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How social representations become automatic:

The measurement and impact of implicit norms

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## Abstract

We examine the impact of social representations on people's relatively automatic thoughts about social stimuli and characterize these thoughts as implicit norms. The purpose of the present research is to develop measures that tap into implicit norms using a modified version of implicit association test. Study 1a and 1b provide preliminary evidence of the convergent and discriminant validity of the implicit norms measure. Study 2 showed that among Asian immigrants to Canada implicit norms toward older people were predicted by length of time that immigrants had been in Canada, whereas implicit attitudes tended to be predicted by the strength of identification with Canadian culture, providing evidence of discriminant validity between implicit attitudes and norms. Study 3 demonstrated that implicit norms could be formed in the lab through the association of objects with consensually positive or negative stimuli. Finally, in Study 4 we showed that implicit norms predicted behaviors consistent with the norm for Asian-Canadians and behaviors in opposition to the norm for European-Canadians. The implications of these results for implicit processes and the influence of social representations on thought and behavior are discussed.

**KEY WORDS:** social representations; implicit processes; automatic behaviors

*The social condition, the religion, and the customs of the first immigrants undoubtedly exercised an immense influence on the destiny of their new country. Nevertheless, they could not found a state of things originating solely in themselves: no man can entirely shake off the influence of the past; and the settlers, intentionally or not, mingled habits and notions derived from their education and the traditions of their country with those habits and notions that were exclusively their own . . . The picture of American society has, if I may so speak, a surface covering of democracy, beneath which the old aristocratic colors sometimes peep out.*

*- de Tocqueville (1835, pp. 34-36)*

In this quote de Tocqueville makes an interesting claim. He suggests that although the Puritans who settled the Northeastern U.S. intentionally tried to form their own government and institutions that were distinct from the British society they fled, they were nevertheless influenced by their exposure to British social representations and this exposure shaped their thoughts and actions. But how does exposure to social representations shape our thoughts and actions? Is there an influence of social representations that resides outside of our awareness? If so, how would we measure such influence? This paper will attempt to begin to answer these questions.

According to Moscovici (2001), social representations form a framework for society to function. He argues:

the representation is a notion conceived to explain what, if anything, binds people together in a group, a society, and makes them act together. In order to bind themselves, create institutions, and follow common rules, people need a system of beliefs, common representations which are proper

to their culture (Moscovici, 2001, p. 21).

These networks of common knowledge or social representations become easily accessible and activated by environmental cues (Markus & Plaut, 2001). Furthermore, members of society develop cognitive styles that are appropriate in their society in order to understand and interpret their social realities (Philogène & Deaux, 2001).

Social representations also guide and regulate people's decisions (Philogène & Deaux, 2001) and behaviors by providing expectations and social rules. In this way, they function as norms (Cialdini & Trost, 1998). When social representations create expectations they provide what Cialdini, Reno, and Kallgren (1990) call descriptive norms or a sense of what most people in society do or believe.

The study of norms has a long history in social psychology. Early work by Sherif (1935) for example, examined how norms form in perception of an ambiguous stimulus. He found that people are easily influenced by and adopt the views of others. Since this work, numerous studies have demonstrated the powerful influences of norms in shaping behavior (Cialdini & Trost, 1998; Fishbein & Ajzen, 1974). For example, Cialdini, et al. (1990) varied the amount of litter in a number of environments making the area unlettered in some conditions and strewn with litter in the others. This change in the environment presumably manipulated the descriptive norms about whether people litter in the area. They found that such norms had a big influence on whether people littered a handbill they had been given and this was true especially when people's attention was drawn to the environment.

The previous literature on norms, however, has conceptualized and studied norms at the explicit level. That is, norms have been studied that people consciously recognize

and report. In this paper we examine what we are calling implicit norms. By implicit norms we mean representations that are formed through relatively spontaneous associations about how others evaluate social stimuli. These representations can be distinguished from implicit attitudes because they are representations about others views rather than representations about one's own views. They can be further distinguished from explicit norms in that they are presumably formed through spontaneous processes, whereas explicit norms are formed through relatively deliberate processes. As in previous research on implicit constructs (Fazio & Olson, 2003; Olson & Fazio, 2004) we will distinguish implicit norms from explicit norms by measuring implicit norms without people's awareness of what we are measuring, whereas explicit norms will be measured with people's full awareness of what we are measuring. We make no strong claims about whether the implicit norms themselves are outside of awareness. We think this may well be the case, but examining this issue is beyond the scope of the current analysis.

