Predicting moral outrage and religiosity with an implicit measure of moral identity

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1. Introduction

Moral identity, that is, the basing of one’s identity on the possession of moral values rather than other kinds of values, is theorized to play an important role in moral action. Moral identity develops throughout adolescence and even into adulthood, with morality and the self becoming increasingly integrated (Hardy & Carlo, 2011). When moral values such as honesty, compassion, and selflessness are internalized into the self-concept, moral behavior is thought to arise naturally. This is because behavior is motivated by a desire to maintain consistency with one’s identity, whatever that identity might be (Emde, Biringen, Clyman, & Oppenheim, 1991). In essence, a moral identity includes an individual’s inclinations of what to do and what not to do and regulates conflicts between personal desires and social obligations. Models of moral motivation have focused on moral reasoning and moral emotions, whereas only recently has moral identity been identified as an important predictor of moral cognitions and behavior (Hardy, 2006). Pratt, Hunsberger, Pancer, and Alisat (2003), for example, found that adolescents who described moral values as more central to their identity showed higher levels of community involvement. The present study addressed the relation between moral identity and moral emotion.

Most current measures of moral identity require research participants to explicitly report on their values. The most common methods involve asking them either to imagine a person with moral traits and then to rate how important it is for them to be like this person, or how much they try to present themselves like this person (Aquino & Reed, 2002), or to rate moral and non-moral traits in terms of how important they are to their sense of self (e.g., Barriga, Morrison, Liu, & Gibbs, 2001; Hardy, 2006). One problem with this methodology is the assumption that people are able to accurately verbalize aspects of their moral identities and the values that they have internalized without falling prey to social desirability and self-enhancement biases (Schnabel, Asendorpf, & Greenwald, 2007). However, it is not immediately obvious that this assumption is correct: For example, in a review of research on personality self-concept, Schnabel et al. (2007) have argued that it is important to differentiate between the explicit and implicit self-concept, as explicit representations of personality are, in fact, susceptible to self-presentation biases as well as introspective limits. Despite these limitations, a number of studies measuring moral identity using explicit methods have been successful in predicting certain moral outcomes (e.g., Aquino & Reed, 2002; Pratt et al., 2003).

An important consideration in evaluating the effectiveness of explicit moral identity measures is the distinction between automatic and controlled processing. For instance, one reason that measures of moral reasoning predict only small amounts of variance in moral behavior (e.g., Hardy, 2006; Walker & Hennig, 1997), is that reasoning about moral dilemmas requires controlled, deliberate processing, whereas responses to real-life moral situations are often based on intuitions, or automatic reactions (Haidt, 2001; Haidt & Joseph, 2004). In a similar vein, explicit measures of moral identity require participants to think deliberately about the importance of moral personality traits to their identity. Although these explicit measures may be expected to predict moral outcomes that similarly require controlled processes, such as responses to hypothetical dilemmas (Perugini & Leone, 2009) and
explicit self-reports of moral behavior (Reynolds & Ceramic, 2007), they may be less likely to predict moral responses in situations requiring automatic responses (e.g., helping a person in distress). Thus Batson and colleagues (Batson, Thompson, & Chen, 2002; Batson, Thompson, Seufferling, Whitney, & Strongman, 1999), for example, have consistently demonstrated what they label as “moral hypocrisy”, that is, the inability of explicit reports of self-importance of moral values to predict moral action (e.g., cheating). We suggest that the measurement of moral identity can be significantly improved with the use of an implicit, automatic assessment of moral identity, at least when predicting impulsive moral responses.

One way that researchers have attempted to operationalize the implicit moral self or identity is by measuring the chronic accessibility of moral words through lexical decision tasks and spontaneous trait inferences in response to dispositional cues (Narvaez, Lapsley, Hagele, & Lasky, 2006). Another approach has recently been proposed by Perugini and Leone (2009) who devised an implicit association test (IAT) to measure moral identity. The task, based on the procedure developed by Greenwald, McGhee, and Schwartz (1998), measures the latency to associate “me” and “others” with moral words (e.g., altruistic and immoral words (e.g., deceptive, cheater). Perugini and Leone demonstrated that an implicitly, but not explicitly, measured moral identity predicted actual moral action whereas an explicitly measured moral identity, but not an implicitly measured one, predicted responses to hypothetical scenarios. Their findings, then, suggest that implicit measures tapping into automatic associative processes may be better predictors of moral behaviors that are equally automatic, or less susceptible to deliberation (i.e., when there is no time for deliberate decision making). In the present study we evaluated this suggestion by considering the relation between explicit and implicit measures of moral identity and moral outrage and religiosity.

