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Cross-Cultural Evidence that the Nonverbal Expression of Pride is an Automatic Status Signal

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### Abstract

To test whether the pride expression is an implicit, reliably developing signal of high social status in humans, a series of experiments measured implicit and explicit cognitive associations between pride displays and high-status concepts in two culturally disparate populations—North American undergraduates and Fijian villagers living in a traditional, small-scale society. In both groups, pride displays produced strong implicit associations with high-status, despite Fijian social norms discouraging overt displays of pride. Also in both groups, implicit and explicit associations between emotion expressions and status were dissociated; despite the cross-cultural implicit association between pride displays and high-status, happy displays were, cross-culturally, the more powerful status indicator at an explicit level, and, among Fijians, happy and pride displays were equally strongly implicitly associated with status. Finally, a cultural difference emerged: Fijians viewed happy displays as more deserving of high-status than did North Americans, both implicitly and explicitly. Together, these findings suggest that the display and recognition of pride may be part of a suite of adaptations for negotiating status relationships, but that pride's high-status message is largely communicated through implicit cognitive processes.

**Keywords:** implicit association, pride, social status, signal, adaptation, cross-cultural

Is there a universal nonverbal display that reliably signals high-status in humans?

Extensive evidence suggests that humans possess a small repertoire of pan-cultural nonverbal emotion expressions that are reliably linked to underlying affective states, which may have evolved to automatically communicate these states to observers (see Ekman, 2003; Levenson, 2011, Shariff & Tracy, 2011a; for reviews). Recent studies suggest that this repertoire includes a facial and postural display that is reliably linked to the emotion of pride (e.g., Tracy & Robins, 2004; Tracy & Matsumoto, 2008; Tracy & Robins, 2008a). The pride display may function to automatically communicate not only the expresser's affective state, but also the expresser's (implicit or explicit) belief that s/he merits higher status (Shariff & Tracy, 2009; Tiedens, Ellsworth, & Mesquita, 2000; Williams & Desteno, 2009). Status differences among individuals emerge in all known human societies, even fiercely egalitarian foraging societies, and these differences influence patterns of conflict, resource allocation, cultural transmission, and mating, and often facilitate coordination on group tasks (Ellis, 1995; Fried, 1967). Thus, if pride displays function to reliably signal high status, and do so cross-culturally, they may be part of a suite of evolved cognitive mechanisms for negotiating status relationships.

No previous studies have examined the cross-cultural communicative function of a distinct emotion expression, beyond recognition of the emotion conveyed. That is, although strong evidence exists for cross-cultural recognition of a small set of emotion expressions (i.e., individuals across a wide range of cultures identify emotion expressions using the same emotion labels or emotion-eliciting situations; see Ekman, 2003, for a review), and a large body of work has examined the social functions of emotion expressions within Western cultural contexts (e.g., Ford et al., 2010; Hareli, Shomrat, & Hess, 2009; Hess, Adams, & Kleck, 2007; Keltner & Haidt, 1999; Sinaceur & Tiedens, 2006; Timmers, Fischer, & Manstead, 1998; van Kleef, De Dreu, &

Manstead, 2004), only a handful of studies have examined the presumed evolutionary signals sent by these expressions, by addressing this issue across cultures or even species (e.g., fear displays have been shown to communicate danger in humans and rhesus monkeys; Mineka & Ohman, 2002). This is an important distinction; while cross-cultural, developmental, and comparative (cross-species) evidence demonstrate that emotion expressions *are* likely to be evolved, research on the cross-cultural messages conveyed by these expressions is essential to answering questions about *why* expressions evolved. It is unlikely that humans evolved an ability to automatically and reliably label distinct expressions with distinct emotion words or situations simply for the sake of knowing what emotion a conspecific is experiencing. Rather, the well-documented cross-cultural and early-developing ability to reliably identify distinct emotion expressions is, in all likelihood, a byproduct of an adaptive capacity for inferring fitness-relevant meaning from them. The present research is thus part of an emerging trend of studies testing ultimate explanations for the universality of emotion expressions (see Shariff & Tracy, 2011a).

This work is, essentially, taking the next critical step in emotion-expression research, moving beyond the question of *whether* emotion expressions are likely to be evolved, toward the question of *why* these expressions evolved. In our view (see also Shariff & Tracy, 2011a; 2011b), this *why* question marks the ‘third chapter’ of a longstanding research program on the evolution of emotion expressions, which began with Darwin’s (1872) volume hypothesizing phylogenetic origins of distinct expressions, then leapt forward with Ekman, Izard, and colleagues’ (1969; 1971) seminal research demonstrating the universality of a small set of emotion expressions, and is now continuing with studies testing evolutionary accounts of distinct expressions. This emerging line of research is examining how these expressions function in daily life, why those functions are likely to have been beneficial in evolutionary history, and how those functions are

best accomplished by the specific muscle movements involved in each emotion expression (e.g., Ohman & Mineka, 2001; Susskind et al., 2008; Willowski & Meier, 2010). However, few of these studies have directly addressed this *why* question by testing whether the presumed function of an emotion expression generalizes across diverse populations. Furthermore, no prior work has tested whether an emotion expression operates at an implicit level across populations. The present research thus addresses this third-generation question of the evolution of emotion expressions in a novel manner that is considerably more direct than most studies in this vein. Indeed, the “two-population” approach used here has been characterized as one of the best ways to address questions of universality, which are critical to identifying evolved psychological phenomena (Norenzayan & Heine, 2005).

#### *The Evolution of the Pride Expression*

A growing body of research suggests that a distinct nonverbal display of pride generalizes across diverse populations, and may be a reliably developing component of humans’ evolved emotion repertoire. Pride—the emotion experienced in response to success, achievement, or superiority over others—is associated with a prototypical nonverbal expression (see Figure 1), which shares many of the core characteristics of emotion expressions typically assumed to be evolved: it is recognized quickly and efficiently, and is reliably recognized by children as young as 4-years old and adults from a range of cultures, including non-literate African villagers living in a traditional small-scale society in Burkina Faso, who are unlikely to have learned the expression through contact with other cultural groups (Tracy & Robins, 2008a, 2008b; Tracy, Robins, & Lagattuta, 2005). The pride expression is also spontaneously displayed during pride-eliciting events (i.e., success), by children as young as 3-years old, and by sighted, blind, and congenitally blind adults across cultures—the last of whom could not have learned to

show pride through visual modeling (Belsky & Domitrovich, 1997; Lewis, Allesandri, & Sullivan, 1992; Stipek, Recchia, & McClintic, 1992; Tracy & Matsumoto, 2008). The pride expression thus meets the criteria typically considered necessary to be considered a functional universal—a psychological entity that, by virtue of evolution, universally serves a specific function (Norenzayan & Heine, 2005). Given that pride is typically displayed in the context of a socially valued success, its universal function may involve communicating that success to others, informing them of the proud individual's belief that he/she merits increased social worth and status (Fessler, 2007; Tracy, Shariff, & Cheng, 2010; Williams & DeSteno, 2009). An evolved mechanism along these lines, that automatically and nonverbally communicates perceived status increases, would be adaptive for both observers and expressers. It would allow observers to avoid unnecessary conflicts and efficiently decipher the status hierarchy to correctly pay deference, bias attention, direct cultural learning, form alliances, and seek mates (Martens & Tracy, 2012; Martens, Tracy, & Shariff, in press; Henrich & Gil-White, 2001; Van Vugt, Hogan, & Kaiser, 2008); and expressers to receive the increased fitness benefits associated with high social rank (e.g., Barkow, 1975; Hill, 1984).

Several lines of research are consistent with the hypothesis that pride displays evolved to serve this status-signaling function. First, the pride expression is morphologically similar to non-human primate displays that are thought to communicate dominance, such as the chimpanzee “bluff” display (DeWaal, 1989; Tracy & Matsumoto, 2008), suggesting that pride may have evolved from more ancient displays that helped negotiate and sustain status hierarchies in our primate ancestors. Second, one ethological study found that boys who were judged high in status by their peers tended to show a critical component of the pride expression—erect posture (Weisfeld & Beresford, 1982). Relatedly, a recent experimental study found that participants told

to hold an erect posture showed increases in the hormone Testosterone, which has long been associated with dominance (Carney, Cuddy, & Yap, 2010). Third, another experimental study found that participants manipulated to feel pride (i.e., via positive feedback) were subsequently viewed as “dominant” by their peers in a group task—suggesting that something in their verbal or nonverbal behavior connoted high status (Williams & DeSteno, 2009). Fourth, a recent series of studies demonstrated that North American undergraduates automatically respond to images of pride displays with implicit cognitive associations to high-status concepts (Shariff & Tracy, 2009).

This last finding is based on studies using several implicit assessment methods, including the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998), which measures reaction times (RTs) for categorizing pairs of dichotomous stimuli. By comparing RTs for pairings expected to be associated with RTs for pairings expected to be disassociated, researchers can use the IAT to test hypotheses about mean differences in the relative strength of pairs of associations. Using this approach in the previous studies mentioned above (i.e., Shariff & Tracy, 2009), we compared pride displays’ association with high-status concepts to that of other expressions, by pairing words representing high or low status with photos of an actor displaying pride or some other emotion expression. Based on IAT logic, if participants on average respond more quickly to pride expressions paired with high-status words than pride expressions paired with low-status words, and this difference is smaller (or in the opposite direction) for other emotions, we can conclude that pride is more strongly implicitly associated with high status than those other emotions. In fact, we found the pride expression to be more strongly implicitly associated with high status than every other emotion examined, including shame, happiness, disgust, fear, and anger (all Cohen’s  $d$ s > 2.0). In subsequent research, we found that pride

displays were implicitly associated with high-status concepts even when the targets showing pride were otherwise known to be low status (i.e., by virtue of their position in the social hierarchy; Shariff, Tracy, & Markusoff, in press).

The IAT assesses *automatic* associations, in that differences between average RTs for various stimuli occur largely without intention and are difficult to control (Banse, Seise, & Zerbes, 2001; Bargh, 1994; Cunningham et al., 2004; Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003; Monteith, Ashburn-Nardo, Voils, & Czopp, 2002; but see Conrey, Sherman, Gawronski, Hugenberg, & Groom, 2005). Thus, the findings reviewed above indicate that North American undergraduates have an automatic tendency to associate pride displays with high status. The automaticity of these associations is relevant to our evolutionary hypothesis, because if the pride expression evolved as a pre-linguistic, pre-conscious form of communication, then its perception is a task that brains have been completing for millions of years and thus likely occurs through low-level cognitive processes that can elicit adaptive responses without any need for conscious reflection (Bargh & Pietromonaco, 1982). Such processes have the benefit of causing cognitive and behavioral changes in response to environmental events without any need for conscious thought. If understanding pride's functional message required conscious deliberation, the expression would be less effective as a rapid source of information.

