces is measured separately via the SCIATs, children show positive bias toward White faces, but not negative (or positive) bias toward Black faces. Such a difference cannot be demonstrated via the IAT, which tests implicit bias toward both groups simultaneously. Thus, examining children's racial bias using separate SCIATs provides important information that cannot be assessed via the IAT.

Relations between Measures

We conducted Pearson's *r* correlational analyses to examine the relation between scores on the implicit and explicit measures (see Table 6). The SCIAT with White faces was negatively related to the social choices task. Children with faster reaction times for White faces paired with positive pictures chose more Black companions across both scenarios. Reaction times on the IAT were also related to the social choices task. Children with faster reaction times on the IAT when White faces were paired with positive pictures and Black faces were paired with negative pictures chose more White companions across both scenarios. No other significant relations existed between the implicit and explicit measures, all *p*s > 0.05.

Table 6
Correlations for Implicit and Explicit Tasks

	1	2	3	4
1. SCIAT with Black faces	-	0.12	-0.18	-0.05
2. SCIAT with White faces		-	-0.06	-0.28*
3. IAT			-	0.30**
4. Social Choices Task				-

*$p < 0.05$, **$p < 0.01$

Predictors of Implicit and Explicit Bias

We used SAS PROC MIXED to examine whether bias differed on any of the measures based on children's gender (male, female), age (8, 13), other race interactions (some or fewer, many), and other race friends (some or fewer, many). This type of test, as compared with correlation, allowed us to test not only for relations between variables, but for potential interactions between age, sex, other race interactions, and other race friends.

We decomposed any significant interactions by comparing least square means using Tukey-Kramer adjustments.

SCIAT with Black faces. We found a main effect of other race friends, $F(1, 76) = 4.72$, $p < 0.05$, $d = 0.51$. Children with *many* other race friends ($M = 0.08$, $SD = 0.31$) had significantly higher positive scores on the task than children with *some or fewer* other race friends ($M = -0.08$, $SD = 0.32$). Children with *many* other race friends may develop more implicit positive association with Black faces compared with children who have only *some or fewer* other race friends. The main effect of age was not significant, $F(1, 64) = 1.09$, $p > 0.05$. The main effect for gender was not significant, $F(1, 64) = 0.38$, $p > 0.05$. The main effect for other race interactions was not significant, $F(1, 64) = 3.11$, $p > 0.05$.

SCIAT with White face. The main effect of age was not significant, $F(1, 68) = 1.28$, $p > 0.05$. The main effect for gender was not significant, $F(1, 68) = 2.80$, $p > 0.05$. The main effect for other race interactions was not significant, $F(1, 68) = 0.92$, $p > 0.05$. The main effect for other race friends was not significant, $F(1, 68) = 0.14$, $p > 0.05$.

IAT. We found a significant main effect of other race friends, $F(1, 66) = 6.08$, $p < 0.05$, $d = 0.72$. Children with *some or fewer* other race friends ($M = 0.56$, $SD = 0.43$) had statistically higher positive scores on the IAT as compared to those with *many* other race friends ($M = 0.28$, $SD = 0.34$). Children with *some or fewer* other race friends had more positive associations with White faces than Black faces as compared to children with *many* other race friends. The main effect of age was not significant, $F(1, 66) = 3.76$, $p > 0.05$. The main effect for gender was not significant, $F(1, 66) = 0.13$, $p > 0.05$. The main effect for other race interactions was not significant, $F(1, 66) = 0.47$, $p > 0.05$.

Social choices task. There was a significant main effect of other race friends, $F(1, 69) = 6.07$, $p = 0.05$, $d = 0.85$. Children with *some or fewer* other race friends ($M = 4.20$, $SD = 1.17$) chose more White companions than did children with *many* other race friends ($M = 3.25$, $SD = 1.05$). There was also a significant main effect of age, $F(1, 69) = 4.06$, $p < 0.05$, $d = 0.87$. The 8-year-olds ($M = 4.28$, $SD = 1.22$) chose more White companions than did 13-year-olds ($M = 3.35$, $SD = 1.00$). These main effects were superseded by an age x gender x other race friends interaction, $F(1, 69) = 8.88$, $p < 0.01$. Decomposition of the interaction revealed that 8-year-old males with *some or fewer* other race friends ($M = 4.82$, $SD = 1.33$) chose more White companions across the two explicit measures as compared to the 13-year-old males with *some or fewer* other race friends ($M = 3.40$, $SD = 0.83$), $t(69) = 3.23$, $p < 0.05$. The main effect for gender was not significant, $F(1, 69) = 2.03$, $p > 0.05$. The main effect for other race interactions was not significant, $F(1, 66) = 0.76$, $p > 0.05$.