We argue that simply by living in a society people will experience repeated exposure to how people and objects are represented and treated. This exposure can occur through the media or through personal experience. Regardless of the exposure they will eventually form associations between how social groups and objects are generally regarded by most people in their society. Thus people will have relatively automatic associations between what most people like and objects and groups that are widely portrayed and treated positively by society and between what most people don't like and objects and groups that are widely portrayed and treated negatively by society. We will not try to distinguish between social representations and norms. Rather, we will treat these related constructs as pointing to the same underlying variable and attempt to

develop a new measure that captures this variable and demonstrates its utility in predicting behavior.

There have been a few attempts to measure constructs related to implicit norms (Lahlou, 2001; Silvana de Rosa, 2001); however, these attempts have largely been unsuccessful due to difficulties in measuring implicit constructs. In the present research we adapt the Implicit Association Test (IAT: Greenwald, McGhee Schwartz, 1998) in an attempt to overcome these difficulties.

### Implicit Association Test

The IAT is one of the most widely used implicit measures with established validity and reliability in many studies (e.g., Egloff & Schmukle, 2002; McConnell & Liabold, 2001). The IAT measures the strength of association between target objects (e.g., flower or insect) and evaluative attributes (e.g., pleasant or unpleasant) by having participants classify stimulus items to category labels. In the critical blocks, participants categorize exemplars of evaluative attributes (e.g., sunshine, party, or disaster) and target items (e.g., photos of flowers or insects) simultaneously. If participants have faster response latencies when flowers and pleasant items share the same response than when flowers and unpleasant items share the same response, then it is inferred that they have positive implicit attitude towards flowers.

Recently, Olson and Fazio (2004) demonstrated that the traditional IAT is influenced by “extrapersonal associations.” According to Olson and Fazio (2004), the traditional IAT measures not only personal associations, but also associations that people have acquired through socialization. To separate the personal associations from extrapersonal associations, Olson and Fazio (2004) modified two features of the

traditional IAT. First, based on the finding that the IAT is driven by category labels, rather than exemplars (De Houwer, 2001), they changed the category labels for evaluative objects from “pleasant” and “unpleasant” to “I like” and “I don’t like.” Second, they removed the error feedback because the presence of the error message indicates that there is a “correct” answer. They found that the personalized version of the IAT was correlated with explicit measures more strongly and predicted behaviors better than the traditional IAT.

### Measuring Implicit Norms with the IAT

We propose that “extrapersonal associations” may in part reflect implicit norms. We hypothesize that social representations build associations of what most people like or believe. To test this hypothesis, we created IATs that measure implicit norms by following Olson and Fazio’s methodologies. More specifically, we changed the category labels from “pleasant” and “unpleasant” to “most people like” and “most people don’t like.”

In Study 1, we establish the convergent validity and discriminant validity of implicit attitudes and implicit norms. We examine the domain of flowers vs. insects (Study 1a) and apples vs. candy bars (Study 1b) because these domains are often used in IAT research (e.g., Greenwald et al., 1998; Karpinski & Hilton, 2001; Olson & Fazio, 2004). In Study 2, we establish the discriminant validity of implicit attitudes and implicit norms by demonstrating that these two constructs are predicted by different aspects of acculturation among Asian-Canadians. In Study 3, we experimentally manipulate implicit norms in the lab. Finally, in Study 4, we investigate how implicit attitudes and implicit norms predict behavior.

## Study 1a

### *Method*

#### *Participants*

Seventy-three undergraduate students (28 men and 45 women) participated in the experiment for credit towards their introductory psychology course. All participants were native speakers of English.

#### *Materials*

*The traditional IAT.* Following the methodology of Greenwald et al. (1998), the IAT had five blocks in total. We used five photos of flowers (carnation, daisy, lily, rose and tulip) and insects (ant, cockroach, maggot, fly and wasp) for stimulus items (Greenwald et al., 1998; Karpinski & Hilton, 2001). The first block was a practice trial for pleasant and unpleasant items, and participants classified pleasant (e.g., friend, party, gift) and unpleasant stimulus items (e.g., disaster, evil, death) to the category labels “pleasant” and “unpleasant.” The second block and fourth block were practice trials for flower and insect items in which participants categorized photos of flowers and insects to the labels “flower” and “insect” by pressing the response keys. The third block was an incompatible critical block in which flowers and unpleasant items share the same response key and insects and pleasant items share the same response key. The fifth block was a compatible critical block, in which flowers and pleasant items shared the same response key and insects and unpleasant items shared the same response key.<sup>1</sup>

*The implicit attitudes measure.* The implicit attitudes measure (i.e., association of flowers vs. insects with what I like) was the same as the traditional IAT except that participants were asked to distinguish between “things you might like or dislike” using



the category labels “I like” and “I don’t like” (Olson & Fazio, 2004).