Importantly, this does not mean that implicit responses reflect *only* evolved, genetically programmed cognitions, whereas explicit responses reflect cultural learning; indeed, cultural rules and norms often become automatized and encoded in implicit knowledge structures and affective responses. However, the implicit nature of the IAT allows it, at least to some extent, to bypass strategic impression management processes driven by an awareness of social norms and a desire to conform to them (Banse et al., 2001; Lane, Banaji, Nosek, & Greenwald, 2007). Still,



though the pride expression appears to be an automatic status signal among North Americans, we cannot infer that this is the expression's evolved function on the basis of its automaticity alone (Barrett, Frederick, Haselton, & Kurzban, 2006). Nor can we assume that the cognitive associations of North American undergraduates—who tend not to be representative of the world's population (Henrich, Heine, & Norenzayan, 2010)—are universal psychological patterns. Indeed, given that many Western cultures tend to encourage overt status-seeking and self-aggrandizement (Heine, Lehman, Markus, & Kitayama, 1999), these previous findings may represent a culture-specific learned association. Certain Western populations may have co-opted a universal pride expression, which could have evolved for some other purpose, or as a byproduct of some other adaptation, to serve a culture-specific function related to status enhancement. Thus, to test the hypothesis that pride displays evolved to automatically communicate high status, we sought cross-cultural evidence. In particular, we conducted a “tough test”, by measuring implicit and explicit associations between pride nonverbal displays and high-status concepts in a population that, based on anthropological ethnography, possesses explicit cultural rules that should suppress overt status signaling. Specifically, we conducted a battery of controlled experimental comparisons between villagers in a traditional small-scale society in Fiji, and North American undergraduates. We predicted that, if pride displays evolved to communicate high status, these displays should be automatically associated with high-status concepts even among individuals, such as Fijians, who possess cultural rules prohibiting overt status displays.

### *Fijian Field Site*

Our Fijian research was conducted on Yasawa Island, in the northwest corner of the Fijian archipelago (16°47'34 S, 177°31'05 E), which contains six villages of approximately 100-

350 people each, scattered along the island's 15-mile length. Economically, these communities subsist on a combination yam- and cassava-based horticulture, fishing, and littoral gathering. They are relatively isolated from routine contact with the broader world; there is no broadcast television, internet, computers, public utilities, or postal service (and thus no newspapers or magazines). There are three primary schools, and the nearest market town is a day's journey by boat. The fourth author (Henrich) and his team have been working in these villages since 2003.

Politically, households belong to land-controlling clans, which are organized into *Yavusas* (consisting of roughly 5 clans) governed by a council of elders and led by a hereditary chief. Social relationships and responsibilities are regulated by kinship norms that delineate appropriate behavior among various kinds of relatives. Considering both consanguinal and affinal relations, nearly everyone in the communities is at least socially related to everyone else. Kinship norms regarding interpersonal relationships are premised on one of two principles: strict ascribed status or balanced reciprocity (Sahlins, 1962; Toren, 1990). Relationships based on ascribed status (e.g., older and younger brothers) are vertical, in that the subordinate grants authority, deference, and respect to the prescribed superior. In daily practice, at meals, and in community gatherings, people sit, speak, and drink kava (*yagona*, a mild narcotic drunk at communal rituals) according to a strict protocol based on ascribed status. In same-sex vertical relationships, conversation is practical, respect mandatory, and high-status individuals are not challenged. In contrast, relationships based on balanced reciprocity are horizontal. These relationships are premised on equality; joking is nearly mandatory, and conversations can be practical or whimsical.

The stark importance of ascribed rank in this society results in two features of life: (a) individuals who are not ascribed high-status through the explicit system must not be seen as

arrogating status to themselves through aggrandizement, bragging, or body language, and (b) individuals who are ascribed high-status by the explicit traditional system must avoid personal displays that lord their status over others, and are expected to make explicit efforts to downplay their status. There are numerous prescribed practices and rituals that routinely highlight ascribed status differences without the need for any personal initiative; rank-regulating social norms are exemplified in everyday behaviors seen throughout the communities. For example, all village homes are conceptualized with “high” and “low” ends, and when entering a house, new arrivals sit at a position lower than their actual status accords them, until high-status others coax them to higher-status seats. Even high-status individuals sit in a low-status position when entering another’s house. When moving around inside a house to pass someone who is sitting, people of all statuses crouch low and shuffle along while pleading “excuse me” (*tilou*) to avoid any appearance of vaulting oneself over others. Hats and other headgear are not permitted in villages, as wearing these could be perceived as vaulting oneself above the Chief. The Chief must also avoid wearing hats, as doing so would overly emphasize his (ascribed) superiority. Even in situations where overt displays of pride would be acceptable and expected in Western cultural contexts (e.g., scoring in a rugby game), such displays are shown only subtly. Thus, while spontaneous status displays by low- and high-status individuals are suppressed by local norms, the high status afforded to those with ascribed status roles is routinely re-affirmed, making any nonverbal displays that might communicate a deserved or desired status increase unnecessary. In addition to constantly sitting, drinking, eating, and speaking in status-rank order, the Chief’s house is built on an artificially elevated platform, and male members of the chiefly clan are addressed and referred to with a prefix indicating their higher status (*ratu*).

This cultural system seems configured to suppress both expressions of non-ascribed status, which might compete with traditional chiefly authority, as well as personal displays of dominance by those who hold traditional ascribed status. These individuals are instead encouraged to behave generously and display positive affect toward others, and, because their status is constantly reaffirmed through cultural rules, they can do so without fear of losing their elevated position. In sum, this system makes Fiji a “tough test” of our aforementioned evolutionary hypothesis for pride displays, because nonverbal behaviors that communicate an individual’s belief that he/she deserves increased status would be sharply suppressed by Fijian cultural rules. In other words, because there is a norm in Fiji prohibiting behaviors which might signal an individual’s belief that he/she deserves high status, it is unlikely that Fijians would culturally develop a pride display that effectively communicates high-status. Even if they have retained an innate understanding of the pride display (i.e., that it is associated with feelings of pride), it is hard to imagine that the display would have been co-opted to function as a status signal in a population that suppresses such signals. Thus, if the pride display did *not* evolve as a status signal, there are few cultural explanations as to why status and pride displays would have become associated in Fiji. As a result, evidence that pride displays are associated with high status in this culture would support the argument that status signaling is their evolved function.

The cultural prohibitions against status signaling in Fiji also make it particularly important that we measure *implicit* associations between pride displays and status, because cultural prohibitions may lead Fijians to *explicitly* judge individuals who display pride as undeserving of high status, especially if there *is* an implicit, innate association between pride displays and high status. According to Fijian cultural norms, individuals who display an expression that is associated with high status are violating cultural rules prohibiting overt status

displays, and thus may be judged negatively. Thus, if the pride display is an evolved implicit status signal, we should see a divergence between its implicit and explicit associations with high-status concepts.

### *The Present Research*

In a series of five experiments (Studies 1, 2A, 2B, 2C, and 2D), we measured status judgments or associations of pride displays. In a sixth experiment (Study 3) we conducted a test of pride recognition, to verify that individuals in the Fijian sample could reliably identify the pride expression. In all studies, we also examined status associations (or, in Study 3, recognition) of several relevant comparison emotion expressions: shame, neutral, and happiness. These comparisons were included because the IAT methodology requires that the target of interest (here, pride displays) be compared with some other target, and we sought to include three different kind of comparison targets. First, we included targets that, theoretically, should differ on the construct of interest—status; comparing pride with shame allowed for such a test, given theoretical accounts and empirical findings that shame conveys low-status (Fessler, 2007; Keltner, 1995; Shariff & Tracy, 2009). Second, we included comparison targets that are not theoretically relevant to high or low status: neutral expressions. If pride is found to be more strongly associated with high status than are neutral displays, we can conclude that these associations are due to something about pride, and not to a low-status association of the comparison target. Third, we included targets that would allow us to rule out a possible confound of a positive association between pride and high-status—that it might be due to shared variance in positivity or liking. Including happy expressions provided this control, given that happy displays are assumed to be more positive, and better liked, than pride; we also directly tested this assumption in Study 1. Thus, if participants viewed pride displays as conveying high status

because both pride and the concept of high status are positive states, then happy displays should be viewed as significantly more indicative of high status than are pride displays.

We examined these associations both explicitly, by asking participants to rate the presumed status of a target showing a series of emotion expressions, in Study 1, and implicitly, using the IAT, in Studies 2A, 2B, 2C, and 2D. Measuring status associations at both levels of cognitive processing allowed us to test the specific hypothesis that pride is an implicit status signal—that its high-status message is best perceived when implicit, or automatic, cognitive processes are used. Indeed, previous research suggests that the pride expression more effectively communicates high-status via implicit than explicit processes; when judgments are made explicitly, observers tend to use deliberative resources to discount the high-status message sent by the pride display, and rely more on contextually relevant information about the target's status (Shariff et al., in press). These prior findings necessitate the assessment of implicit perceptions, but by cross-culturally examining explicit judgments as well, we were able to test whether there might be a set of explicit norms about the appropriateness of displaying pride that generalize across cultures. Given that numerous cultures seem to hold norms suggesting that openly displaying or communicating one's pride is not always socially desirable or acceptable (Edelstein & Shaver, 2007; Tracy et al., 2010; Zammuner, 1996), it is possible that pride functions implicitly as a cross-cultural status signal, but, at an explicit level, is more cross-culturally reviled—at least in situations where it is not clearly deserved. The present research addressed this question.

### Study 1

Study 1 examined Fijians' and North Americans' explicit beliefs about whether pride displays convey high-status, compared to several other emotion expressions. Based on our

ethnographic account of Fijian culture, we expected that Fijians would explicitly judge pride displays as not particularly deserving of high status, because if these displays are innately associated with high status, Fijian cultural norms would likely prohibit an explicit appreciation of these associations. That is, because overt status displays are not acceptable in Fijian culture, any nonverbal display that (implicitly) communicates high status should lead to explicit negative and/or low status judgments. For North Americans, we had no clear predictions. On the one hand, several studies suggest that pride displays are associated with high status in North American culture (e.g., Shariff & Tracy, 2009; Shariff et al., in press; Tracy & Matsumoto, 2008). On the other hand, several studies suggest that North Americans view individuals who display pride without corresponding evidence of success as arrogant or hubristic (Tracy & Prehn, 2011), and that when North Americans make explicit judgments of pride displayers, they take into account contextual indicators of status deservedness considerably more than when making implicit judgments of the same individuals (Shariff et al., in press). Thus, it is unclear whether North Americans will explicitly judge decontextualized pride displays as indicative of high status. Study 1 addressed this issue by assessing Fijian and North American judgments of pride, shame, happiness, and neutral expressions, and testing for both between-group (i.e., cultural) and within group (i.e., emotion-based) effects on explicit judgments of each displayer's status and positivity. Positivity judgments were assessed alongside status judgments so that we could test whether perceptions of status were independent from broader perceptions of positivity.

### *Method*

*Participants and procedure.* 103 Fijians (54% female; aged 17-68, *median* = 40; 3-16 years education, *median* = 8) and 103 University of British Columbia (UBC) undergraduates (80% female; 55% Asian, 32% Caucasian, 13% other) viewed photos of a Black North American

male target posing nonverbal expressions of pride, shame, happiness, and neutral (see Figure 1). Limited access to Fijian participants necessitated including only a single target showing all expressions, and, because actual Fijians were not available for posing, we opted to use a North American target whose skin color would closely resemble that of Fijians. However, we also assessed the same explicit judgments in a separate sample of UBC undergraduates ( $N = 56$ ; 64% female; 55% Asian, 25% Caucasian, 20% other) using a Caucasian male target instead of the Black target, to ensure that North American results were not specific to the use of a Black target.