Chapter 4: Discussion, Limitation, and Conclusion

The main goal of this study was to determine if race saliency affected responses on implicit measures of racial bias. In particular, we wanted to determine if labels or the number of groups presented in a task affected response times. Because the data from the APT were not useable, we were able to test only the latter hypothesis. We found that the number of groups presented within a measure was important: Children showed more bias in the IAT than SCIAT. A secondary goal of this research was to examine relations between children's bias on implicit and explicit racial bias tasks. Bias on the implicit measures was unrelated, but there was a significant positive correlation between bias on the explicit social choices task and the IAT and a significant negative correlation between the social choices task and the SCIAT with White faces. This study is one of the first to show a negative relation between explicit and implicit tasks. A final goal of this study was to examine whether bias differed on any of the measures based on children's gender, age, other race interactions, or other race friends. The amount of other race interactions was unrelated to children's implicit and explicit bias. In contrast, the amount of other race friends correlated with the SCIAT with White faces, the IAT, and the social choices task. This finding suggests that amount of other race friends is more predictive of bias than mere contact. Further, we found a significant interaction with age, gender, and other race friends on the social choices task, suggesting that quality interracial interactions are more impactful for some groups than others.

For implicit measures utilizing White faces, children displayed faster associations when White faces were paired with positive pictures. The strength of the association was much larger in the IAT when White and Black faces were presented within the same

measure compared to the SCIAT in which only White faces were presented. Presenting two groups within one measure (IAT) may result in more positive bias for White faces than in measures that present one racial group at a time (SCIAT). Both DIT and evolutionary viewpoints draw attention to the importance of deriving clues from the environment to determine which cues or traits are important to attend to (e.g., Bigler & Liben, 2006; Kurzban et al., 2001). Kurzban and colleagues (2001) suggest that important cues in one context may not be important in another. The differences in reaction times between scores on the IAT and the scores on the SCIAT with White faces support this idea. Although results on both measures indicated a positive bias for White faces, the scores on the IAT had stronger effects. When the White faces were seen in conjunction with the Black faces, the context changed, thus prompting different responses. Pairing two racial groups together may have made race more salient.

The results from the SCIAT with Black faces demonstrated that children in this study did not have negative or positive implicit associations for Black faces. Without including the SCIAT measures, we might have (erroneously) concluded, based on the IAT results, that the children had negative implicit associations for Black faces. IAT results have helped us understand that implicit racial attitudes are present and can be measured in children, but using it in conjunction with the SCIAT can help us understand how the ingroup and outgroup attitudes fluctuate with age or development. Using findings from multiple measures when designing intervention programs may highlight more effective strategies to reduce racial bias in children. For instance, if children display positive associations for White faces using the IAT and positive associations for White faces and neutral associations for Black faces using the SCIAT, intervention programs

may not be needed. Alternatively, different approaches might need to be employed to maintain positive associations and shift neutral associations to more positive ones. If children display negative bias toward both groups, then intervention strategies should address changing perceptions about both groups, not just one group. To further enrich our understanding of how implicit bias develops, the SCIAT may be useful for understanding bias when only one racial group is present, but the IAT could be useful for understanding bias when two racial groups are present.

Developmental research suggests that children, particularly after age eight, are motivated, either externally or internally, to suppress explicit indications of racial bias (Rutland et al., 2005). Despite this finding in other studies, children in our study demonstrated bias for White companions in the explicit social choices task. Completing four implicit racial bias tasks may have taxed children's attention and efforts to control their external responses inadvertently (e.g., Muraven & Slessareva, 2003), thus producing results that reflected their implicit results. Additional research presenting the explicit task first or by itself may provide evidence to support or refute this claim.