*The implicit norms measure.* The implicit norms measure (i.e., association of flowers vs. insects with what most people like) was also similar to the traditional IAT except participants were asked to distinguish between things most people like or dislike using the category labels “most people like” and “most people don’t like.” Specifically, we changed the instructions to say, “the following screens will ask you to distinguish between things most people like or dislike. The words most people like refer to what people in North America actually like, not what they should like.”

We also removed error messages from all three types of implicit measures because labeling responses as errors on the measure of implicit attitudes seemed inappropriate (for example, someone—perhaps Oscar the grouch—might actually like garbage) and we wanted to keep the format the same for all three measures. Thus, the three IATs were identical except for the category labels and instructions.

### *Procedure*

Participants were invited to the lab in groups of up to four at a time. They practiced the traditional flower-insect IAT to become familiar with completing an IAT. Starting one week after the lab session, participants completed the traditional IAT, the implicit attitudes measure and implicit norms measure over the internet with each version spaced from 0 to 28 days apart<sup>2</sup>. The average days between the measures are 7.93 days. The order of the measures was counterbalanced.

### *Results*

Following Jordan, Spencer, and Zanna (2005), response latencies that were slower than 3,000 ms were recorded as 3,000 ms and responses that were faster than 300 ms

were recorded as 300 ms. The scores were obtained by subtracting the average response latencies of the fifth block from those of the third block. Higher scores indicated relatively more positive evaluations of flowers than insects. We found no differences for the number of days between IAT administrations so we did not analyze for this variable. We analyzed data using a 3 (implicit measure: implicit attitudes measure, implicit norms measure, traditional IAT) x 2 (gender) mixed model ANOVA, with implicit measure as a within-participants factor and gender as a between-participants factor. Neither the main effect for implicit measure nor the main effect for gender was significant,  $F_s < 1$ . However, there was a significant interaction between implicit measure and gender,  $F_{(2, 132)} = 3.99, p = .02$ . Follow up analyses indicated that there was a marginal gender difference on the implicit attitudes measure, ( $\underline{M}_{(\text{males})} = 164.5, \underline{M}_{(\text{females})} = 229.4; F_{(1, 132)} = 3.34, p = .07$ ), but no gender differences on the traditional IAT ( $\underline{M}_{(\text{males})} = 205.7, \underline{M}_{(\text{females})} = 174.7$ ) or the implicit norms measure ( $\underline{M}_{(\text{males})} = 226.7, \underline{M}_{(\text{females})} = 187.9$ ), both  $F_s < 1$ . On the implicit attitudes measure, women showed a tendency to have a stronger personal preference for flowers than insects.

We also examined the relations among the traditional IAT, implicit attitudes measure and the implicit norms measure. The implicit attitudes measure and implicit norms measure were significantly correlated with the traditional IAT,  $r = .38, p < .01, r = .34, p < .01$ , respectively. Moreover, we also found that the implicit attitudes measure and the implicit norms measure were significantly correlated,  $r = .41, p < .01$ . To investigate the unique contributions of the implicit attitudes measure and the implicit norms measure on the traditional IAT, we conducted a multiple regression analysis in which the implicit attitudes measure and the implicit norms measure were entered together as predictor

variables. As Figure 1 shows, the implicit attitudes measure accounted for significant variance and the implicit norms measure accounted for marginally significant variance in the traditional IAT,  $\beta = .28$ ,  $t_{(68)} = 2.36$   $p = .02$ ,  $\beta = .22$ ,  $t_{(68)} = 1.86$   $p = .07$ , respectively.