2. Moral outrage

Perugini and Leone’s (2009) research linked implicit moral identity with moral behavior in an attempt to better predict how people would act in real life, rather than in hypothetical situations. However, moral behavior as measured in laboratory settings is still somewhat removed from everyday behavior and can be motivated by reasons that are not based on internalized moral beliefs, for example, in order to make a good impression on the researcher. One way to avoid this type of bias is to measure physiological responses. The importance of emotional movements to the motivation of moral behaviors has been demonstrated empirically (e.g., Haidt & Joseph, 2004; Tangney, Stuewig, & Mashek, 2007) and, therefore, assessing physiological, emotional reactions in a moral context seems an important way to validate an implicit measurement of moral identity. Specifically, we used physiological measures to assess the presence of moral outrage.

Moral outrage is a form of anger provoked by the violation of a moral standard or principle and is seen as central to courage, moral agency, and moral motivation (Batson et al., 2007; Haidt, 2003). When people feel that a moral standard has been violated by others, the experience of anger motivates them to correct the situation, whether through aid to the victim or punishment to the transgressor. Perceptions of injustice also are tied to feelings of anger, and people report that their most common response to injustice is anger (see Miller, 2001 for a review). Additionally, emotional reactions, and moral outrage in particular, predict whether or not individuals confronted with inequality will commit to help those who are disadvantaged (Montada, Schmitt, & Dalbert, 1986). Given the link between moral identity and moral emotions (e.g., Tangney et al., 2007), and particularly the impulsive and automatic nature of emotional responses, we hypothesized that an implicit measure of moral identity would predict reactions of moral outrage to evidence of moral violations better than an explicit measure of moral identity.

2.1. Measuring moral outrage

Previous research has established a relation between anger and increases in blood pressure and heart rate (Christie & Friedman, 2004; Ekman, Levenson, & Friesen, 1983). Herrero, Gadea, Rodriguez-Alarcon, Espter, and Salvador (2010) found that anger induction leads to increases in cardiovascular reactivity, specifically in heart rate and diastolic blood pressure. Significant systolic blood pressure increases (typical of fear responses) were not found, a similar finding to that of Bongard, Pfeiffer, d’Absi, Hodapp, and Linnenkemper (1997). Based on previous research using heart rate and blood pressure to assess anger in response to offenses such as betrayal and lies (e.g., vanOyen Witvliet, Ludwig, & Vander Laan, 2001), we used physiological responses to assess anger in response to anger-inducing events that had clear moral implications. Thus, in the present research, moral outrage was operationalized as increases in heart rate and diastolic blood pressure in response to violations of moral principles.

3. Religion and moral identity

3.1. Religion

Past research has suggested that religious participation is associated with the development of a moral identity, at least when moral identity is measured explicitly (e.g., Hart & Atkins, 2004; Maclean, Walker, & Matsuba, 2004). It is argued that individuals who attend religious services have more exposure to moral claims and that religion provides a context for reflection on moral issues (Hart & Atkins, 2004). However, the relation between religion and moral identity measured implicitly has not been explored. If religious individuals have more experience talking about moral characteristics, for example, they may simply be more likely to report these on an explicit measure, although there may be no differences in the spontaneous associations religious and nonreligious individuals make between moral traits and their own personality structure. In accord with this possibility, Maclean et al. (2004) found that, although religious orientation was correlated with self-reported altruism, it did not explain a significant amount of variance when entered into a hierarchical regression with moral reasoning and identity integration. These researchers also found that the correlation between religious orientation and altruism disappeared once impression management and self-deception were controlled for (Maclean et al., 2004). Religiosity is predominantly (as in the current study) measured through self-reports, and previous research has shown associations between these reports and explicit moral identity (Vitell et al., 2009). Thus, we hypothesized that self-reported religiosity would be primarily related to explicit moral identity and comparatively less related to implicit, automatic representations of moral identity.

4. Present research

The present research aimed to demonstrate the utility of implicit moral identity assessment in the prediction of moral outcomes. Its primary goal was to explore moral identity, measured implicitly, as a predictor of moral outrage, measured physiologically. Based on previous research, we expected that moral identity assessed through automatic processes would better predict automatic moral emotional reactions, compared to explicit, controlled
measures of moral identity. We were also interested in comparing implicitly and explicitly measured moral identity as predictors of religiosity, with the idea that explicit reports of moral identity would be more predictive of thoughtful, reflective assessments of one's own religiosity than automatic moral identity processes. We hypothesized that:

1. Implicit moral identity would relate positively to moral outrage (increased heart rate and diastolic blood pressure) whereas explicit moral identity would have a lesser association with moral outrage.
2. Explicit moral identity would relate positively to high levels of self-reported religiosity, whereas implicit moral identity would have a lesser association with self-reported religiosity.