Surprisingly, the bias children displayed in the implicit tasks was not related. This finding does not support other studies (involving adults) that typically find that measures presenting one group relate to measures presenting two groups at the same time (e.g., Bar-Anan & Nosek, 2014; Karpinski & Steinman, 2006). The two implicit measures may be activating different associations in relation to Black faces dependent on the context (Gawronski & Bodenhausen, 2006) – one evaluation in isolation (SCIAT) and one evaluation in relation to White faces (IAT). We drew the same conclusion for associations with the White faces. Children's evaluations of the White faces in the

SCIAT were significant, indicating a positive evaluation of this group. When children had to evaluate both groups of faces in the same task (IAT), they may have used a different concept, such as a comparing the two groups instead of thinking about the groups separately, to make evaluative associations. The higher positive mean on the IAT in comparison to the SCIAT with White faces reflects this possibility. Further research is needed to examine contextual influences on implicit racial bias in children and at what age the implicit measures become related.

Although there were no associations between implicit measures, there were associations between the explicit measure and the IAT and between the explicit measure and the SCIAT with White faces. We found a positive association between scores on the social choices task and reaction times on the IAT. Both of these measures present both Black and White faces at the same time, perhaps highlighting race in this context. Children may use the cues to determine that race is functionally important to the situation or task (Bigler & Liben, 2006), resulting in an amplification of positive bias for the majority group.

Surprisingly, we found a negative association between the social choices task and scores on the SCIAT with White faces. Children with faster positive associations on the SCIAT with White faces chose more Black companions to sit with them. Implicit association tasks tap into learned associations that are difficult to control, whereas children can more easily control responses on explicit tasks to produce a socially desirable outcome (Baron, 2015). Children may be socially motivated to show unbiased selections, particularly in the presence of the experimenter (Geen, 1991). For those children with faster positive associations on the SCIAT with White faces, or a bias for the

majority group, the social choices task may provide an opportunity to explicitly choose members of the outgroup to "prove" that they are not biased. An alternative explanation may be that children with positive bias for White faces may also have positive bias for non-White faces. Future studies investigating implicit and explicit tasks may provide further enlightenment of the relation between these types of measures.

Examining predictors of racial bias may provide further elucidation for responses on the various tasks. The amount of other race friends a child had predicted performance on all measures except the SCIAT with White faces. Other race friends may be important for lessening racial bias, regardless of age. Children with *many* as compared to children with *some or fewer* other race friends had more positive associations for Black faces (SCIAT), less positive associations for White faces (IAT), and chose more Black companions in the social choices task. We did not find these same results when examining the amount of children's other race interactions, suggesting that the quality of the contact is important. Increased personalized interactions with racial outgroup members may result in the abandonment of category-based stereotypes (Gaertner, Rust, Dovidio, Bachman, & Anastasia, 1994) because the categories used to segment people are no longer true. For instance, children with more other race friends may not use race to segment people. Because race categories are no longer accurate to use to categorize their friends, they are no longer useful. Moreover, other race friendships may encourage a shift in the cognitive representation of what it means to be "us" and "them" when the "us" category contains members of an outgroup (Gaertner et al., 1994). Finding ways to connect children on a more personal level, instead of via mere contact, may have a greater impact on reducing racial biases in the future.

For responses on the social choices task, the 13-year old males with *some or fewer* friends choose significantly more Black companions across both tasks than the 8-year old males with *some or fewer* friends. Prior research shows a developmental change in the motivation to suppress explicit ingroup bias with children around eight and younger showing more ingroup bias than children over age 10 (Rutland et al., 2005). The presence of the experimenter may have inadvertently triggered external motivations to suppress racial bias for older males in this study who had *some or fewer* other race friends. Due to sample size constraints, conclusions based on these predictors should be made with caution. Future research should more closely examine predictors associated with explicit indicators of racial bias.