### *Discussion*

In Study 1a, we found that the implicit attitudes measure and implicit norms measure have a moderate correlation and independently predict the traditional IAT. Thus, they appear to be unique constructs. Interestingly, on the measure of implicit attitudes female participants tended to show stronger preferences for flowers over insects than male participants. No such preference was found on the traditional IAT or the implicit norms measure. One might expect that given predominant gender roles in society women might have more positive implicit attitudes toward flowers (and perhaps more negative implicit attitudes toward insects) than men. The results on the implicit attitudes measure were consistent with this expectation. In contrast, when considering cultural norms (presumably influenced by the views of both men and women) one might not expect a gender difference. Although not definitive, this finding is consistent with our reasoning about implicit attitudes vs. implicit norms –and supports their discriminant validity.

### *Study 1b*

Study 1a provided convergent validity between our implicit norms measure and both implicit attitudes and the traditional IAT; however, because these measures were positively correlated with each other, it was not clear how these constructs are different. Therefore, the purpose of Study 1b is to replicate the finding of Study 1a in a different domain attempting to investigate the discriminant validity between implicit norms and

implicit attitudes. We chose the domain of apples and candy because it has widely been used in previous research.

### *Method*

#### *Participants*

The same 73 participants who completed Study 1a completed Study 1b.

#### *Materials*

We used the same traditional IAT, implicit attitudes measure and implicit norms measure as in the Study 1a except for stimulus items and category labels. More specifically, participants categorized photos of apples and candy bars with category labels “apple” and “candy bar.” The IAT was coded so that higher scores indicated more positive evaluations towards apples than candy bars.

#### *Procedure*

The procedure of Study 1b was the same as in Study 1a, except for the change in the materials described above.

### *Results*

We used the same algorithm to calculate IAT scores as in Study 1a. We conducted a 3 (implicit measure: implicit attitudes measure, implicit norms measure, traditional IAT) x 2 (gender) ANOVA, with repeated measures on the first factor. No significant main effects for implicit measure or gender and no interaction between implicit measure and gender emerged,  $F_s < 1$  ( $M = -21.7$ ,  $SD = 130.1$  for the implicit attitudes measure,  $M = -23.1$ ,  $SD = 133.3$  for the implicit norms measure,  $M = -27.0$ ,  $SD = 179.7$  for the traditional IAT).

Replicating Study 1a, the implicit attitudes measure and implicit norms measure were significantly correlated with the traditional IAT,  $r = .45, p < .01$ ,  $r = .28, p < .05$ , respectively. Moreover, the implicit attitudes measure and implicit norms measure were not correlated with each other,  $r = .15$  *ns*. As Figure 2 shows, multiple regression analysis provided stronger evidence of the unique influence of the personalized and cultural norm IAT on the traditional IAT,  $\beta = .42, t_{(65)} = 3.81, p < .01$ ,  $\beta = .22, t_{(65)} = 1.99, p = .05$ , respectively.

### *Discussion*

These results provide additional evidence of convergent validity of implicit norms with scores on the traditional IAT and evidence of discriminant validity between implicit norms and implicit attitudes. Replicating Study 1a, Study 1b provided evidence that the traditional IAT seemed to be influenced by both implicit attitudes and cultural norms. Moreover, there was a disassociation between implicit attitudes and implicit norms towards apples vs. candy bars, suggesting that people's implicit attitudes and implicit norms are not consistent with each other in this domain. Taken together, Study 1a and Study 1b demonstrated that implicit attitudes and implicit cultural norms appeared to be unique constructs in that they uniquely predict scores on a traditional IAT<sup>3</sup>. In Study 2, we examine how exposure to a new culture can shape implicit attitudes and implicit norms and suggest that different types of acculturation will shape implicit attitudes and implicit norms differently.

### *Study 2*

In Study 2, we examine people's implicit norms and implicit attitudes toward older people. According to Sung (2001), traditional East Asian cultures have been

influenced by Confucian values, which emphasize obedience and respect for parents and older people. In contrast, negative attitudes or prejudices against older people are prevalent in Western cultures (Nelson, 2005). Therefore, in East Asian cultures, we expect there to be more positive norms towards older people than in Western cultures.

When people are exposed to a new culture we expect that implicit norms and implicit attitudes will form in response to different aspects of that exposure. We expect that implicit norms will be formed by being exposed to what other people like and don't like, whereas implicit attitudes will be formed by identification with the new culture. Thus in this case if people are exposed to elderly people being viewed and treated negatively, then they will come to associate elderly people with what most people don't value. Based on this reasoning, we expected that the longer Asian-Canadians have lived in Canadian society the more negative their implicit norms will become, but implicit norms will not be affected by identification with Canadian culture.