Fijians viewed printed color photos and North Americans viewed color photos on a computer monitor, via the internet. Expression order was randomized between participants. While viewing each photo, participants rated the target on a 3-item status scale and a 2-item positivity scale. For the Fijian sample, these questions were translated into Fijian then back-translated into English to verify translations. Items on the status scale were: “Suppose someone frequently showed this expression, how well respected would this person be?”, “Suppose someone frequently showed this expression, how high-status would people find this person?”, and “How frequently would a high-status person in this community show this expression?”; for all photos, scale reliability was high; all overall  $\alpha$ s  $> .84$ , range = .86-.92 for Fijians and .69 -.79 for North Americans (for Fijian translations of these and all questions in Study 1, see Supplemental Materials at [www.ubc-emotionlab.ca/cross-culturalstatussignals.pdf](http://www.ubc-emotionlab.ca/cross-culturalstatussignals.pdf)). Items on the positivity scale were: “How positive or negative would most people find someone showing this expression?” and, “Suppose someone frequently showed this expression, how likeable would people find him?” Positivity scale reliability was also high for all photos; all overall  $\alpha$ s  $> .88$ , range = .92 -.98 for Fijians and .71 -.80 for North Americans.



Fijian participants were read each of these questions aloud by a Fijian interviewer, and were asked to respond on a 5-point Likert scale ranging from -2 to +2 by pointing to the correct response on a visually displayed number line. Each question was accompanied by a different visual number line with appropriate anchors written in Fijian [e.g., for the first question, anchors were “negative” (*ca*), “somewhat negative” (*viavia ca*), “average” (*sega ni ca se vinaka*—literally, “neither bad nor good”), “somewhat positive” (*ena viavia vinaka*), and “positive” (*vinaka*)]. These anchors were also read aloud by Fijian interviewers. North American participants chose the appropriate response from a 5-point scale with the same anchors in English, by clicking on the button representing the appropriate option in an online survey. To minimize any potential impression management vis-a-vis the presence of Westerners, the Fijian experiment was administered by Fijians. North American participants were compensated with course credit. Fijians participated as part of a long-running relationship with the fourth author’s research, which involves ongoing community gifts in compensation.

*Emotion expression stimuli.* Shame and pride expressions were posed on the basis of previous findings of the distinct nonverbal behaviors reliably associated with each emotion (Haidt & Keltner, 1999; Izard, 1971; Tracy & Robins, 2007; Tracy & Matsumoto, 2008). There are several recognizable variants of pride and shame expressions (Tracy, Robins, & Schriber, 2009); in this study, only one variant of each was included: for pride, we included the version with arms raised above the head, and for shame the version with head tilt down, but no slumped posture (see Figure 1). Happiness was posed using the Directed Facial Action task (DFA; Levenson, Carstensen, Friesen, & Ekman, 1991). The first author, who is trained in the Facial Action Coding System (FACS; Levenson & Friesen, 1978), verified that all expressions accurately conveyed each intended emotion, and that neutral displays conveyed no emotion. For

the follow-up study, on a new sample of North Americans who viewed a Caucasian target, photos were taken from the UC Davis Set of Emotion Expressions (UCDSEE), a FACS-verified set (Tracy et al., 2009).

### *Results and Discussion*

Examining the main results (i.e., responses to the Black target only), we tested for culture and emotion-expression effects on status judgments using a mixed-measures emotion expression (4) x sample (2) analysis of variance (ANOVA). First, an overall main effect of emotion expression emerged on status ratings,  $F(3,196) = 206.32, p < .001$ . The happy expression was viewed as most indicative of high-status, significantly higher than pride,  $t(199) = 13.73, d = 1.25$ ; neutral,  $t(199) = 13.24, d = 1.40$ ; and shame,  $t(199) = 21.92, d = 2.44$ ; all  $ps < .001$ . Pride and neutral expressions did not differ in explicit status ratings,  $t(199) = 1.13, d = .13, p = .26$ , and both were rated significantly higher status than shame,  $t(199) = 8.55, d = 0.99$ ; and  $t(199) = 10.22, d = .85$ , for pride and neutral respectively; both  $ps < .001$ . Second, there was a main effect of sample,  $F(1,198) = 13.12, p < .001$ , indicating that, overall, Fijians tended to make somewhat higher status ratings than North Americans ( $Ms = 0.22$  vs.  $0.01, d = .52$ ).

However, these main effects were qualified by an expression x sample interaction,  $F(3,196) = 8.26, p < .001$ , which, as is shown in Figure 2, revealed that the overall group difference was driven by a group difference in status judgments of the happy expression in particular,  $t(198) = 6.46, d = .91, p < .001$ . This group difference is consistent with ethnographic expectations regarding the need for high-status individuals in Fiji to display happiness; that is, because high-status Fijians are expected to display indicators of friendliness, such as happy expressions, and to *not* display overt status-indicating expressions, such as pride, Fijians may

have come to hold strong particularly explicit associations between happy displays and high status.

There were no significant group differences in judgments of pride,  $t(198) = 0.52$ ,  $d = .08$ , neutral,  $t(198) = 0.26$ ,  $d = .04$ , or shame,  $t(199) = 1.12$ ,  $d = .17$ , expressions, all  $ps > .25$ ; and the pattern of status judgments of each expression within each group was identical across the two groups. That is, both groups explicitly judged the pride expression as less deserving of status than the happy expression,  $t(102) = 10.74$  and  $t(96) = 9.38$ ,  $ds = 1.36$  and  $1.30$ ,  $ps < .001$ , for Fijians and North Americans respectively; more deserving of status than the shame expression,  $t(102) = 4.64$ , and  $t(96) = 10.41$ ,  $ds = .76$  and  $1.49$ ,  $ps < .001$ ; and no more nor less deserving of status than the neutral expression,  $t(102) = 0.89$ ,  $d = .15$ , and  $t(96) = 0.77$ ,  $d = .12$ , both  $ps > .37$  (see Figure 2). All of these effects held when controlling for age and gender.<sup>1</sup> In addition, although positivity and status judgments of each expression were strongly positively correlated,<sup>2</sup> all effects on status judgments held controlling for positivity judgments of all four expressions, suggesting that status ratings were not made on the basis of targets' perceived positivity (see Supplemental Materials for complete analyses on positivity ratings; [www.ubc-emotionlab.ca/cross-culturalstatussignal.pdf](http://www.ubc-emotionlab.ca/cross-culturalstatussignal.pdf)).

As a follow-up, we next re-ran these analyses including only Caucasian North Americans ( $n = 31$ ), to ensure that sample differences could not be attributed to differences in ethnic homogeneity. Doing so, the overall interaction did not reach significance,  $F(3, 130) = 1.66$ ,  $p = .18$ , but all of the within-sample differences between emotion expressions replicated what were found in the full North American sample, all  $ps < .001$ , as did the only specific group difference; Fijians again rated happy displays higher in status than did Caucasian North Americans,  $t(132) = 3.40$ ,  $d = .64$ ,  $p < .01$  (see Figure 3).

Finally, to ensure that North Americans' status judgments were not affected by the (Black) race of the target used in the main study (given the low frequency of individuals of this race within the target population), we examined status judgments of the Caucasian target used in the follow-up study. Using a repeated-measures ANOVA, a very similar pattern of ratings emerged. There was a main effect of emotion expression,  $F(3, 51) = 39.21, p < .001$ , with an identical pattern of means as emerged in the main study: happy was rated highest status,  $M = 0.64$ , significantly higher than pride,  $M = 0.24, t(54) = 2.75, d = .48, p < .01$ ; neutral,  $M = -0.12, t(54) = 5.65, d = 1.07, p < .001$ ; and shame,  $M = -1.02, t(53) = 10.43, d = 2.08, p < .001$ . Shame was rated lowest status, significantly different from pride,  $t(53) = 7.05, d = 1.41, p < .001$ , and neutral,  $t(53) = 8.48, d = 1.21, p < .001$  (see Figure 4). The only difference from the main findings that emerged was that, here, the difference between the pride and neutral expressions reached significance,  $t(54) = 2.26, d = .45, p < .05$ , whereas with the Black target in the main study this difference was not significant, for North Americans or Fijians.<sup>3</sup> This difference between studies should not be taken to mean that North Americans view a Caucasian man showing pride as higher status than a Black man showing pride [ $M_s = 0.24$  vs.  $0.08$ , between studies  $t(150) = 1.25, d = .20, p = .21$ ], nor that they view a Black man showing a neutral expression as higher status than a Caucasian man showing neutral [ $M_s = 0.00$  vs.  $-0.12$ , between-studies  $t(150) = 1.07, d = .18, p = .28$ ], given that neither between-groups difference was significant. Furthermore, with only one target of each skin-tone grouping, it would be premature to draw any race-based conclusions from these data. However, these results do allow us to conclude that, in general, the findings of Study 1, and, in particular, the differences in perceived status of happy vs. pride displays, and of pride vs. shame displays, cannot be attributed to the use of a Black target.

At first glance, the findings of Study 1 seem inconsistent with our hypothesis that pride displays signal high status, given that neither Fijians nor North Americans explicitly judged a pride-displaying target to be more deserving of high-status than a happy-displaying target or, in the main study, a neutral-displaying target. However, these explicit judgments are consistent with our predictions regarding both Fijian social norms about displaying any kind of overt status signal, and North American social norms about the appropriateness of displaying pride in situations where it is not warranted. Participants were not given any contextualizing information indicating the appropriateness of these displays (e.g., whether the target had recently experienced a success, or was in fact a high-status group member), so Americans' judgments were likely influenced by an awareness of cultural rules about the displays' cross-situational appropriateness. Given that a desire to conform to such norms (i.e., a self-presentation bias) would influence explicit judgments more than implicit (Banse, Seise, & Zerbes, 2001), we next turned to the IAT. In the IAT, participants are instructed to respond as quickly as possible to all stimuli, such that any differences between mean RTs to particular pairings of stimuli are assumed to be unintentional and beyond participants' control. Thus, in contrast to explicit responses, IAT responses occur largely without awareness or reflection on social norms, and thus tend to reflect less socially inhibited or self-controlled cognitive processing (Banse et al., 2001; Lane et al., 2007; Monteith et al., 2002). For this reason, we predicted that IAT results would reveal an implicit association between pride displays and high status in both cultural groups, despite the absence of such an association in explicit responses.

## Study 2

In Study 2, we conducted a series of four IAT-based experiments, comparing the strength of participants' implicit status associations with pride displays to the strength of their implicit

status associations with shame, neutral, and happy displays. Specifically, Studies 2A, 2C, and 2D used the IAT to compare Fijians' RTs and errors when pride expressions were paired with high-status words and other expressions with low-status words, versus when pride was paired with low-status and other expressions with high-status. Study 2B replicated Study 2A in a sample of North Americans.

## *Method*

### *Studies 2A, 2C, and 2D*

*Participants and procedure.* Study 2 was comprised of three IAT-based experiments.<sup>4</sup> Specifically, 34 Fijians (58% female; aged 19-55, *median* = 27; 8-13 years of education, *median* = 12) participated in Study 2A, 28 Fijians (31% female, aged 34-68, *median* = 52; 3-12 years of education, *median* = 8) participated in Study 2C, and 57 Fijians (65% female, aged 17-60, *median* = 40; 0-16 years of education, *median* = 8) participated in Study 2D. The IAT typically requires participants to respond as quickly as possible to various on-screen stimuli by pressing certain computer keys. However, to adapt the IAT for use in a small-scale society with limited literacy and no computer familiarity, we modified the procedure, such that participants responded using large (3"x 3") blue and black buttons connected to a laptop computer, rather than using computer keys (see Baron & Banaji, 2006); and instructions were presented both visually on-screen and orally by a fluent Fijian experimenter. As in Study 1, Fijians administered these experiments, thereby minimizing any potential impression management vis-a-vis the presence of Westerners.