Researchers assert that implicit attitudes emerge early in life, around 6 years of age, and remain relatively stable. Previous studies utilizing the IAT found no age effects on this implicit measure (e.g., Baron & Banaji, 2006; Chang & Mitchell, 2011; Degner & Wentura, 2010). Our results support those findings - we found no effects of age for any of our implicit measures. Both the 8-year-olds and the 13-year-olds displayed faster reaction times when the White faces were paired with positive targets. Further research is needed to determine if this stability is due to an essential developmental component of the implicit associative system (i.e., Baron, 2015) or some external mechanism, such as cultural influences.

Limitations

We did not achieve standard priming effects for children on the APT—they did not more quickly categorize objects as positive following a positive prime or more quickly categorize objects as negative following a negative prime. Because children did

not show standard priming effects, we were hesitant to interpret the reaction times for racial primes. The lack of priming may be due to the photos used to prime the positive and negative conditions. Although we took care to use object pictures rated as highly positive or highly negative by both adults and children, the pictures may not have been extreme enough to elicit priming effects, as about only one third of the sample responded in expected ways to these trials. The feedback children received when they gave an incorrect response may have led to weaker priming effects. A meta-analysis of previous evaluative priming studies (Herring et al., 2013) concluded that including feedback might draw attention to mistakes resulting in a weaker priming effect. By including feedback on incorrect responses to more closely mimic the feedback given on the IAT and SCIAT measures, we may have inadvertently increased the awareness of mistakes made during the APT and weakened the effects of the priming technique. Clearly, further research is needed to examine these possibilities.

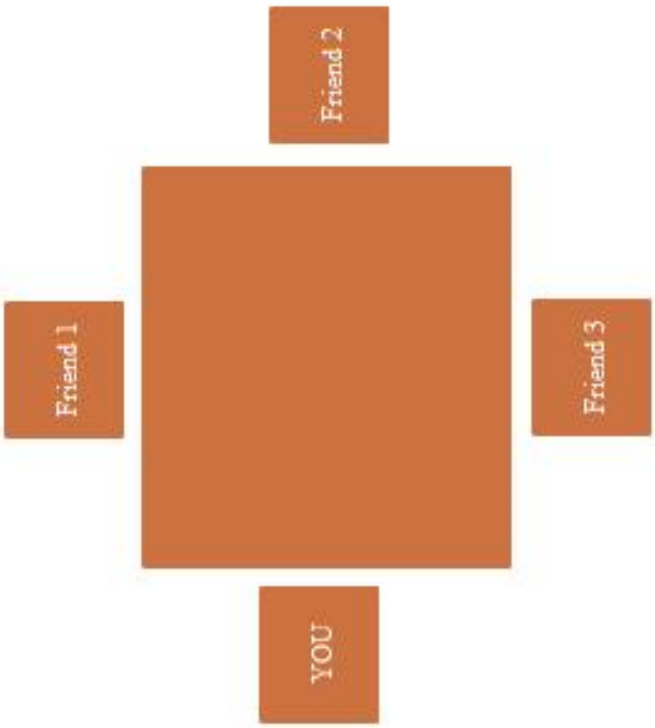
Conclusion

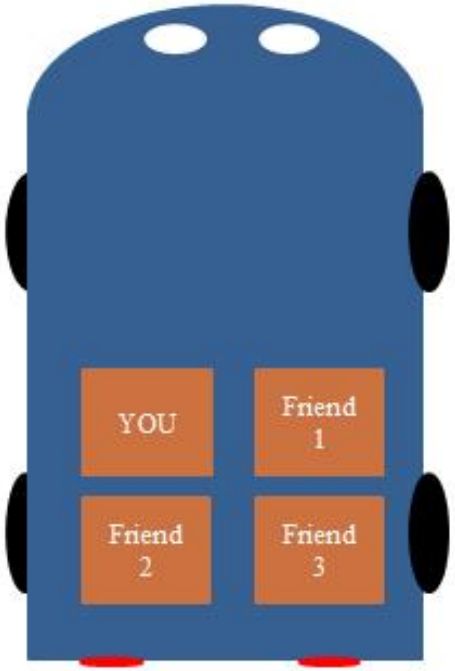
Explicit biases are preferences that a person is aware of and can report. These types of biases are endorsed by the person reporting them. Implicit biases are evaluations that occur outside of conscious awareness and control and are often not endorsed. Because they are outside of conscious awareness, these types of biases can be contradictory to reported explicit biases (e.g., Dovidio, Kawakami, & Gaertner, 2002). This study demonstrated that although these implicit biases are outside of awareness, methodological differences, such as including or not including a competing group, can influence reaction times and subsequent interpretations of racial bias.