5. Method

5.1. Participants

Participants were 103 (72 male and 31 female) undergraduates (mean age = 20.14 years, SD = 4.06) from a large, multicultural Canadian city. They came from the following ethnic backgrounds: Western European (22.3%), East Asian (24.3%), Eastern European (14.6%), South Asian (13.6%), Southeast Asian (9.7%), and 15.5% from other backgrounds or multiple backgrounds. Typical of urban areas in Canada, 26.8% of the sample reported being atheist or agnostic. The remainder identified themselves as Catholic from other backgrounds or multiple backgrounds. Typical of urban areas in Canada, 26.8% of the sample reported being atheist or agnostic. The remainder identified themselves as Catholic (22.7%), Protestant (12.3%), Muslim (7.2%), Jewish (4.1%), Buddhist (4.1%), Greek Orthodox (4.1%), Hindu (3.1%), and other (15.6%).

5.2. Measures

5.2.1. Explicit moral identity

Explicit moral identity was measured with a validated and commonly used self-report measure of moral identity, the Good-Self Assessment (GSA; Barriga et al., 2001), originally developed by Arnold (1993). The GSA was chosen for our explicit measure based on its frequent use as an established measure of explicit moral identity. This scale measures the centrality of moral traits to an individual's self-understanding. It consists of 16 questions which ask the participant “How important is it to you that you are...?” Eight questions include a moral characteristic (e.g., honest/fair) while the other eight include a non-moral characteristic that is still socially desirable (e.g., outgoing/sociable). Previous research has established both the distinction between the moral and non-moral items and also the internal consistency of each group of items (Barriga et al., 2001). Participants rated each item on a scale from 1 (not important to me) to 5 (extremely important to me). Earlier scoring schemes of the GSA simply subtracted the moral trait ratings from the non-moral trait ratings, however these difference scores are unreliable and do not make clear which set of traits are contributing to the score's validity (Cohen & Cohen, 1983). In accord with more recent studies (e.g., Krettenauer, 2011) an overall score was created by predicting ratings on moral items from non-moral items in a linear regression and using the standardized residual as a score of explicit moral identity. Thus, more positive scores represent a greater centrality of moral traits after taking into account the centrality of other socially desirable traits to that individual. Moral items had a Cronbach's alpha of .88 and non-moral items had an alpha of .69 (note that this category includes a variety of personality characteristics).

5.2.2. Implicit moral identity

Implicit moral identity was measured using Perugini and Leone's (2009) IAT. The IAT (Greenwald et al., 1998) involves a computer-based keyboard sorting procedure that produces a difference score for reaction times based on association strengths, with stronger associations leading to faster reactions. Participants were asked to assign stimulus words presented in the center of the screen as quickly and accurately as possible to a target dimension (moral vs. immoral) and a category dimension (self vs. other), with these dimensions presented in the upper right and left hand corners of the screen and with a key stroke indicating whether the stimulus word belonged on the right or left. The stimulus words were the ones used by Perugini and Leone: honest, faithful, sincere, modest, and altruist (moral) and cheater, dishonest, deceptive, arrogant, and pretentious (immoral) and pronouns referring to the self or others. Although these items differed from our explicit moral identity items, the original terms used by Perugini and Leone were used to maintain consistency with their established measure. In the critical phase of the task participants had to make a decision for stimuli from two dimensions simultaneously, one from the target dimension and one from the category dimension. They were presented with two kinds of combinations. One combination was moral and self (paired on the same side) vs. immoral and other (paired on the other side), and the other combination was moral and other vs. immoral and self. Final scores were calculated as the difference in average response latency between the two combination phases using the D600 algorithm for IAT scoring (see Greenwald, Nosek, & Banaji, 2003). The alpha reliability coefficient for the latencies in response to the first pairing was .79 and the coefficient for the second pairing was .85.

5.2.3. Moral outrage

Moral outrage was measured as participants' physiological reactions (heart rate and diastolic blood pressure) when listening to audio recordings of opinions that violate moral principles. After the cuff of a portable blood pressure monitor was attached to their non-dominant arm, participants put on a set of headphones and two measurements of heart rate and blood pressure were taken to familiarize them with the procedure. Participants then listened to five audio recordings and were instructed to close their eyes while listening and to think about how each one made them feel. Heart rate and blood pressure were measured 120 s into each recording. Between the recordings, participants were asked to briefly write how they felt about the recording to ensure that measurements were not made too close together.