In contrast, implicit attitudes are more likely to be idiosyncratic in their origin. One factor that may influence implicit attitudes is identification with the new culture to which people are immigrating. If they highly identify with that culture they may actively try to take on the views commonly held in that culture. In this way, Asian-Canadians who highly identify with being Canadian may actively try to take on the negative views of Canadian society and therefore be more likely to develop negative implicit attitudes about older people, but implicit attitudes will be unaffected by the length of time that people have lived in Canadian society.

### *Method*

#### *Participants*

Eighty-five European-Canadian (23 men and 62 women) and 151 Asian-Canadian (51 from Hong Kong, 50 from China, 7 from Taiwan, 2 from South Korea, 2 from Malaysia, 1 from North Korea, 1 from Vietnam and 37 did not provide information on their country of origin) (56 men and 95 women) undergraduate students from the University of Waterloo participated in this study for course credit or an \$8.00 payment.

### *Materials*

*Acculturation measures.* To measure the level of acculturation for Asian-Canadian participants, we asked them to indicate the strength of identification with Asian culture and Canadian culture on an 11-point Likert scale ranging from 0 (not at all) to 10 (very much). We also assessed the length of time they had spent in Canada.<sup>4</sup>

*Explicit attitudes towards younger and older people.* Participants were asked to indicate their attitudes towards younger and older people on 7-point semantic differential scales: favorable – unfavorable, positive – negative, like – dislike, and desirable – undesirable.

*Explicit norms about younger and older people.* To measure explicit norms towards younger and older people, we asked participants to indicate most people's overall opinions or evaluations of younger people or older people on the same semantic differential scales as attitudes measures.

*Implicit attitudes towards younger and older people.* We used the same implicit attitudes measure as in Study 1 except for the category labels and stimulus items. To capture participants' implicit attitudes towards younger and older people, we used the implicit attitudes measure with category labels, "I believe in" and "I don't believe in." We chose ideological exemplars, such as sadness, hate, dishonesty, oppression, injustice,

happiness, love, honesty, freedom, and justice. The other category labels were “young” and “old” and participants were asked to categorize photos of younger men and women and older men and women. All the pictures were of European-Canadians.

*Implicit norms about younger and older people.* The implicit norms measure was the same as the implicit attitudes measure except the category labels “I believe in” and “I don't believe in” were replaced with the category labels “most people believe in,” and “most people don't believe in.”

#### *Procedure*

Participants completed the implicit attitudes measure and implicit norms measure and corresponding explicit measures over the internet. Each IAT was separated from three days to 26 days apart (with an average of 6.39 days apart) to reduce carryover effects. The order of the set of measures was counterbalanced.

#### *Results and Discussion*

*Acculturation measures.* We measured the length of time that Asian-Canadians had lived in Canada and the mean length of time was 8.76 years ( $SD = 5.16$ ). In the following analyses the length of time in Canada was log transformed because we felt that differences in time spent in Canada were more likely to be potent when time in Canada was relatively short than when it was relatively long (i.e., the difference between 1 year vs. 2 years in Canada would be more pronounced than the difference between 15 years and 16 years). The log transformation corrects for this difference. We also measured identification with Canadian culture and identification with Asian culture. The mean strength of identification with Canadian culture was 6.97 ( $SD = 2.01$ ), whereas the mean



identification with Asian culture was 8.37 ( $SD = 1.76$ ). The length of time spent in Canada and Canadian identity were modestly correlated with each other,  $r = .19, p < .05$ .

*Acculturation and implicit norms.* We used the same algorithm to calculate IAT scores as in Study 1. Higher scores on the both the implicit norms and implicit attitudes indicate more positive implicit norms and attitudes toward the elderly.

Recall we predicted that when Asian-Canadians first moved to Canada they would have more positive implicit norms about older people than European-Canadians but this difference would diminish the longer Asian-Canadians lived in Canada. To test this reasoning, we conducted a regression analysis in which log-transformed length of time spent in Canada predicted implicit norms after controlling for identification with Canadian culture, identification with Asian culture, explicit attitudes, explicit norms, and implicit attitudes toward older people. We found that log-transformed length of time spent in Canada predicted implicit norms,  $\beta = -.20, t_{(98)} = -2.13, p < .05$  above and beyond the control variables. In addition, implicit attitudes and explicit attitudes also predicted implicit norms,  $\beta = .32, t_{(98)} = 3.43, p = .001$ , and  $\beta = .20, t_{(98)} = 1.86, p = .07$  respectively, all other  $\beta$ s  $< .05, ts < 1$ .