Our findings showed that presenting two racial groups (IAT) relative to one group (SCIAT) increased children's bias, presumably because the former task made race more salient. The SCIAT might be useful for understanding bias when only one racial group is present, but the IAT could be useful for understanding bias when two racial groups are present. The separate SCIAT measures demonstrated that children had neutral bias for Black faces and positive bias for White faces, a finding that could not be revealed by using the IAT. The SCIAT measures also seemed to tap into different constructs of racial bias as compared with the IAT scores as evidenced by their lack of correlation. Researchers interested in determining children's implicit attitudes about a particular racial group, but not necessarily in relation to another group, would be well served to incorporate SCIAT measures in their studies.

The amount of children's other race friends has important implications for future studies and intervention strategies. Future research should incorporate the amount of other race friends as a predictor of racial bias. Intervention strategies designed to build friendships with other race peers may facilitate a reduction in racial bias.

Appendix A: Social Choices Task




YOU
Friend 1
Friend 2
Friend 3

Appendix B: Demographic Information Form

Child's gender: M F
Child's age: _____ Date of birth:_____

Are you Spanish/ Hispanic/ Latino?

_____ No, not Spanish/ Hispanic/ Latino
_____ Yes, Mexican, Mexican-American/ Latino
_____ Yes, Puerto Rican
_____ Yes, Cuban
_____ Yes, other Spanish/ Hispanic/ Latino: _____

Race (Please check all that apply)

_____ White
_____ Black or African-American
_____ Asian Indian
_____ Chinese
_____ Filipino
_____ Japanese
_____ Korean
_____ Vietnamese
_____ Other Asian: _____
_____ Native Hawaiian
_____ Guamanian or Chamorro
_____ Samoan
_____ Other Pacific Islander: _____
_____ Some other race: _____

What school does your child attend? _____

How many interactions does your child have with people who are from a different racial/ethnic background?

1	2	3	4
none	few	some	many

How many close friends does your child have with people who are from a different racial/ethnic background

1	2	3	4
none	few	some	many

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Curriculum Vitae

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Education

2015 Ph.D. in Psychology
University of Nevada, Las Vegas – Las Vegas, NV
Dissertation: *Assessing the Effect of Race Saliency in Measures of Children's Implicit Bias*
Advisor: Jennifer L. Rennels, Ph.D.

2010 M.A. in Psychology
University of Nevada, Las Vegas – Las Vegas, NV
Thesis: *Altering Explicit and Implicit Racial Prejudice towards African American Males*
Advisor: Jennifer L. Rennels, Ph.D.

2006 B.S. in Psychology, *Summa cum laude*
Towson University – Towson, MD
Thesis: *Measuring Explicit and Implicit Racial Bias*
Advisor: M. Paz Galupo, Ph.D.

Research Experience

2/2015 – present **Incredible Technologies** Las Vegas, NV
Marketing Analyst

- Develop, design, collect, and analyze slot player data using Excel, SPSS, and Qualtrics; Recruit, design, facilitate, and analyze usability testing with key slot machine players for feedback on a variety of topics
- Collect research data for slot products and analyze key product features and configurations; Research and gather technical and product offerings of competitors
- Gather, research, and use qualitative and quantitative research methods to analyze industry and internal data sources to report trends and findings to the marketing team using SPSS and Excel; Conduct post hoc data analysis as needed using SPSS and Excel
- Maintained databases for performance tracking, analysis, and data verification across a variety of departments and products

8/2012 – 2/2015 **Aristocrat Technologies, Inc.** Las Vegas, NV
Insights Analyst, Marketing