Participants sat on the floor of a Fijian traditional house (*bure*) with a 15"-monitor battery-powered laptop computer placed on the floor in front of them. They viewed onscreen two photos of an actor displaying pride, then, depending on study assignment, two photos of the same actor displaying some other emotion; specifically, participants assigned to Study 2A viewed two shame displays, participants assigned to Study 2C viewed two neutral displays, and participants assigned to Study 2D viewed two happy displays. In all studies, pride expressions were labeled Position B (*Tuvaki B*), and other expressions "Position A" (*Tuvaki A*); pride displays were assigned the "B" category to ensure that associations between pride and high-status were not

confounded by any implied positivity or high status of the A label. Participants were given no indication that “Positions” conveyed emotions, to ensure that any associations that emerged could not be attributed to an association between the *concept* of pride and status, rather than an association between the nonverbal display of pride and status.

A Fijian experimenter read instructions aloud in Fijian, then participants categorized photos into the appropriate position [A or B], and a series of words into high or low-status categories, by pressing one of two buttons; accuracy rates were 89% (photos) and 84% (words). In these training rounds, pride and low-status shared a button, to avoid inadvertently teaching participants to associate pride with high-status (any inadvertently formed associations between pride and low status would work against our hypothesis.) Participants next completed an IAT where, in one block, pride photos and high-status words shared a button, and other-expression photos and low-status words shared a button. In the comparison block, these pairings were reversed. After one round of the IAT, participants completed a second round with a different-race actor portraying all expressions. Block order and round order were counterbalanced; no order effects emerged, so results were collapsed across blocks and rounds. Participants were instructed to categorize all stimuli as quickly as possible, such that quicker responses would represent unintended associations that could not be controlled.

In each study, we predicted that participants would show stronger implicit associations between pride displays and high-status concepts, and other displays (i.e., shame, neutral, happy) and low-status concepts, compared to the reverse pairs of associations. These predictions were derived from our overarching hypothesis that, if pride displays evolved to signal high status, then individuals across all cultures should hold implicit mental associations between these displays



and high-status concepts, despite a tendency to explicitly discount any high-status associations of pride in at least some cultures.

*Materials.* Photos were taken from the UCDSEE (Tracy et al., 2009). All four reliably recognized versions of both pride and shame expressions were included (see Figure 1). No significant differences emerged between versions of pride or shame in any study, so results are presented collapsing across the two versions. All photos featured a male target of either European or African descent (see Figure 1); no target effects emerged, so results are presented collapsing across both targets.

High- and low-status words were based on those used and validated previously with North Americans (Shariff & Tracy, 2009), with changes made to better reflect high and low status concepts in Fijian. These were (followed by Fijian translations): commanding (*veivakaroti*), dominant (*veiliutaki*), and admired (*qoroi*), versus low (*lolovira*), minor (*lailai*), and substandard (*sakasaka*). These words, and all instructions, were translated into Fijian then back-translated into English. The Fijian translation for “minor,” *lailai*, is also commonly used to denote “small,” so, to ensure that slower RTs between pride displays and low-status words were not driven by this alternate meaning of *lailai* and its clear contrast to the largeness of the pride display, we re-calculated results in all three Fijian IAT experiments (Studies 2A, 2C, and 2D) after removing *lailai*; all findings held.<sup>5</sup>

### *Study 2B*

Fourteen UBC undergraduates (71% female) followed the same procedures as participants in Study 2A (i.e., they were seated on the floor and responded by pressing external buttons connected to a laptop computer, rather than a keyboard, while an experimenter of the same nationality and ethnicity was present) to complete an IAT comparing the status associations

of pride and shame expressions, in English. Although previous research has demonstrated that, among North Americans, pride displays are substantially more strongly implicitly associated with high status than shame displays (Shariff & Tracy, 2009), Study 2B was conducted to test whether this result would hold using the modified IAT procedures used in Study 2A with Fijian participants. Furthermore, by conducting an experiment in which North Americans completed identical procedures to Fijians, we could directly compare North American and Fijian results, to test for cultural differences in implicit status associations with pride displays. We did not expect to find cultural differences in these associations; however, we did expect Fijians to show somewhat slower reaction times and higher error rates, overall, than North Americans, because of their relative lack of computer experience and formal education. To equate the two samples (i.e., from Study 2A and Study 2B) on ethnic homogeneity, in Study 2B we included only Caucasian individuals who were born and currently living in North America. Accuracy rates for single categorization tasks were 98% (words) and 95% (photos).

### *Results and Discussion*

Study 2A compared Fijians' responses when viewing pride expressions paired with high-status words and shame expressions paired with low-status words (i.e., presumed congruent pairings), to responses when pride was paired with low-status and shame with high-status (i.e., presumed incongruent pairings). For each participant, after excluding responses that exceeded 10s, we used the recommended algorithm to compute a *D-measure*, which indicates the difference between the participant's mean error-corrected RTs for the two pairings of interest (here, shame/high-status and pride/low-status pairings were compared to shame/low-status and pride/high-status pairings) divided by the standard deviation for the two pairings. The *D-measure* takes into account both RTs and errors by adding a 15ms time penalty to the mean trial time for

each incorrect response, rather than simply excluding trials where expressions or words were incorrectly categorized (see Greenwald, Nosek, & Banaji, 2003). For example, if a participant averaged 700ms on a particular block, and made 3 mistakes, the error-corrected average trial time would be  $700 \text{ ms} + (3 \times 15 \text{ ms}) = 745 \text{ ms}$ . This is equivalent to adding 600 ms per error to the sum total of the 40 trials prior to averaging, as was recommended by Greenwald and colleagues (2003) for IAT designs where participants can proceed to the next stimulus following incorrect responses. Because the IAT creates a speed/accuracy tradeoff—wherein participants can purposefully decrease RTs at the expense of making more errors, or decrease errors at the expense of increasing RTs—it is necessary to include both RTs and errors in the computation of the D-measure. The D-measure algorithm was developed by examining the psychometric properties of a large number of candidate scoring methods (which differed in the relative weights given to RTs and errors) in several large data sets, and was found to have strong internal consistency and external validity, while minimizing several potential concerns with IAT analytic methods, such as the effect of the order of IAT blocks, and of having previously completed one or more IATs. These comparisons also demonstrated that the D-measure performed better (on several criteria) than two transformations typically used to deal with the expected positive skew of RT distributions—taking the log and the reciprocal (Greenwald et al., 2003; Lane et al., 2007).

After computing D-measures for each participant, we used a one-sample *t*-test to determine whether the overall sample D-measure differed significantly from 0, which would indicate a difference in implicit associations between the two sets of pairings (with a positive D-measure indicating a stronger association between pride and high status, and shame and low-status, than the reverse pairings). Results demonstrated a significant difference, such that

responses were substantially faster when pride was paired with high-status and shame with low-status than the reverse,  $D\text{-measure} = 0.41$ ,  $t(29) = 7.30$ ,  $p < .05$ , Cohen's  $d = 2.71$  (see Figure 5). This replicates previous findings among North Americans (Shariff & Tracy, 2009), but because those findings were not based on the modified IAT procedures used here, which likely have the effect of decreasing both RTs and errors, we could not directly compare results between samples. Thus, Study 2B replicated this study using the modified IAT procedures in a new North American sample.

*Study 2B.* As was the case with Fijians in Study 2A, North Americans showed substantially faster error-corrected RTs for pride-high status/shame-low status pairings than the reverse,  $D\text{-measure} = 0.53$ ,  $t(12) = 4.72$ ,  $p < .05$ ,  $d = 2.72$  (an effect size almost identical to that found in Study 2A). To test whether pride displays are a stronger signal of high status in North American compared to Fijian culture, we next directly compared the magnitude of  $D\text{-measures}$  between Studies 2A and 2B. If there are cultural differences in the status implications of pride displays, such that pride is a weaker status signal among Fijians, then we would expect the  $D\text{-measure}$  to be smaller among Fijians compared to North Americans. However, this comparison demonstrated no significant difference between the Fijian and North American  $D\text{-measures}$ ,  $t(43) = 0.81$ ,  $d = .25$ ,  $p = .42$ , suggesting that pride displays are equally strongly associated with high status (compared to shame displays) in both cultures. Uncorrected RTs across the two populations were also highly similar; overall means did not differ significantly,  $t(43) = 1.54$ ,  $d = .47$ ,  $p = .13$ , though RTs for congruent pairings were marginally faster among North Americans,  $t(43) = 1.83$ ,  $d = .56$ ,  $p = .07$  [for incongruent pairings, the difference was  $t(43) = .89$ ,  $d = .27$ ,  $p = .38$ ]. North Americans did show lower error rates [7% vs. 23%;  $t(43) = 5.59$ ,  $d = 1.70$ ,  $p < .05$ ],<sup>6</sup> particularly on incongruent trials, which require participants to inhibit intuitive

associations and rapidly respond in counterintuitive ways, 8% vs. 33%,  $t(43) = 5.80$ ,  $d = 1.77$ ,  $p < .05$ . This suggests that Fijians had greater difficulty than North Americans inhibiting responses aligned with their automatic associations.

Given group differences in gender, education, age, and, perhaps most important, computer and videogame experience, these small performance differences between groups are not surprising. To examine whether these group differences are likely to be accounted for by demographic factors, we estimated regression coefficients, using ordinary least squares, within the Fijian data (we could not include data from both samples in the regressions simultaneously because of a lack of substantial variance, in the UBC sample, on several of the critical demographic variables of interest, most notably education). Separate regression equations were estimated to predict RTs and error rates in congruent and incongruent trials. Age, education, and gender (with as female coded as 0, male as 1) were entered as simultaneous predictors. Table 1 presents the standardized and unstandardized coefficients for each predictor. As can be seen from the table, gender had a significant effect on mean RTs and errors for both congruent and incongruent trials, with women making relatively more errors and responding relatively more slowly than men. There was also a significant effect of education on mean RTs in incongruent trials (and a marginal effect in congruent trials), suggesting that participants who had more years of formal schooling responded somewhat more quickly.

To determine whether gender, age, and education differences between samples might account for the differences in RTs and error rates that emerged between the Fijians and North Americans, we next entered the North American sample mean values for gender (.29), education (17.32 years, the mean number of years of education reported by North American participants), and age (23 years, the mean and median age of North American participants). Using

unstandardized beta weights from the Fijian sample regressions, the predicted values for the North American sample were:  $RT_{con} = 523.98$ ,  $RT_{incon} = 639.93$ ,  $number\ of\ errors_{con} = 6.62$ , and  $errors_{incon} = 3.90$ . These predicted RTs fell outside the 95% confidence intervals of the actual mean RTs that emerged in the North American sample,  $Ms = 643.93$  and  $796.80$ ,  $SEs = 27.09$  and  $46.22$ , for congruent and incongruent trials, respectively; however, actual means were slightly higher than predicted means (i.e., North Americans did not respond as quickly as they were expected to based on the regressions), suggesting that the sample demographics used as predictors in the regressions (i.e., education, gender, age) more than accounted for the (non-significant) RT differences between samples. Both predicted error means were also outside the 95% confidence interval of the actual means,  $Ms = 2.32$  and  $2.93$ ,  $SEs = 0.55$  and  $0.64$ , consistent with the finding of significant between-group differences in errors. However, the predicted error means were closer to the actual means than were the Fijian actual means,  $Ms = 10.50$  and  $8.40$ ,  $SEs = 1.30$  and  $1.29$ , suggesting that sample differences in demographics contributed to the difference between groups. In particular, our measure of years of education may indicate the development of cognitive skills relevant to IAT errors, such as reading comprehension. Gender likely played role because of major gender differences in Fijian culture in the importance of status in daily life. Fijian men must constantly track their own status relative to those around them, whereas for women this is less essential. For example, each time men sit at a meal or socialize, they sit by rank, whereas women always sit at the low-status end, and are considerably more flexible about status distinctions within their gender group (in fact, women often cram together so high-status men can spread out). As a result, Fijian men must be highly attuned to status differences, and for this reason may have responded more quickly and accurately to the status-relevant words and images in the IAT. Nonetheless, it appears that other

factors we could not measure, such as expertise or experience with computers/videogames (which did not vary from 0 in the Fijian sample), were also likely to be relevant to the group difference in error rates.