Two neutral recordings were played first and consisted of a movie review and a description of an online dating experience. These provided a measure of physiological responses to neutral (non-moral) stimuli. The three subsequent recordings, designed to induce moral outrage, included (1) someone talking about an actual incident where a man who was stabbed while rescuing a woman was subsequently left to die on the sidewalk as pedestrians walked by; (2) someone arguing for privatized health care because poor people are lazy and a drain on society; and (3) someone saying that the people of Haiti deserved the natural disaster they had experienced, that they should be left to die, and that other countries have no obligation to provide them with aid. Our two measures of moral outrage were the average heart rate in response to the three latter recordings and the average diastolic blood pressure in response to the latter three recordings. Average systolic blood pressure was used to confirm that the arousal we were measuring was indeed anger (i.e., systolic blood pressure should not be related to moral identity). The average of the two measures of heart rate, diastolic blood pressure, and systolic blood pressure in response to neutral recordings were used in our analyses to control for individual differences in heart rate and blood pressure.

5.2.4. Religiosity

Religiosity was measured first with the 20-item Religious Orientation Scale, which has shown high internal consistency in
different cultures (Allport, 1950). This scale measures the extent to which religious activities (e.g., attending places of worship) are done for intrinsic vs. extrinsic reasons. The items comprise three subscales: intrinsic, personal extrinsic, and social extrinsic. Any items referring to Christianity (i.e., “Bible,” “church”) were modified to be inclusive of all religions (i.e., “religious texts,” “places of worship”). Sample items are: “I try hard to carry my religion over into all my other dealings in life” (intrinsic), “The primary purpose of prayer is to gain relief and protection” (personal extrinsic), and “Places of worship (e.g., church, synagogue, mosque) are most important as a place to form social relationships” (social extrinsic). All items were rated on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Additionally, the 18-item Post-Critical Belief Scale (Duriez, Soenens, & Hutsebaut, 2005) was used to measure four attitudes about religion that vary along two dimensions: literal inclusion, literal exclusion, symbolic inclusion, and symbolic exclusion. Duriez, Soenens, Neyrinck, and Vansteenkiste (2009) found high internal consistency within each of the four categories and high factor loadings of items on each category. The inclusion–exclusion dimension reflects the degree to which objects of religious interest are incorporated into one’s life and the literal–symbolic dimension the degree to which religion is interpreted literally or symbolically. Again, any items that were specific to Christianity were modified to be inclusive of all religions (e.g., “Christianity” became “my religion”; “Bible” became “religious texts”). Examples of items are: “I think that stories in religious texts should be taken literally, as they are written” (literal inclusion); “The world of the stories in religious texts is so far removed from us that it has no relevance” (literal exclusion); “Religious text is a rough guide in the search for a God and not a historical account” (symbolic inclusion) and “My ideology is only one possibility among so many others” (symbolic exclusion). All items were scored on a 7-point Likert-type scale ranging from 1 (completely disagree) to 7 (completely agree).

The seven subscales of the two religiosity measures were entered into a principal component analysis with varimax rotation used for interpretation of factors. Two factors with eigenvalues greater than 1 emerged. The first factor was labeled “religiosity” and consisted of all subscales except for two, the Literal Exclusion and Symbolic Exclusion subscales of the Post-Critical Belief Scale. These two subscales, which assess the extent to which religion is excluded from one’s life, loaded on the second factor, labeled “religious exclusion.” Analyses were conducted using the factor scores obtained for each of these two dimensions.

5.2.5. Political orientation as a control variable

At least one, and perhaps two, of the audio recordings designed to induce moral outrage had the potential of differentially eliciting outrage based on the participants’ political orientation. Privatized health care and opposition to foreign aid are issues that liberals are likely to be more angered by than conservatives. As a result, political orientation was measured and controlled for in the analyses. Political orientation was assessed by asking participants to rate the strength of their liberal political views on 7-point scales. Specifically, participants were asked to “Please circle the number that indicates the degree to which the term ‘liberal’ describes your political ideology.”

5.3. Procedure

Participants first completed Perugini and Leone’s (2009) implicit association moral identity computer task while seated in a quiet room. Next, they completed a demographic questionnaire that included the rating of liberal political orientation and then the questionnaires assessing explicit moral identity and religiosity. The last two sets of questionnaires were presented in counterbalanced order. Participants were then administered the moral outrage induction/heart rate measure. After all assessments, participants were fully debriefed.

6. Results

Means and standard deviations for all continuous study variables can be found in Table 1. Table 2 presents the correlations among religiosity, religious exclusion, implicit moral identity, explicit moral identity, liberal orientation, gender, and cardiovascular activity. Gender was initially included in all of the analyses reported below, but was removed from the final analyses as it was not a significant predictor in any case nor were any interactions with gender significant.