- Gather, research, and use qualitative and quantitative research methods to analyze industry and internal data sources to report trends and findings to the marketing team using SPSS and Excel; Conduct post hoc data analysis as needed using SPSS and Excel
- Develop, design, collect, and analyze slot player data collected in the field using Excel, SPSS, and Qualtrics; Recruit, design, facilitate, and analyze external focus group studies with key slot machine players for feedback on a variety of topics, including concept development but with a concentration on aftermarket feedback
- Facilitate and maintain relationships with key social networking groups
- Collect research data for slot products and analyze key product features and configurations; Research and gather technical and product offerings of competitors
- Collect and verify key gaming data related to analysis, product offerings, and game performance for multiple product categories (e.g., sale games, recurring revenue games)
- Counsel other departments for survey and study design
- Maintained databases for performance tracking, analysis, and data verification across a variety of departments and products

9/2006 – present **University of Nevada, Las Vegas** Las Vegas, NV

Research Assistant

- Design, prepare, manage, and conduct research studies with infants, children, adolescents, and adults using Habit X 1.0, iMovie, SuperCoder, Superlab, and Applied Science Lab 504 eye track system with Gazetracker software, and Qualtrics.
- Conduct data analysis using SPSS and SAS; track data using Excel
- Assist in grant writing; manuscript writing. Currently, the lab is partially funded by the National Science Foundation (NSF).
- Provide feedback on student research proposals
- Create stimuli using a variety of software options, including FantaMorph, Adobe Photoshop Design, and Final Cut Pro
- Prepare, manage, and conduct research projects with adults using Microsoft PowerPoint, Adobe Photoshop, ePrime, and Superlab
- Write protocol for a variety of infant, child, adolescent, and adult studies using Word.
- Hire, train, and manage new undergraduate research members each semester
- Presentation of research data at national and international conferences
- Designed and maintained lab website using Fugu and HTML editor (Taco) – MacIntosh based products; additional experience working with Dreamweaver
- Maintained recruiting database using FileMaker Pro and Excel, limited experience using Access
- Managed laboratory inventory

- Projects:
  - *Measuring Implicit and Explicit Group Perceptions in Children and Adolescents*
    - The purpose of this study is to examine children's reaction times on several different implicit measures of racial bias to ascertain if these measures are tapping into different constructs. It is important to determine that the results researchers obtain and report from these measures are actually due to racial bias and not due to other phenomena, such as stereotype knowledge.
  - *Racial Implicit Bias*
    - The purpose of this study was to examine whether adults exposed to positive behavior messages displayed a change in implicit association for African American males. This study is important because altering these associations may lead to reduced bias and discrimination of this minority group.
  - *Racial Implicit Bias Part Two*
    - The purpose of this study was to examine whether adults' responses to the Single Category Implicit Association Test were altered with and without a researcher present in the room. This research is important to determine the best practices to use when conducting studies using implicit measures.
  - *Infants' Representation of Faces*
    - This study examines whether 5-, 8-, and 11-month old infants' early facial prototypes are a composite weighted more heavily with the faces they most frequently experience (i.e., female) rather than an average of the faces they encounter. This research is important because faces similar to the representation should be processed most easily and therefore preferred. The representation may also guide infants' grouping of individuals as familiar or unfamiliar.
  - *Improving Infant Recognition of Male Faces*
    - The purpose of this study is to examine if increasing 3- to 4-month old infants' experience with male faces affected the development of face recognition abilities for novel male faces. It is important to discover how added experience can guide infant processing of faces. Infants prefer looking at familiar faces because they are easier to process, which may lead to grouping and assigning characteristics.

Teaching Experience

8/2011 – present **Nevada State College**
Henderson, NV
Part Time Instructor

- Teach lecture for up to 40 students; solely responsible for course content and materials
- Assign and grade writing homework, presentations, and exams
- Taught basic terminology and theories in developmental psychology and statistics; experience with hybrid courses (50% online and 50% in person)
- Experience working with a diverse student population: approximately half of the student body at NSC is made up of non-Caucasian students
- Courses taught: Introductory Statistics for Social Sciences, Basic Statistics in Economics, Lifespan Development, Developmental Psychology: Infancy and Childhood, Developmental Psychology: Adolescence and Emerging Adulthood
- Evaluated highly by students for presenting the material in a tangible way and by beng accessible and relateable to the students