Thus, while few group differences emerged in IAT performance, those that did can largely be attributed to differences in sample demographics. Furthermore, it is important to note that despite these performance differences, a large implicit effect of equal magnitude emerged in both groups, suggesting a strong, cross-cultural implicit association between the pride expression and high status. We can thus conclude that, in both groups, pride is more indicative of high status than shame at both an implicit and explicit level.

To examine whether pride might be a stronger implicit than explicit status signal, and to address the likely possibility that pride-shame comparisons were partly driven by shame's low-status associations, we next conducted Study 2C, an IAT among Fijians in which the same status words were paired with either pride or neutral displays. Neutral expressions are not theoretically associated with status, so if the pride-high status association holds in this comparison, it cannot be attributed to any low-status associations of neutral. We predicted that a significant implicit association would again emerge between pride displays and high status, suggesting that Fijians' implicit associations between these displays and high status, found in Study 2A, is due to signaling properties of the pride expression, rather than to the low-status associations of shame.

*Study 2C.* As shown in Figure 5, Study 2C replicated Study 2A; even when comparing pride with neutral displays, mean error-corrected RTs were faster when pride was paired with high-status and neutral with low-status, than the reverse pairings,  $D\text{-measure} = .35$ ,  $t(27) = 2.28$ ,  $d = .68$ ,  $p < .05$ . This result replicates similar findings among North Americans (Shariff & Tracy, 2009). Thus, although Fijian villagers and educated North Americans tend to *explicitly* judge

pride displays as no more worthy of status than those displaying neutral expressions, at an *implicit* level pride displays are more strongly associated with high status than are neutral displays, in both cultures.

However, it remains possible that, among Fijians, this association is due to something shared by pride and high-status, such as positivity, rather than to a functional message conveyed by pride. In previous North American research, this potential confound was eliminated via the demonstration that pride displays are more strongly implicitly associated with high-status than are happy displays, even though happy displays are more unambiguously positive than pride (and were explicitly judged as higher in positivity than pride displays by both Fijians and North Americans in Study 1; see Supplemental Materials, [www.ubc-emotionlab.ca/cross-culturalstatussignal.pdf](http://www.ubc-emotionlab.ca/cross-culturalstatussignal.pdf)). If pride's implicit association with high-status were due to shared variance in positivity, an IAT comparison between pride and happiness should yield a stronger implicit status association for happy displays. However, if pride is uniquely associated with high-status, then the comparison with happy displays should yield a stronger status association for pride displays. There is also a third possibility; given that high-status Fijians tend to display happiness (rather than pride) on a regular basis, and the finding from Study 1 that Fijians hold particularly strong explicit high-status associations with happy displays, Fijians might implicitly associate happy displays with high status even if there is an evolved cognitive association between pride displays and high status. If this is the case, we would expect to find no significant implicit status association when comparing these displays to each other. Study 2D tested these three competing hypotheses, and did so with a larger sample than the previous IAT studies, in order to provide greater power to detect a smaller effect. Based on a power analysis, the  $N$  of 57



provided 76% power to detect an effect of  $D\text{-measure} = .30$ , weaker than the weakest IAT effect reported thus far (from Study 2C, comparing pride with neutral displays).

*Study 2D.* The mean  $D\text{-measure}$  that emerged,  $-0.15$ , did not differ significantly from 0,  $t(56) = 1.24$ ,  $d = .16$ ,  $p = .22$ . To verify that this null effect was not entirely a result of the larger variance in this study compared to Studies 2A, 2B, and 2C (see Figure 5), we next winsorized the  $D\text{-measure}$  variable by converting scores in the bottom 5<sup>th</sup> and top 95<sup>th</sup> percentiles to the equivalent of the 5<sup>th</sup> and 95<sup>th</sup> percentile scores. A one-sample  $t$ -test on the resulting  $D\text{-measure}$  ( $-.16$ ) again revealed no significant difference from 0,  $t(56) = 1.37$ ,  $d = .18$ ,  $p = .18$ . This suggests that neither pride nor happy displays are more strongly implicitly associated with high-status than the other, and, in contrast to both the positivity-confound prediction and participants' explicit judgments, Fijians do not hold stronger implicit associations between high status and happy displays than between high status and pride displays. However, in contrast to previous North American evidence that pride is more strongly implicitly associated with high status than happiness (Shariff & Tracy, 2009), Fijians responded to the two displays with apparently equally strong status associations.

Given the substantial difference between Fijians' explicit and implicit status associations with happy and pride displays (based on the present results and those of Study 1), we next conducted subsidiary analyses to examine whether those Fijians who hold stronger implicit status associations with pride displays than happy displays hold similar associations at the explicit level, or in fact hold opposing implicit and explicit status associations with pride compared to happy displays. All of the Fijian participants in Study 2D were also in Study 1, so we were able to directly probe this issue. Twenty-five participants in Study 2D (44% of the sample) showed a stronger implicit association between pride displays and high status than between happy displays

and high status. Yet, in Study 1 this subsample still demonstrated a stronger *explicit* association between high-status and happy displays than pride,  $M_s = 1.70$  vs.  $0.77$ ,  $t(19) = 2.55$ ,  $d = 1.17$ ,  $p < .05$ . Thus, this group of 25 Fijians had directly contrasting implicit and explicit associations between pride and status compared to happy and status. Another way to understand this implicit/explicit dissociation is by comparing the proportion of Fijians in Study 1 who explicitly judged pride displays to be higher status than happy displays—only 4% of the sample—to the proportion of Fijians in Study 2D who implicitly judged pride displays as higher status than happy displays—44%. This large and significant difference between studies suggests that there is a substantial group of Fijians who, like North Americans, have dramatically dissociated implicit and explicit status associations, such that pride is the stronger status signal at an implicit level, but happy the stronger status signal at an explicit level. Thus, while happy displays seem to communicate high status at both an implicit and explicit level in Fiji, the clear difference that emerged between the IAT results and explicit judgments is most consistent with the conclusion that the pride display is an explicitly suppressed, implicit signal of high status among these individuals.

Furthermore, although the null effect that emerged in Study 2D, comparing pride and happy displays, could indicate confusions between the two expressions, this is unlikely. In Study 1, Fijians made a considerably larger explicit status distinction between pride and happy displays ( $d = 1.25$ ) than between pride and neutral ( $d = 0.15$ ), suggesting a high level of discrimination between the former pair of displays. Nonetheless, to further address this issue, we conducted an emotion-recognition study among the Fijians, to test whether they can accurately identify the pride display. Although previous research suggests that pride recognition is likely to be universal, only a few cultural groups have been directly examined (educated North Americans

and Italians, and non-literate Burkinabes living in a traditional small-scale society; Tracy & Robins, 2008a), so it remains possible that Fijians do not share this ability, and that pride recognition is not in fact a human universal. Study 3 addressed this question by testing whether Fijians could reliably recognize pride expressions. Given previous findings of cross-cultural recognition, we predicted that Fijians would recognize pride displays at rates significantly greater than chance.

### Study 3

#### *Method*

*Participants and procedure.* A subsample of Fijian participants included in Studies 1 and 2 ( $N = 20$ , 60% female; age range = 19-60, *median* = 38; education range = 7-11 years, *median* = 9) viewed photos of the same two targets as were used in Study 2, posing expressions of anger, happiness, neutral, pride, and shame (anger was not included in Study 2, but was included here as an additional comparison). All photos were taken from the UCDSEE. For each photo, participants were asked, “Which of the following labels best describe what this person is expressing?” They then were asked to choose from the following response options: anger (*borisi*), arrogant (or, overly admiring oneself, *vakadokadokai koya*), confident (*lomadei*), disgust (*vakasisila*), fear (*mataku*), happiness (*marau*), pride (or, admiring oneself, *qoroi koya vaka koya*), sadness (*rarawa*), shame (*madua*), other (*ke tlia lequa nai vukivuki*), and nothing is expressed (*tabu tlia nai vukivuki e vakaraitakinia*; see Supplemental Material for details on how these translations were derived; [www.ubc-emotionlab.ca/cross-culturalstatussignal.pdf](http://www.ubc-emotionlab.ca/cross-culturalstatussignal.pdf)). The “other” option was included to address limitations associated with the use of a forced-choice response method in emotion recognition studies (Frank & Stennet, 2001; Russell, 1994). All instructions and response options were read aloud to participants in Fijian by a Fijian

experimenter, and participants responded by saying aloud the option they viewed as most accurate, and pointing to the option on an answer sheet (options were presented in random order on an A4 sheet).

### *Results*

Based on the binomial test, the pride recognition rate that emerged, 56%, was significantly greater than chance (with chance set at 14% based on the number of emotion response-options provided—7—thus stringently not counting the “other” and “no emotion” options, and treating the three pride options—“arrogant”, “confident”, and “pride”—as a single option),  $p < .05$ . This rate is almost identical to that found previously in a similar small-scale society sample (i.e., 57% in Burkina Faso; Tracy & Robins, 2008a), and similar to the rates found here for anger (38%) and shame (52%), both of which were also, on average, recognized significantly better than chance,  $ps < .05$  (see Table 2). Happy displays were recognized at a very high level of accuracy (90% on average), consistent with meta-analytic evidence that happiness tends to be the best recognized facial expression of emotion across cultures (see Elfenbein & Ambady, 2002). In contrast, neutral displays were correctly identified as “no emotion” only rarely (3%), likely due to an assumption among Fijian participants that researchers would not ask them to identify an expression that does not, in fact, convey anything. Importantly, participants did not tend to identify neutral displays as shame; if such a confusion occurred frequently, it could account for the implicit effect found in Study 2C (i.e., that difference might be attributed to an implicit status distinction between pride and shame, rather than pride and neutral). In fact, only 13% of participants identified neutral displays as shame, and the highest incorrect label applied to these displays was pride (25%). If participants in Study 2C mistook neutral displays

for pride, this would work against the effects predicted (and found) in that study, and would thus suggest that the true effect size of the implicit pride-neutral difference is larger than that found.