6.1. Moral outrage

6.1.1. Heart rate

A linear regression was used to predict heart rate scores in response to moral violations from implicit and explicit moral identity. In the first step, heart rate during the neutral recordings and the liberal political scores were entered as controls. In the second step, implicit moral identity and explicit moral identity were added. This model was significant, \( F(4,98) = 201.92, p < .001 \). A significant \( R^2 \) change indicated that the second step added significantly to the model prediction, \( F \)-change = 8.01, \( R^2 \) change = .02, \( p = .001 \). Neutral recording heart rate activity significantly predicted heart rate in response to the moral violations, \( \beta = .92, t(98) = 27.10, p < .001 \). Importantly, implicit moral identity scores were also significantly predictive of final heart rate scores, \( \beta = .13, t(98) = 3.89, p < .001 \), whereas explicit moral identity scores were not, \( \beta = -.04, t(98) = -1.03, p = .31 \) (see Table 3). A scatterplot with regression line is shown in Fig. 1A of the association between implicit moral identity and heart rate (regression residuals to account for initial heart rate).

6.1.2. Diastolic blood pressure

A linear regression was used to predict diastolic blood pressure scores in response to moral violations from implicit and explicit moral identity. In the first step, diastolic blood pressure during the neutral recordings and the liberal political scores were entered as controls. In the second step, implicit moral identity and explicit moral identity were added. This model was significant, \( F(4,98) = 34.83, p < .001 \). A significant \( R^2 \) change indicated that the second step added significantly to the model prediction, \( F \)-change = 2.92, \( R^2 \) change = .03, \( p = .05 \). Neutral recording diastolic blood pressure activity significantly predicted diastolic blood pressure in

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explicit moral identity(^a)</td>
<td>0 (1.00)</td>
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<tr>
<td>Implicit moral identity</td>
<td>-17.53 (286.59)</td>
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<tr>
<td>Baseline diastolic blood pressure</td>
<td>69.73 (7.79)</td>
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<tr>
<td>Baseline systolic blood pressure</td>
<td>117.37 (12.45)</td>
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<tr>
<td>Baseline heart rate</td>
<td>71.22 (12.32)</td>
</tr>
<tr>
<td>Post-induction diastolic blood pressure</td>
<td>71.11 (7.20)</td>
</tr>
<tr>
<td>Post-induction systolic blood pressure</td>
<td>116.74 (12.17)</td>
</tr>
<tr>
<td>Post-induction heart rate</td>
<td>75.38 (12.31)</td>
</tr>
<tr>
<td>Religiosity(^b)</td>
<td>0 (3.98)</td>
</tr>
<tr>
<td>Religious exclusion(^b)</td>
<td>0 (1.64)</td>
</tr>
<tr>
<td>Liberal orientation</td>
<td>5.08 (1.47)</td>
</tr>
</tbody>
</table>

\(^a\) Explicit moral identity scores are the standardized residuals of ratings of moral traits predicted from non-moral traits.

\(^b\) Religiosity and religious exclusion scores are the factor scores obtained from a principal components analysis.
Table 2
Intercorrelations among study variables.

<table>
<thead>
<tr>
<th></th>
<th>G</th>
<th>IMI</th>
<th>EMI</th>
<th>R</th>
<th>RE</th>
<th>LO</th>
<th>HR</th>
<th>DBP</th>
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<tr>
<td>Gender (G)</td>
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<td></td>
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<tr>
<td>Implicit moral identity (IMI)</td>
<td>.15</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Explicit moral identity (EMI)</td>
<td>.17</td>
<td>.10</td>
<td></td>
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<td></td>
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<tr>
<td>Religiosity (R)</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Religious exclusion (RE)</td>
<td>-.004</td>
<td>-.04</td>
<td>-.26</td>
<td>-.18</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>Liberal orientation (LO)</td>
<td>-.14</td>
<td></td>
<td>.17</td>
<td></td>
<td>-.13</td>
<td></td>
<td>.15</td>
<td></td>
</tr>
<tr>
<td>Heart rate (HR)</td>
<td>-.03</td>
<td>.36</td>
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<td>-.02</td>
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<td>.09</td>
<td>.05</td>
<td></td>
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<tr>
<td>Diastolic BP (DBP)</td>
<td>.03</td>
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<td></td>
<td>.06</td>
<td>.03</td>
<td>.04</td>
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<tr>
<td>Systolic BP (SBP)</td>
<td>-.11</td>
<td>-.11</td>
<td>-.03</td>
<td>.03</td>
<td>.01</td>
<td>-.12</td>
<td>.21</td>
<td></td>
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</table>

Note: BP, Blood pressure; HR, DBP, and SBP refer to regression residuals obtained when predicting post moral violation activity from activity in response to neutral audio recordings.