1/2009 – 12/2009 **University of Nevada, Las Vegas** Las Vegas, NV

Part Time Instructor

- Prepared syllabus and implemented classroom goals
- Assigned and graded homework, research proposals, and exams
- Taught basic terminology and theories in introductory and developmental psychology.
- Experience working with a diverse student population: UNLV is designated as a Minority-Serving Institution (MSI) by the US Department of Education (Title III and Title V)
- Courses taught: Introduction to Psychology, Developmental Psychology: Infancy and Childhood
- Evaluated highly by students

8/2006 – 5/2008 **University of Nevada, Las Vegas** Las Vegas, NV

Graduate Assistant for Undergraduate and Graduate-level Statistics

- Assisted graduate students with questions regarding homework assignments for statistics
- Graded graduate level homework and provided feedback when applicable
- Assisted professor with grading homework assignments for undergraduate students, mostly using SPSS
- Helped prepare instructional videos for future study, using Captivate
- Assisted in design of website for a proposed study, using Event Handler and Dreamweaver
- Assisted graduate students in learning how to prepare web based studies, using Event Handler and Dreamweaver

Publications in Preparation

Glover, V.A., & Rennels, J.L., Valdez, V. W., & Kamekona, K. (in preparation). Using a learning task to alter implicit associations for african american males.

Glover, V.A., & Rennels, J.L. (in preparation). Comparing measures of children's racial bias: How certain tasks promote functional use of race.

Peer Reviewed Conference Presentations

Glover, V.A., & Rennels, J.L., Valdez, V. W., & Kamekona, K. (2013, January). *Using a Learning Task to Alter Implicit Associations for African American Males*. Poster session presented at the annual meeting of the Society for Personality and Social Psychology, New Orleans, LA.

Glover, V.A., & Rennels, J.L. (2013, March). *Using a Learning Task to Alter Implicit Associations for African American Males*. Poster session presented at the annual meeting of the Graduate and Professional Student Association research forum, Las Vegas, NV.

Glover, V.A., Rennels, J.L., & Kamekona, K. (2011, November). *Using a Learning Task to Alter Implicit Bias*. Poster session presented at the annual meeting of the UNLV chapter of Psi Chi, Las Vegas, NV.

Rennels, J.L., Glover, V.A., Kayl, A.J., & Cummings, A.J. (2010, March). *Improving Infant Recognition of Male Faces*. Poster session presented at the annual meeting of the Graduate and Professional Student Association research forum, Las Vegas, NV.

Rennels, J.L., Glover, V.A., Kayl, A.J., & Cummings, A.J. (2010, March). *Improving Infant Recognition of Male Faces*. Poster session presented at the biennial meeting of the International Conference for Infant Studies, Baltimore, MD.

Rennels, J.L., Glover, V.A., Cummings, A.J., & Kayla, A.J. (2010, March). *How Infants Represent Faces.* Poster session presented at the biennial meeting of the International Conference for Infant Studies, Baltimore, MD.

Rennels, J.L., Kayl, A.J., Cummings, A.J., & Glover, V.A. (2010, March). *Infants Categorize Prototypical Faces by Sex but Rely on Femininity Cues to Categorize Less Prototypical Faces*. Poster session presented at the biennial meeting of the International Conference for Infant Studies, Baltimore, MD.

Other Conference Presentations

Rennels, J. L., Glover, V. A., Cummings, A. J., Kayl, A. J., Orlewicz, M., Tiongson, J. R., Ditzler, B. A. (2011, April). *How Experience Influences Infants' Recognition of Male and Female Faces*. Poster session presented at the University of Nevada, Las Vegas Festival of Communities Research Conference. Las Vegas, NV.

Rennels, J. L., Glover, V. A., Cummings, A. J., Kayl, A. J Orlewicz, M., Corpuz, E. (2010, November). *How Experience Influences Infants' Recognition of Male and Female Faces*. Poster session presented at the University of Nevada, Las Vegas Undergraduate Research Conference. Las Vegas, NV.

Rennels, J.L., & Glover, V.A. (2009, April). *Increased Facial Experience Improves Infant Recognition of Male Faces*. Presented at the biennial meeting of the

Society for Research in Child Development Face Processing Preconference, Denver, CO.