In general, the recognition rates found here are comparable to those typically found for the basic-emotion expressions in small-scale society samples when multiple-option, forced-choice response methods are used; for example, recognition rates in one of the first non-Western groups tested, the *Fore* of Papua New Guinea, were 82% for happy, 54% for fear, 44% for disgust, and 50% for anger (Ekman et al., 1969). Of note, those researchers did not provide the option for participants to say “no emotion” or “other”; the absence of these options likely inflated those prior results (Russell, 1994). Thus, although the recognition rates found here may seem lower than rates typically found in highly educated Western samples, they are in fact completely consistent with all previous studies that have assessed recognition of facial expressions of emotion in non-Western, traditional small-scale societies (i.e., Boucher & Carlson, 1980; Ekman et al., 1969; Ekman, 1972), and with most cross-cultural studies conducted in educated samples from non-Western industrialized societies, as well. Based on Elfenbein and Ambady’s (2002) meta-analysis, mean rates (across emotion expressions) range from 27% to 91%, and the overall mean across the 51 studies they examined (all of which included at least one North American sample, which almost always raised the study’s mean) was 66%, not considerably higher than the rate found here for pride. There are numerous reasons for the well-replicated finding of lower recognition rates in non-Western compared to Western samples, as well as for a similar difference between highly educated samples from industrialized populations compared to non-literate individuals living in small-scale traditional societies, including cultural dialects and display rules that may lead to more and less subtle differences in the way emotions are displayed across cultures, as well as increased error rates resulting from

translation problems, difficulties associated with maintaining tight experimental control in a field setting, and asking participants who hold strikingly different cultural values and are unfamiliar with research practices to examine images of strangers and identify their emotions (see Elfenbein & Ambady, 2002; Elfenbein & Ambady, 2003; Marsh, Elfenbein, & Ambady, 2003; Matsumoto, 1990; 2002). Taking these issues into account, the recognition rates found here suggest that Fijians, in general, showed a high level of accuracy. Using unbiased hit rates, which take into account both error and base rates (Wagner, 1983), we found a similar pattern (62% for happiness, 49% for shame, 36% for pride, and 33% for anger; all significantly greater than chance based on the binomial test,  $p < .05$ ). There were no significant target effects on recognition of any expression.

On average, while 40% of participants mislabeled pride displays as happiness, only 7% mislabeled happy displays as pride. Thus, the majority of participants correctly discriminated between the two expressions, making it unlikely that confusions between pride and happiness account for the absence of a difference in the two expressions' associations with high-status. Participants made almost no other errors in labeling pride displays; the expression was identified as fear by 3% of participants and anger by 1%. The label "pride" was occasionally mistakenly applied to other expressions; it accounted for 25% of responses to neutral displays (as mentioned above), 20% of responses to anger displays, 7% of responses to happy displays, and 5% to shame; thus, pride's overall "false alarm" rate was 14%.

### General Discussion

The present research (a) provides cross-cultural evidence supporting the hypothesis that the nonverbal pride expression is an adaptation for implicitly communicating high-status, and (b) demonstrates successful implementation of the IAT in a traditional small-scale society. In the

process, we also confirmed that (c) the pattern of explicit status judgments of happy, pride, neutral, and shame expressions is highly similar across North America and Fiji, and (d) North American displays of happiness, pride, shame, and anger are recognized above chance in Fiji. These studies take an important step in emotion research, by examining not only whether expressions are robustly identified with particular emotion labels across diverse societies, but also whether a robustly identified emotion expression serves a broader communicative function across cultures. Furthermore, this research is the first to use cross-cultural methods to test a hypothesis about the evolved function of a universally recognized emotion expression.

More specifically, we found that the pride expression is implicitly associated with high status among both highly educated North American university students and Fijians living in a traditional small-scale society with a set of cultural practices and rituals that suppress personal status displays by individuals of both high and low ascribed statuses. Based on the present findings and prior research (Shariff & Tracy, 2009), in both populations pride displays are more strongly implicitly associated with high status than are shame and neutral displays, and equally or more strongly than happy displays. Yet, the present results also revealed a cultural difference which is consistent with ethnographic expectations: Fijians explicitly judged happy displays as conveying higher status than did North Americans and this difference was reflected in implicit responses, demonstrated by a null effect in the Fijian IAT comparing the status associations of pride and happiness displays. These findings are consistent with ethnographic observations of how Fijian social norms regulate the emotional displays of high-status individuals. While exaggerated or unmerited pride displays may lead to relatively low explicit status judgments in both Fiji and North America—as is indicated by the results of Study 1—it is particularly important that high-status Fijians inhibit the open expression of pride, and convey their status via

positive affect instead. Given this cultural difference, we expected Fijians to show lower *explicit* status judgments of pride than North Americans. Instead, the two groups' explicit status judgments differed only for happiness. This finding suggests that the between-groups difference in IAT results is likely due to a cultural difference in the importance and frequency of high-status individuals displaying *happiness*. Given the dissociation between explicit and implicit judgments that emerged in *both* groups—explicitly, happy displays were judged higher status than pride, but implicitly, pride displays were equal or higher status than happy—automatic and deliberative judgments appear to differ in the same manner across cultures, but Fijians view happy displays as stronger status indicators than do North Americans, at both cognitive processing levels. In other words, because Fijians *explicitly* view happy displays as substantially higher status than pride, the nullification of this difference at the *implicit* level is highly notable.

If our interpretation is correct, these results indicate that both happiness and pride implicitly convey status in Fiji, and thus speak to the cross-cultural and perhaps universal power of pride's implicit high-status message. However, it remains possible that the absence of a difference between pride and happy displays' implicit association with status indicates that Fijians do not distinguish between positive emotions in making implicit status associations; any positive emotion may be implicitly perceived as indicative of high status (even though this is not the case for explicit judgments). In our view, the totality of evidence best supports the former interpretation—that both pride and happiness implicitly signal high status in Fijian culture, for different reasons—but future research is needed to address this issue.

### *Implications*

One implication of the finding that happy expressions are explicitly judged higher status than pride in both cultural groups is that there may be a widespread social norm, or other



behavioral incentive, for inhibiting pride displays from those seeking to garner status benefits. While such individuals may successfully send an implicitly perceived message, observers may seek contextual cues of status increases (e.g., observed success) or friendliness and a lack of arrogance (i.e., happy displays) before explicitly granting higher status. In humans' evolutionary history, once pride became a reliably recognized implicit signal of status, a wide range of hierarchically structured cultural groups may have developed social-control mechanisms to exact a cost on displaying pride when it is not genuine. By invoking social norms that punish individuals who appear overly arrogant by virtue of displaying pride, these cultures may effectively reduce rivalries and status conflicts that would occur frequently if individuals felt unconstrained from displaying an expression that communicated their belief in their deservedness of status, regardless of whether a status gain was in fact deserved. The results of Study 1 suggest that both Fijians and North Americans have developed such regulatory norms, though they appear to work in somewhat different ways; in Fiji, it is considerably more important than in North America that high-status individuals not only avoid showing a great deal of overt pride, but also that they *do* show happiness. In other societies, such as "Big Man" societies where status and political power are acquired through highly visible accomplishments and self-aggrandizing (Sahlins, 1963), overt pride displays may be less socially problematic, and might even be judged as high status at an explicit, as well as implicit, level. Future research is needed to address this complex issue, but the present findings provide compelling evidence for distinct cognitive mechanisms underlying the implicit versus explicit perception and interpretation of pride expressions.

A broader implication of the present results pertains to our understanding of status-signaling dynamics. Individual differences in status ranking are ubiquitous across human and

many primate societies, with the attainment of high status providing evident fitness benefits (Ellis, 1995; Fried, 1967; von Reudan, 2011). The present research suggests both a potentially evolved mechanism for automatic, non-verbal communication that facilitates status negotiations, and the presence of display norms, which operate to differing degrees in each population, that influence the extent to which such displays result in explicit—and to a lesser degree implicit—status inferences.

These results, particularly when viewed in light of prior work, thus have several noteworthy implications. First, they demonstrate that the pride expression cross-culturally influences perceptions of those who show it, and, in all likelihood, behaviors exhibited toward proud targets. Implicit associations tend to predict certain interpersonal behaviors more powerfully than corresponding explicit associations, particularly behaviors involving socially sensitive topics (Greenwald, Poehlman, Uhlmann, & Banaji, 2009). Thus, culturally inappropriate status associations, such as that between pride and high-status in Fiji, may emerge more clearly in implicit responses than explicit. Indeed, given ethnographic observations suggesting that Fijian social norms prohibit any kind of status-enhancing displays from being shown by high-status individuals, the cross-cultural dissociation between pride's implicit and explicit status associations can be inferred to indicate that either: (a) despite limited exposure, Fijians have learned and encoded a European implicit association between pride and high-status, while simultaneously retaining their own explicit social norms of suppressing overt status displays, or (b) the pride-status signal is part of an evolved cognitive architecture. While it is not impossible that implicit associations culturally diffused through the community via sporadic interactions with Westerners, while explicit cultural rules remained fixed, it is difficult to imagine how this could happen given what is known about cultural transmission. If anything, the

reverse process—of explicit rules being diffused-- seems more probable. In light of prior evidence for the pride display's universality and early-life emergence (Belsky & Domitrovich, 1997; Lewis et al., 1992; Stipek et al., 1992; Tracy et al., 2005; Tracy & Matsumoto, 2008; Tracy & Robins, 2008a), the present findings converge well with (b), the notion that pride displays are a communicative component in our evolved status psychology.

This highlights an additional implication of these results, which is relevant to several domains of psychological science: the importance of combining implicit and explicit approaches in cross-cultural research (also see Yamaguchi et al., 2007). The assessment of cognitive associations at both levels of processing allows for a more fine-grained understanding of both cultural differences and evolved mechanisms. Had we measured explicit judgments alone, we would not have uncovered the strong cross-cultural implicit association that emerged between pride displays and high-status. Had we measured implicit associations alone, we would not have found the cross-cultural dissociation between implicit and explicit status associations of pride displays, or that both groups explicitly judge happy displays as higher status than pride.

Indeed, a third implication of this research is that RT-reliant methods such as the IAT can be used in small-scale societies with limited formal education or exposure to the larger world—populations that represent a considerably broader slice of humanity than is available in industrialized societies. The present work marks the first attempt to use the IAT in this kind of sample, and demonstrates its utility; Fijian RTs and D-measures did not differ significantly from those of typical Western research samples. Indeed, the IAT may *more* sensitively reveal the implicit cognitive tendencies of individuals in such populations, given that Fijians were less able than North Americans to inhibit automatic associations, as was evidenced by their relatively higher error rates, particularly on incongruent trials.

*Limitations*

Several researchers have noted limitations to IAT studies (e.g., Arkes & Tetlock, 2004; Payne, 2005); however, most of these do not apply to the present research because they concern the measurement of individual (rather than group) differences, and pertain largely to studies assessing undesirable biases (e.g., racism). Furthermore, the IAT's central limitation, its necessarily relative nature (i.e., the implicit status associations of pride can be examined only in comparison to other expressions), was largely circumvented by our multi-step approach, wherein pride was subsequently compared with several different expressions. Nonetheless, future studies should replicate these findings using a non-relative method of implicit responding. Indeed, in our previous research addressing these issues in North American samples, IAT findings were replicated using the Affective Misattribution Procedure (Payne, Cheng, Govorun, & Stewart, 2005), a method of assessing implicit attitudes that does not depend on comparing stimuli of interest with some contrast stimulus (Shariff & Tracy, 2009).

Another caveat is that we cannot know, from these results, whether the implicit high-status message sent by pride is in fact attributed to the sender, or whether any interpersonal judgment has been made. We also cannot be certain that the IAT assessed the same kind of status judgment as our explicit status measure. More broadly, future studies are needed to examine how the present explicit and implicit associations and judgments affect actual interpersonal behaviors such as deference and resource allocation. Based on recent research among North Americans, it appears that pride displays do influence explicit status-based judgments, and the impact of these expressions on such judgments tends to go unnoticed by those making the judgments (Shariff et al., in press). One important future direction is to conduct similar studies across cultures.