Thus, as can be seen in Figure 3, implicit norms are predicted by the log of time spent in Canada, but are not predicted by identification with Canadian culture. Asian-Canadians who had spent more time in Canada had more negative implicit norms than Asian Canadians who had recently come to Canada. Although it is difficult to assess the statistical difference between predicted means and actual means, when Asian-Canadians first come to Canada (i.e., at 1 *S.D.* below the mean or 3.49 years in Canada) their predicted mean for implicit norms ( $M_{\text{pred}} = -48.9$ ) tended to be more positive than that of

European-Canadians' ( $M = -104.7$ ). However, when Asian-Canadians have been in Canada longer (i.e., at 1 *S.D.* above the mean or 15.64 years in Canada) their predicted mean ( $M_{\text{pred}} = -124.8$ ) for implicit norms toward the elderly was if anything more negative than European-Canadians' ( $M = -104.7$ ).

*Acculturation and implicit attitudes.* We also examined implicit attitudes to see if they showed the same pattern of relation between the acculturation variables as implicit norms. We conducted a regression analysis in which log-transformed length of time spent in Canada predicted implicit attitudes and identification with Canadian culture, identification with Asian culture, and explicit attitudes, explicit norms, and implicit norms toward the elderly were included as control variables in the analysis. Log transformed length of time in Canada was not a significant predictor of implicit attitudes  $\beta = -.03, t < 1$ . Implicit attitudes were predicted, however, by implicit norms,  $\beta = .34, t_{(98)} = 3.43, p = .001$ , and identification with Canadian culture,  $\beta = -.17, t_{(98)} = -1.80, p = .08$ .

Thus, as can be seen in Figure 4, implicit attitudes tend to be predicted by identification with Canadian culture, but are not predicted by the log of time spent in Canada. Asian-Canadian immigrants who were more strongly identified with Canadian culture tended to have implicit attitudes that were more negative toward the elderly than Asian-Canadian immigrants who were less identified with Canadian culture. Both these groups, however, had implicit attitudes toward the elderly that tended to be more positive than European-Canadians. Asian-Canadians who were strongly identified with Canadian culture (i.e., who were 1 *S.D.* above the mean) had a predicted mean of ( $M_{\text{pred}} = -102.43$ ), Asian-Canadians who were weakly identified with Canadian culture (i.e., who were 1 *SD*

below the mean) had a predicted mean of ( $M_{\text{pred}} = -35.0$ ), whereas European-Canadians had a mean of ( $M = -184.5$ ).

*Explicit attitudes and explicit norms.* We combined the questions about explicit attitudes toward older people (Cronbach's alpha = .88 for younger people, Cronbach's alpha = .90 for older people) and explicit norms (Cronbach's alpha = .80 for younger people, Cronbach's alpha = .89 for older people) each into a single index. Then, we subtracted the combined measure for younger people from that of older people—as was done in the IAT measures of these constructs; therefore, higher values indicate more positive evaluations towards older people than towards younger people. These two variables were highly correlated,  $r = .48$ ,  $p < .05$ .

In regression analyses we predicted both these variables from each other and log transformed time spent in Canada, identification with Canadian culture, identification with Asian culture, implicit attitudes, and implicit norms. Explicit attitudes were only predicted from explicit norms,  $\beta = .51$ ,  $t_{(98)} = 5.92$ ,  $p < .001$ , and implicit norms,  $\beta = .17$ ,  $t_{(98)} = 1.86$ ,  $p = .07$ , whereas explicit norms were only predicted by explicit attitudes,  $\beta = .52$ ,  $t_{(98)} = 5.92$ ,  $p < .001$ . Thus, the measures of acculturation had no affect on explicit attitudes or explicit norms,  $ts < 1$ .