Glover, V.A., & Rennels, J.L. (2009, April). *Improving Infant Recognition of Male Faces*. Presented at the University of Nevada, Las Vegas Psychology Conference, Las Vegas, NV.

Glover, V.A., Rennels, J.L., Kayl, A.J., & Cummings, A.J. (2008, November). *Infant Face Processing*. Presented at the experimental professional seminar meeting in the Department of Psychology, University of Nevada, Las Vegas, NV.

Talks

Glover, V.A., & Rennels, J.L., Valdez, V. W., & Kamekona, K. (2014, April). *Racial Implicit Bias for African American and Caucasian Males*. Presented at the University of Nevada, Las Vegas.

Glover, V.A., & Rennels, J.L., Valdez, V. W., & Kamekona, K. (2013, March). *Using a Learning Task to Alter Implicit Associations for African American Males*. Presented at the annual meeting of the Graduate and Professional Student Association research forum, Las Vegas, NV.

Glover, V.A., & Kayl, A.J. (2010, February). *Baby and Child Rebel Lab.* Presented at the College of Southern Nevada, Las Vegas, NV.

Glover, V.A., Kayl, A.J., & Sandoval, A. (2009, October). *Baby and Child Rebel Lab*. Presented at the College of Southern Nevada, Las Vegas, NV.

Glover, V.A., & Kayl, A.J. (2008, February). *Baby and Child Rebel Lab.* Presented at the College of Southern Nevada, Las Vegas, NV.

Glover, V.A., & Kayl, A.J. (2007, October). *Baby and Child Rebel Lab.* Presented at the College of Southern Nevada, Las Vegas, NV.

Glover, V.A., & Kayl, A.J. (2007, February). *Baby and Child Rebel Lab.* Presented at the College of Southern Nevada, Las Vegas, NV.

Glover, V.A., & Galupo, M.P. (2006, May). *Measuring Explicit and Implicit Racial Bias.* Poster session presented at the Annual Convention for the Association for Psychological Sciences, Washington, DC.

Awards & Grants

March 2013	Graduate & Professional Student Association travel grant awarded for travel to the annual conference for the Society of Personality and Social Psychology ($300).
March 2010	Graduate & Professional Student Association travel grant awarded for travel to the International Conference on Infant Studies, Baltimore, MD ($650).
March 2010	Honorable Mention – *Improving Infant Recognition of Male Faces.* Poster presented at the Graduate & Professional Student Association Research Forum, Las Vegas, NV.

Professional Service

2014 – 2015	Baby and Child Rebel Lab undergraduate mentor

	Experimental Student Committee member
2013 – 2014	Baby and Child Rebel Lab undergraduate mentor
	Experimental Student Committee member
2012 – 2013	Social Psychology Club mentor
	Baby and Child Rebel Lab undergraduate mentor
	Experimental Student Committee member
2011 – 2012	Baby and Child Rebel Lab undergraduate mentor
	Experimental Student Committee member
2010 – 2011	Student Funding Board (Fall Semester Only)
	Experimental Student Committee, cohort representative
	Baby and Child Rebel Lab undergraduate mentor
2009 – 2010	Graduate and Professional Students Association, Secretary
	Chair, Publications committee
	Member, Research Forum committee
	Student Funding Board
	Community Outreach – GEAR UP at Cheyenne High School
	Psychology Graduate Students Association, Co-chair
	Outreach Undergraduate Mentorship Program, mentor
	Baby and Child Rebel Lab undergraduate mentor
2008 – 2009	Graduate and Professional Students Association, Department Representative;
	Member, Research Forum committee
	Member, Publications committee
	Student Funding Board
	Experimental Student Committee, Vice President
	Outreach Undergraduate Mentorship Program, mentor
	Baby and Child Rebel Lab undergraduate mentor
2007 – 2008	Experimental Student Committee, Interview Day subcommittee
	Baby and Child Rebel Lab undergraduate mentor
2006 – 2007	Experimental Student Committee member

Professional Organizations

Association for Psychological Science
Society for Personality and Social Psychology
Psi Chi