Several other methodological issues should be addressed in future work. All photos featured Caucasian or dark-skinned (Black Canadian or African) males. This variation allowed us to assess whether relative physical similarity affected results (it did not), but findings should be replicated using additional, and female, expressers. Similarly, to maximize internal validity we relied on static, decontextualized images. Future research should examine associations in more externally valid conditions, such as when contextual information is available. Again, this is a direction that has recently been taken in North American work (Shariff et al., in press), but needs to be replicated across cultures.

In conclusion, while IAT studies have dramatically increased our understanding of numerous psychological processes, the uniqueness of almost all samples used in these prior studies prevents us from determining whether these previous effects are likely to be adaptations of the human mind, or culturally learned associations. Conversely, anthropologists have long noted the influence of self-presentation biases on explicit assessment methods (Bernard, 2002), highlighting the need for a cross-cultural research tool more resistant to impression management. While the IAT may tap into social norms, participants have less control over RTs and errors when forced to respond quickly than they do over explicit, often deliberated, verbal responses, making IAT responses more revelatory of unintentional associations. Thus, by merging anthropological ethnography with psychological implicit assessment methods, the present work augments the available toolbox for future cross-cultural research.

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Table 1. *Estimated Coefficients from Regressions Predicting Mean Reaction Times (RTs) and Errors for Congruent and Incongruent Trials among Fijians, Study 2A.*

Dependent Variable and Predictors	Unstandardized $b$	Standard Error $b$	Standardized $\beta$	$t$ -value
Mean RT-congruent trials				
Constant	1600.46	516.51	---	3.10*
Gender	-298.58	114.54	-.45	-2.61*
Age	3.68	7.10	.10	0.52
Education	-62.04	33.44	-.34	-1.86 <sup>†</sup>
Mean RT-incongruent trials				
Constant	2471.60	583.49		4.24*
Gender	-410.24	129.39	-.54	-3.17*
Age	-7.00	8.02	-.17	-0.87
Education	-89.59	37.78	-.43	-2.37*
Mean Errors-congruent trials				
Constant	26.43	10.59		2.50*
Gender	-8.71	2.35	-.62	-3.71*
Age	-0.07	0.15	-.09	-0.47
Education	-0.99	0.69	-.26	-1.44
Mean Errors-incongruent trials				
Constant	26.36	11.95		2.21*
Gender	-7.41	2.65	-.52	-2.80*
Age	-0.13	0.16	-.17	-0.82
Education	-1.00	0.77	-.26	-1.30

*Note.* In each equation, the three predictors (gender, age, and education) were entered simultaneously. Gender was coded 0 = female, 1 = male. Age and education were estimated in units of years.  $N = 30$ .

\* $p < .05$ , † $p < .10$ .

Table 2. *Confusion matrix indicating recognition rates for all emotion expressions shown to Fijian participants, Study 3.*

Emotion Label Used	Emotion Expression Displayed									
	Anger		Happiness		Pride		Shame		Neutral	
	Euro-Caucasian	African	Euro-Caucasian	African	Euro-Caucasian	African	Euro-Caucasian	African	Euro-Caucasian	African
Anger	<b>45%</b>	<b>30%</b>	0	0	0	2.5%	5%	5%	15%	15%
Disgust	5%	0	0	0	0	0	0	0	0	0
Fear	5%	10%	0	0	2.5%	2.5%	10%	5%	0	20%
Happiness	0	0	<b>90%</b>	<b>90%</b>	35%	45%	0	0	35%	0
Pride	25%	15%	10%	5%	<b>62.5%</b>	<b>50%</b>	5%	5%	30%	20%
Sadness	20%	45%	0	0	0	0	20%	40%	15%	15%
Shame	0	0	0	5%	0	0	<b>60%</b>	<b>45%</b>	0	25%
Nothing is Expressed	0	0	0	0	0	0	0	0	<b>0</b>	<b>5%</b>

*Note.* “Euro-Caucasian/African” refers to ethnicity of the target. Bolded values indicate predicted responses. Predicted responses for all emotions (not including neutral) were chosen at rates significantly greater than chance,  $p < .05$ . Cor

### Figure Legends

Figure 1. *Examples of stimulus photos used in Studies 2 and 3. Two versions of pride and shame were included for both targets; here, each target portrays a different version.*

Figure 2. *Mean explicit status ratings of four emotion expressions, among Fijians and North Americans, Study 1.*

Error bars denote standard error of the mean.

Figure 3. *Mean explicit status ratings of four emotion expressions, among Fijians and Caucasian North Americans only, Study 1.*

Error bars denote the standard error of the mean.

Figure 4. *Mean explicit status ratings of four emotion expressions shown by a Caucasian North American target, among North Americans only, Study 1.*

Error bars denote the standard error of the mean.

Figure 5. *Comparisons of mean RTs between congruent and incongruent blocks of the IAT, Study 2.*

The emotion labels for each bar indicate the expression that was paired with high-status in that block. For example, in the first pair of bars, the bar labeled “Pride” indicates the mean error-corrected RT for associating pride displays with high-status *and* shame displays with low-status (congruent pairings), and the bar labeled “Shame” indicates the mean error-corrected RT for associating pride displays with low-status and shame displays with high-status (incongruent pairings). Error bars denote standard error of the mean.

\* $p < .05$ .