*p < .05.
**p < .01.

Table 3
Regressions predicting outcomes from implicit and explicit moral identity.

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Heart rate β(t)</th>
<th>Diastolic blood pressure β(t)</th>
<th>Systolic blood pressure β(t)</th>
<th>Religiosity β(t)</th>
<th>Religious exclusion β(t)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activity in neutral condition</td>
<td>.92 (27.10)***</td>
<td>.77 (11.72)***</td>
<td>.87 (16.89)***</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Liberal</td>
<td>-.01 (-.16)</td>
<td>.05 (.78)</td>
<td>-.07 (-1.31)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Implicit moral identity</td>
<td>.13 (3.89)***</td>
<td>.16 (2.39)</td>
<td>-.06 (-1.23)</td>
<td>-.02 (-.26)</td>
<td>-.04 (-.43)</td>
</tr>
<tr>
<td>Explicit moral identity</td>
<td>-.04 (-1.03)</td>
<td>-.02 (-.37)</td>
<td>-.004 (-.08)</td>
<td>.34 (3.64)***</td>
<td>-.20 (-2.00)</td>
</tr>
</tbody>
</table>

Note: β(t) are presented for the final models.

***Significance at the p < .01 level.
* β = Standardized beta coefficient, t = t-value.
**Significance at the p < .05 level.
*** Significance at the p < .001 level.

Fig. 1. Implicit moral identity predicting standardized residuals of heart rate scores (A), diastolic blood pressure scores (B), and systolic blood pressure scores (C).
response to the moral violations, $\beta = .77$, $t(98) = 11.72$, $p < .001$. Importantly, implicit moral identity scores were also significantly predictive of final diastolic blood pressure scores, $\beta = .16$, $t(98) = 2.39$, $p = .02$, whereas explicit moral identity scores were not, $\beta = -.02$, $t(98) = -.37$, $p = .72$ (see Table 3). A scatterplot with regression line is shown in Fig. 1B of the association between implicit moral identity and diastolic blood pressure (regression residuals to account for initial diastolic pressure).

6.1.3. Systolic blood pressure

A linear regression was used to predict systolic blood pressure scores in response to moral violations from implicit and explicit moral identity. In the first step, systolic blood pressure during the neutral recordings and the liberal political scores were entered as controls. In the second step, implicit moral identity and explicit moral identity were added. This model was significant, $F(4, 98) = 73.09$, $p < .001$. However, the $R^2$ change was not significant, indicating that the second step did not add significantly to the model prediction, $F$-change $= .76$, $R^2$ change $= .004$, $p = .47$. Systolic blood pressure during the neutral recordings was the only significant predictor of systolic blood pressure in response to the moral violations, $\beta = .87$, $t(98) = 16.89$, $p < .001$. Implicit moral identity scores, $\beta = -.06$, $t(98) = -1.23$, $p = .22$, and explicit moral identity scores, $\beta = -.004$, $t(98) = -.08$, $p = .94$, were not predictive of final systolic blood pressure scores (see Table 3). A scatterplot with regression line is shown in Fig. 1C of the association between implicit moral identity and systolic blood pressure (regression residuals to account for initial systolic pressure).

6.2. Self-reported religiosity

Religiosity factor scores from the factor analysis ranged from –8.05 to 9.49 (SD = 3.98) and religious exclusion factor scores ranged from –3.35 to 3.88 (SD = 1.64). The correlations of implicit moral identity and explicit moral identity with religiosity (in Table 2) differed significantly from one another ($z = -2.70$, $p < .001$). Further, a linear regression predicting religiosity from implicit and explicit moral identity was significant, $F(2, 100) = 6.66$, $p = .002$. Implicit moral identity was not a significant predictor ($\beta = -.02$, $t = -.26$, $p = .80$) whereas explicit moral identity was a significant predictor ($\beta = .34$, $t = 3.64$, $p < .001$; see Table 3).

Although the correlation between explicit moral identity and the second factor, religious exclusion, was significant and that between implicit moral identity and religious exclusion was not, the correlations did not differ significantly from each other. A linear regression predicting religious exclusion from implicit and explicit moral identity was also not significant, $F(2, 100) = 2.10$, $p = .13$ (see Table 3).