Figure 1



Figure 2

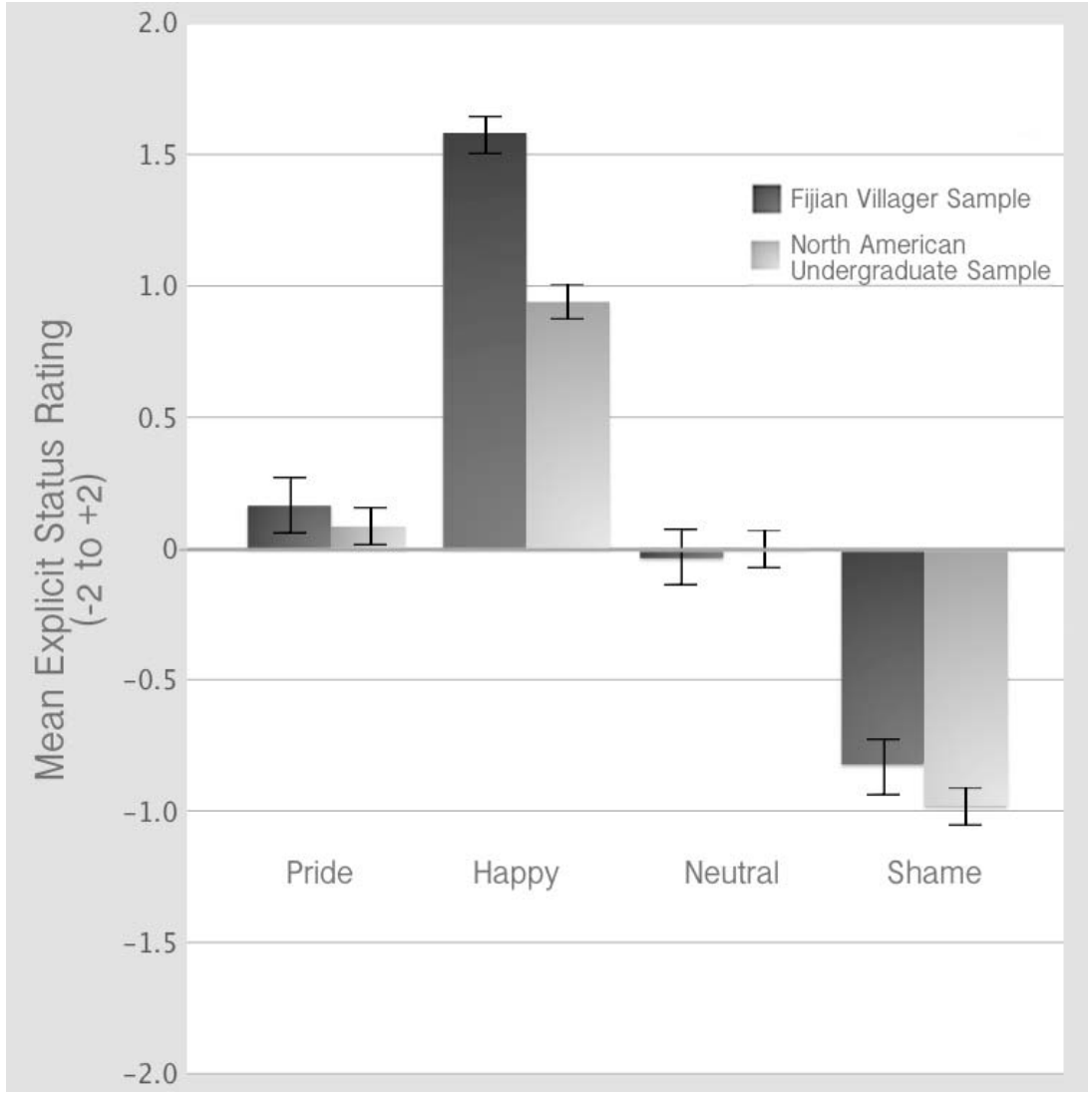


Figure 3

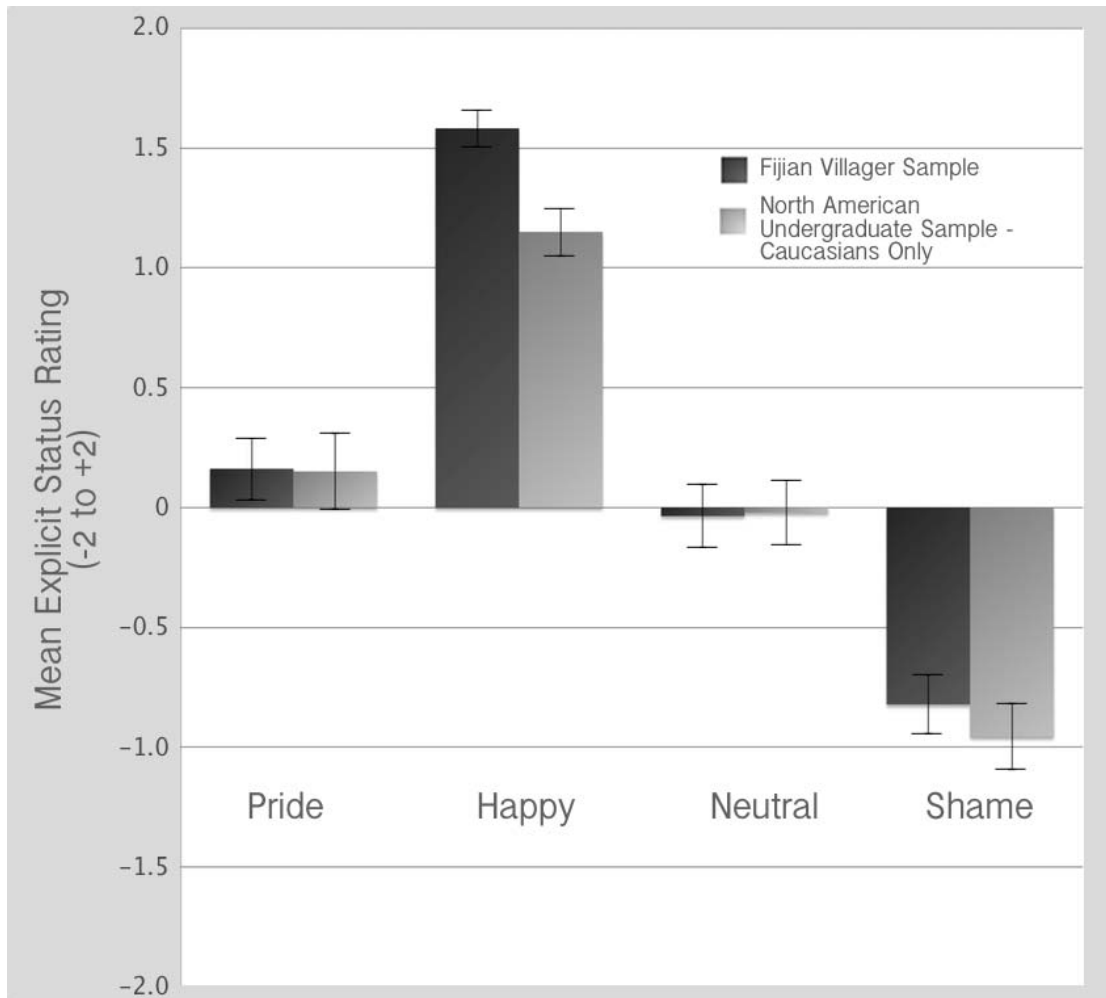


Figure 4

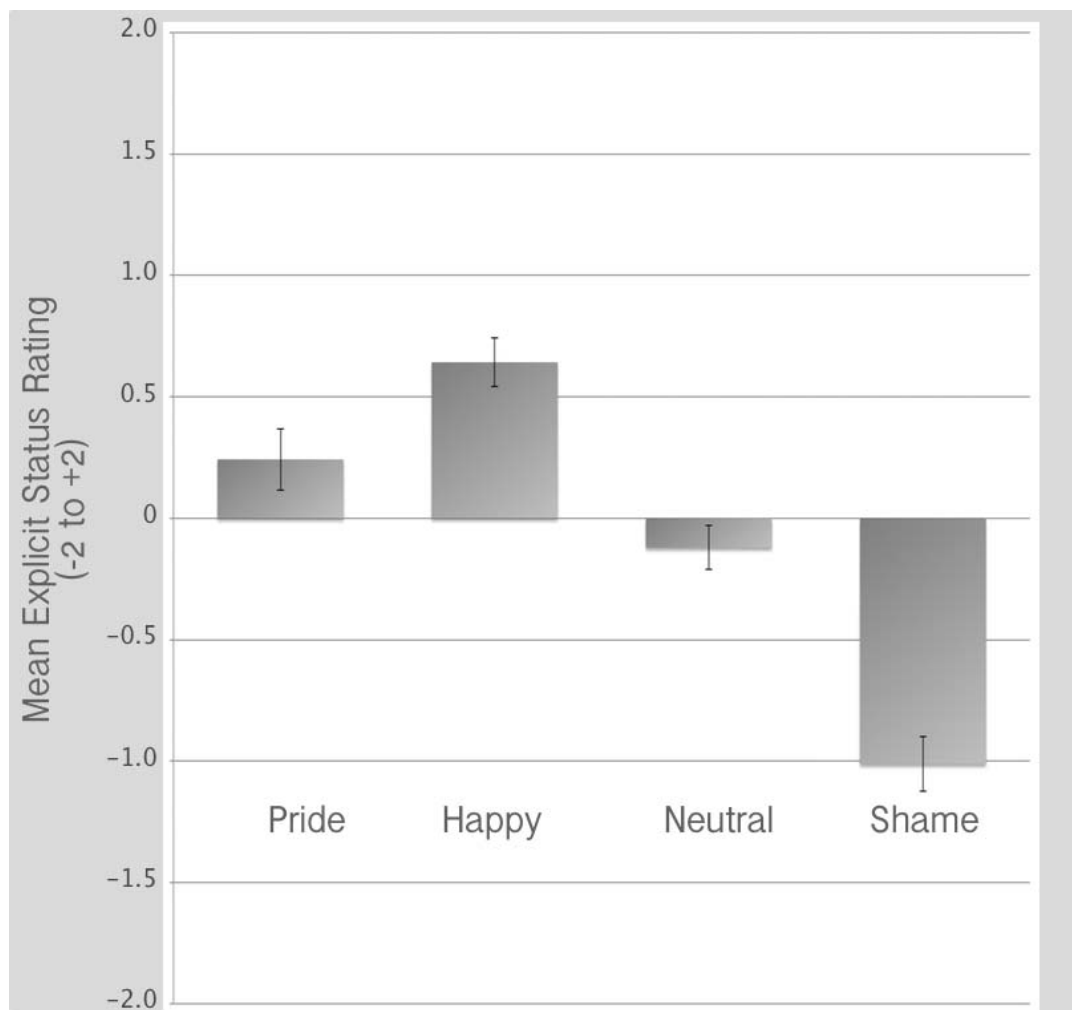
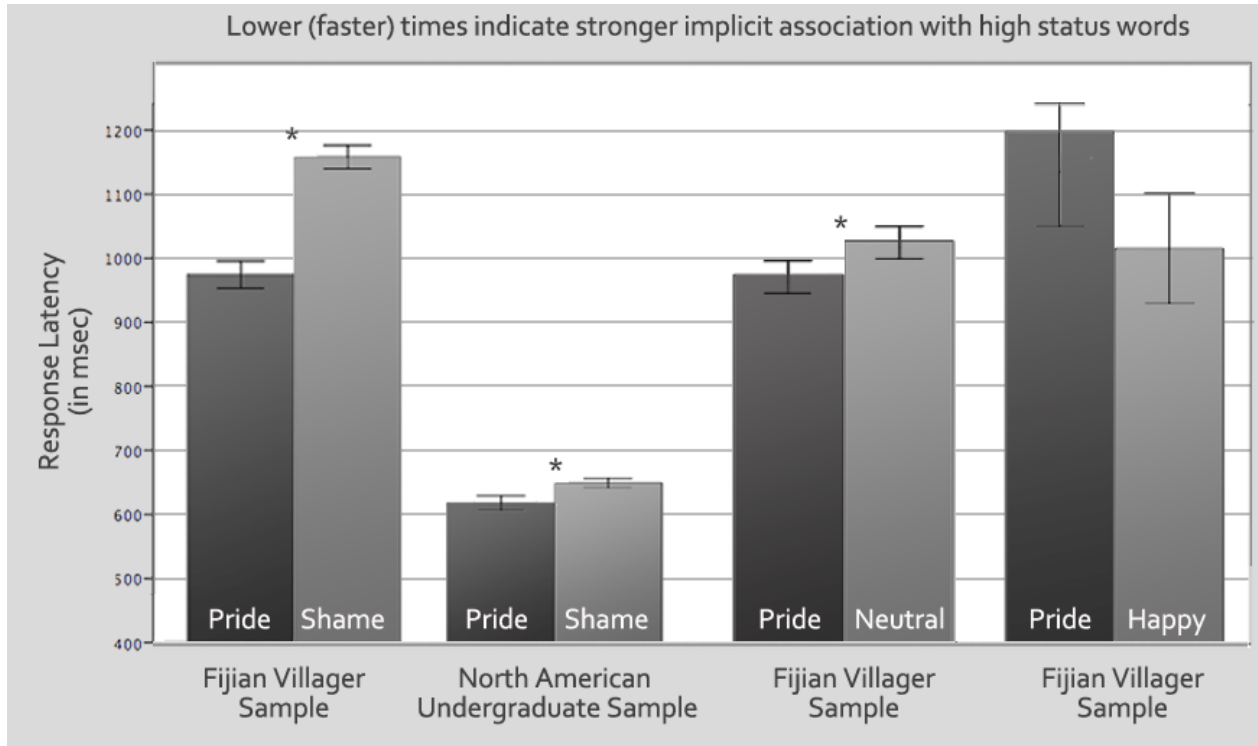




Figure 5



## Endnotes

<sup>1</sup> The interaction between emotion expression and sample was reduced when gender and age were entered as covariates,  $F(3, 194) = 2.20, p = .09$ .

<sup>2</sup> Correlations between positivity and status judgments for each expression, in the Fijian and North American sample, respectively, were: .62 and .53 for pride, both  $ps < .001$ ; .70 and .48 for happy, both  $ps < .001$ ; .86 and .46 for neutral, both  $ps < .001$ ; and .77 and .48 for shame, both  $ps < .001$ .

<sup>3</sup> As was the case in the main study, all results in the follow-up study held controlling for age, gender, and positivity ratings of each expression.

<sup>4</sup> Most of these individuals also participated in Study 1; however, that study was conducted several months *after* Studies 2 and 3, so these studies' results could not have been influenced by participants' exposure to the expressions, and judgments of them, in Study 1. It is also unlikely that the results of Study 1 were influenced by participants' prior exposure (in Studies 2 or 3) to the relevant expressions, given the length of time between studies. Unfortunately, it was simply not possible to sample a different group of participants for each study, given the very small Fijian population they were drawn from. Studies 2A, 2C, and 2D were run on separate samples of participants, sequentially in that order.

<sup>5</sup> Specifically, one-sample *t*-tests showed that D-measures were significantly greater than 0 in Study 2A (D-measure = .41) and Study 2C (D-measure = .34),  $ps < .05$ , and still not significantly different from 0 in Study 2D (D-measure = -.16). Furthermore, D-measures with *lailai* removed were highly correlated with original D-measures;  $rs = .96$  (Study 2A), .85 (Study 2C), and .98 (Study 2D); all  $ps < .05$ .

<sup>6</sup> In typical IAT experiments with university students, participants with notably high error rates (over 40% of trials), suggestive of random responding, are removed (e.g., Shariff & Tracy, 2009). Here we chose not to use this standard, given that Fijians were drawn from a unique population that had no prior computer experience, so a high error rate would not necessarily indicate random responding. To maintain consistency across studies, we included all participants in all IAT studies—including Study 2B—regardless of their error rates. However, we also re-ran all analyses excluding those participants who made more than 40% errors; doing so revealed an identical pattern of results. Specifically, this procedure resulted in the removal of 6% of Fijian participants in Study 2A, 7% of North American participants in Study 2B, 14% of Fijian participants in Study 2C, and 12% of Fijian participants in Study 2D. Doing so, we found that in Studies 2A, 2B, and 2C, resulting D-measures differed significantly from 0 (D-measures = .73, .41, and .39, respectively, all  $ps < .05$ ), as was the case in the full samples. In Study 2D, the D-measure remained non-significantly different from 0, D-measure = .17,  $p = .21$ , as was the case in the full sample. In addition, comparing the North American and Fijian results from Studies 2A and 2B still resulted in no significant differences between D-measures or RTs,  $ps > .20$ , but a significant difference in error rates,  $p < .001$ , as was the case with full samples included. Greenwald and colleagues (2003) recommend removing participants on the basis of an RT cut-off (i.e., those who make more than 10% of responses within 300ms, suggesting overly fast and thus random responding); re-analyzing the results using that standard also reveals an identical pattern of findings. In Study 2A, 6% of participants were removed, resulting in a D-measure of .68, significantly different from 0,  $t(31) = 4.40, p < .001$ ; in Study 2B, no participants were

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removed; in Study 2C, 11% of participants were removed, resulting in a D-measure of .41, significantly different from 0,  $t(24) = 2.46, p < .05$ ; and in Study 2D, 2% of participants were removed, resulting in a D-measure of -.19, still not significantly different from 0,  $t(55) = 1.57, p = .12$ .