7. Discussion

The present study adds to a substantial body of research indicating that measures of implicit processing of social information can reveal underlying attitudes that are not revealed by explicit measures of the same construct. We compared an implicit association test devised to assess moral identity with a self-report measure of moral identity and found that the two were associated with different outcomes. Our findings provide support for Perugini and Leone’s (2009) claim that the implicit measurement of moral identity is more likely to predict real-life moral outcomes than the traditional explicit assessment. In two studies, conducted in the UK and in Italy, Perugini and Leone found that an implicit measure of moral identity predicted the ability to resist temptation (e.g., to return an undeserved lottery ticket) whereas an explicit measure did not. Contrarily, the explicit measure predicted moral responses to hypothetical vignettes whereas the implicit one did not. We extended these findings to a situation even less affected by the artificiality of the laboratory by showing that implicit moral identity was a predictor of physiologically-measured moral outrage whereas explicit moral identity was not.

In addition, we added religiosity as a dependent variable and, in accord with our hypothesis, found religiosity to be predicted by explicit but not implicit moral identity. Overall our results highlight the distinction between implicitly and explicitly measured moral identity: Whereas explicit moral identity predicted religiosity, implicit moral identity predicted what could be seen as a more automatic, moral outcome – moral outrage in response to violations of moral principles.

7.1. Moral emotions and moral outrage

Although moral emotions are typically considered to be self-conscious emotions such as guilt, pride, and shame, moral outrage is also recognized as an emotional response that can occur in a moral context (Montada, 1993). We operationalized moral outrage as increased heart rate and diastolic blood pressure and found that these reactions to audio recordings of individuals making morally offensive remarks were indeed predicted by implicitly assessed moral identity but not by participants’ self-reports of their moral values. Moreover, changes in systolic blood pressure, a reflection of fear, were unrelated to either measure of moral identity. Thus we found evidence for the theorized link between moral identity and moral emotions using innovative measures of these constructs (implicit associations and cardiovascular activity instead of the typical self-reports).

We found that an explicit measure of moral identity did not predict moral outrage, which at first glance seems inconsistent with previous studies linking explicit moral identity to feelings of negative affect after violations of moral obligations (Johnston & Krettenauer, 2011). However, Johnston and Krettenauer’s measure was based on the reactions of their research participants’ responses to hypothetical vignettes depicting moral dilemmas. Similarly, Hardy (2006) reported that moral (prosocial) identity and the emotion of empathy were correlated, but with empathy measured by self-report. The present study, then, in combination with evidence discussed above, suggests that explicit measures of moral identity can predict hypothetical emotional responses and self-reports of negative affect, whereas implicit measures are more likely to predict heightened physiological reactions (which are not subject to conscious control) to morally offensive material (Hardy, 2006; Johnston & Krettenauer, 2011; the present study).

In addition to providing evidence for a double dissociation between implicit and explicit measures of moral identity, our findings also provide some initial support for the measurement of moral outrage as a morally-relevant emotion. Based on the fact that anger provides motivation to defend oneself, Hoffman (2001) has argued that empathic anger (vicarious anger at seeing another person victimized) acts as a prosocial or moral motive and mobilizes energy to defend victims. However, Hoffman points out the absence of empirical research on empathic anger. Our measure of moral outrage is somewhat analogous to Hoffman’s empathic anger, although our “victims” were either generalized groups (i.e. the people of Haiti, people who cannot afford healthcare) or unknown others (that is, a person who was stabbed on the streets of New York). Although we did not assess participants’ motivations to help these victims, their physiological responses were predicted by implicit moral identity scores. Perhaps high levels of implicit moral identity lead people to experience anger or outrage when witnessing the victimization of others, in turn motivating prosocial behavior and defense of the victims.
7.2. Religion and moral identity

As hypothesized, self-reported religiosity was better predicted by explicit moral identity than by implicit moral identity. The conscious, reflective nature of self-reported devotion and adherence to religious principles lends itself to such better prediction by similarly explicit, conscious measures of moral identity. The lack of association between our measure of religiosity and implicit moral identity is contrary to arguments asserting religion as the source of morality, and instead suggests that morality can arise from diverse ideological backgrounds and beliefs. It should be noted that an implicit measure of religiosity might yield different results. Little research has considered the concept of implicit religiosity, although one study by Sharrif, Cohen, and Norenzayan (2008) used an IAT associating “religion” terms with “truth” terms in an attempt to assess implicit religiosity (i.e., agreement that religious ideas are truth/fact). Possibly such an implicit measure might be associated with a different outcome. At the moment, however, it can be concluded that self-reported religious individuals do report themselves to be more moral than less religious people, perhaps because they simply spend more time thinking about moral concerns, characteristics, or models (Hart & Atkins, 2004).

7.3. Dual processes of moral identity

We have suggested that the dissociation between implicit and explicit measures of moral identity in predicting morally relevant outcomes arises primarily from different levels of processing. Dual-system models of social cognition propose two mental systems that interact to produce social judgment and behavior: reflective/controlled processing and impulsive/automatic processing (e.g., Deutsch & Strack, 2006; Smith & DeCoster, 2000). The impulsive system automatically responds to a situation based on previously learned associations, affective representations, and genetic preparedness while lacking awareness of these responses. The reflective system, on the other hand, influences behavior through judgmental processes grounded in intentions and symbolic representations and allows for correction of automatic cognitions based on situational factors (Deutsch & Strack, 2006). Research on interracial attitudes, for example, has shown that self-reports of racial attitudes predict verbal behavior towards members of another ethnic group (both regulated by the reflective system) whereas implicit racial attitudes predict nonverbal, observed interracial behaviors (both regulated by the impulsive system; Dovidio, Kawakami, & Gaertner, 2002).

This same dissociation is seen in our results, and suggests that moral identity operates through dual processes similar to other aspects of social cognition such as interracial attitudes. Future studies of moral identity should reflect this distinction with a consideration of how both implicit/impulsive and explicit/reflective processes contribute to moral cognitions and behavior. For example, certain types of moral behavior may result predominately from the impulsive moral system (e.g., helping in dire, emergency situations) whereas other types may result from the reflective moral system (e.g., volunteering for a charity). Further, these two moral systems may be differentially linked to prosocial and antisocial behavior, based on the greater impulsivity inherent in many immoral acts (e.g., Loeber, 1990) as compared to many proactive moral behaviors, and also based on the distinction between inhibiting an impulse (to act antisocially) and acting in accordance with an initial impulse (to act prosocially).

Although dual process models of social cognition are commonplace in social psychology, only recently have intuitionist or automatic models of morality been proposed in the moral psychology literature (e.g., Haidt, 2001). Theories of moral reasoning, behavior, and motivation have traditionally focused solely on conscious, rational, and deliberate processes (e.g., Kohlberg, 1984; Rest, Narvaez, Bebeau, & Thoma, 1999; Turiel, 1983). Increasingly, however, models of moral intuitions are gaining prominence (Lapsley & Hill, 2008). For example, in Haidt’s (2001) social intuitionist model, moral intuitions (sudden affectively valenced judgments) precede moral reasoning: Moral reasoning is only a post hoc rationalization to explain one’s automatic judgment. In a different conceptualization, Lapsley and Narvaez (2004) operationalize moral expertise as the accessibility of moral concepts and schemas, with moral experts showing superior information processing skills on morally-relevant materials compared to moral novices. Our study provides evidence for an additional automatic moral process—the automatic associations between moral personality traits and the self-concept, or implicit moral identity. Considering both intuitive and rational aspects of morality, and the links between them, will be an important future direction for research in moral psychology.

7.4. Limitations

In the current study, moral outrage and religiosity were conceptualized as dependent variables predicted by moral identity. Because of the correlational nature of this research, of course, directionality cannot be assumed. However, in support of a directional effect, previous research in this area has provided evidence that moral emotions mediate the link between moral identity and moral behavior (Johnston & Krettenauer, 2011), suggesting that moral identity does indeed precede the development or expression of moral emotions (in the case of the present study, moral outrage). One area for future research would be to study the links between moral identity and the development of various moral emotions, and how these in turn lead to moral behavior.

Our selection of measures was based on use in previous relevant research. However, morality is multidimensional (Graham, Haidt, & Nosek, 2009; Haidt & Joseph, 2004) and future research should explore both explicit and implicit measures of moral identity that go beyond the unidimensional conception of morality inherent to the measures used in this study. Further, the use of parallel items in the explicit and implicit assessments would be an additional way to validate the findings of the present study and more definitively show dissociation between explicit and implicit moral identity assessments in predicting outcomes (e.g., Brunstein & Schmitt, 2004).

It should be noted that the findings reported in this paper cannot be assumed to generalize beyond the present sample. Canadians, and particularly Canadian university students, are generally quite liberal in their opinions on social welfare issues (e.g., health care and foreign aid issues referenced by the moral outrage inductions). Religious affiliations are also less common, and in many cases less strong, than in many other countries. Future research, therefore, should explore whether the relations observed in the present sample also exist in groups of individuals from more conservative and more religious cultures.

7.5. Conclusion

The results of this study underline the importance of distinguishing among the ways moral identity, moral emotion, and moral behavior are assessed. Implicit moral identity will be likely to predict spontaneous moral outcomes such as physiological emotionality in moral contexts; however, when reflective, explicit reports of moral emotions are in question, explicit reports of moral identity may be a stronger predictor. Moral identity appears to operate through dual processes similar to other aspects of social cognition, and future studies on moral identity should reflect this distinction with a consideration of how both implicit/impulsive...
and explicit/reflective processes contribute to moral cognitions and behavior.

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