In summary, Study 2 showed that although implicit attitudes and implicit norms are related, among immigrants they are predicted by different measures of acculturation. Implicit norms are predicted by the amount of time that immigrants have spent in the country to which they have immigrated. In contrast, implicit attitudes are predicted, albeit marginally, by identification with the culture to which they have immigrated. These relations are obtained when controlling for explicit attitudes, explicit cultural norms, and

the other implicit construct. These results suggest that although implicit attitudes and implicit cultural norms are related, they are different constructs. However, because of the correlational nature of the study, we cannot determine that exposure to Canadian culture caused changes in implicit cultural norms—perhaps the types of immigrants who came when they were younger as opposed to older are different. Therefore in Study 3, we experimentally manipulate the association between an object and consensually positive or negative stimuli to see whether such exposure can create implicit cultural norms.

### Study 3

The goal of Study 3 is therefore to examine the formation of implicit norms more directly using the evaluative conditioning paradigm that Olson and Fazio (2001, 2002) developed. Past research on evaluative conditioning revealed that attitudes towards a novel object (conditioned stimulus, CS) develop through repeated exposure to the object when it is paired with positive or negative stimuli (unconditioned stimuli, US) (see De Houwer, Thomas & Baeyens, 2001 for review; Levey & Martin, 1975; Olson & Fazio, 2001; Razran, 1954). Although some of the earlier studies on conditioning (e.g., Razran, 1954; Zanna, Kiesler & Pilkonis, 1970) used biologically-based US (e.g., food, aversive odor or electric shock), in more recent evaluative conditioning paradigms (e.g., Olson & Fazio, 2001) US are typically less biologically based but rather based on stimuli that are consensually viewed as positive or negative. From our perspective, these consensually positive and negative stimuli are cultural representations of what most people like and do not like. Evaluative conditioning using such stimuli should thus promote associations between what most people like and do not like and specific objects (i.e., they should create implicit descriptive norms about the object).

Given that people actually like and dislike the objects used in these tasks it is not surprising that such evaluative conditioning paradigms affect implicit attitudes, but we expect that they will have at least as strong of an effect on—if not a stronger effect on—implicit cultural norms. Specifically, we hypothesize that when US are representations of what most people like or dislike evaluative conditioning can create implicit cultural norms. In Study 3, we test this hypothesis by exposing participants to novel characters that are paired with normatively positive or negative stimuli.

### *Method*

#### *Participants*

One hundred and fourteen (69 White, 25 Asian, 11 South Asian, 3 Middle Eastern, 2 African descendent, 1 Hispanic, 1 didn't provide her ethnic background and 2 indicated that their races didn't fit into these categories) University of Waterloo undergraduate female students participated in the study in exchange for a course credit or an \$8.00 payment. Of these, one participant was excluded from data analyses because she was suspicious.

#### *Materials*

*Stimuli for the conditioning tasks.* For unconditioned stimuli, we adopted the positive and negative words and images used by Olson and Fazio (2002). CS consisted of six pictures of two novel characters. These characters were created to look somewhat like the Pokemon characters used in Olson and Fazio (2002), but we created new characters rather than using preexisting characters to make certain that people did not have any preexisting attitudes or norms about the characters. We also used the same neutral filler words and images as Olson and Fazio (2002).

*Implicit attitudes towards characters.* To measure implicit attitudes, we used the same implicit attitudes measure as in Study 1 with the exception of category labels and stimulus items. Participants were asked to categorize pictures of the two novel characters. The other category labels were “I like” and “I don’t like” and the stimulus items were the same as in Study 1.

*Implicit norms towards characters.* The implicit norms measure was the same as the implicit attitudes measure except that the category labels were “most people like” and “most people don’t like.”

### *Procedure*

Following Olson and Fazio’s methodology (2002), an experimenter explained to participants that the study was about “attention and rapid responses” and that their task was to “play the role of a security guard, watching for deviant activity at a place of business.” Participants were asked to press a response button as quickly as they could whenever they saw the images or names of targets on a computer screen over the course of five blocks. The targets consisted of Pokemon-like characters, and participants were provided with the names and pictures of characters on paper in the beginning of the experiment. A different target was assigned to each block, which randomly appeared 10 times sometimes alone and sometimes paired with filler items.

Participants were exposed to eight CS-US pairs in each of five blocks, with one novel character (“Sheeter”) being always paired with positive stimuli and the other (“Toreny”) always paired with negative stimuli. A blank screen was presented before and after the CS-US pairs. Filler images and words consisted of neutral images, words, and other Pokemon characters and were presented sometimes alone and sometimes with pairs.

Sixteen blank screens were included to reduce rhythmic presentation of items. There were 86 trials in each block, and each stimulus item was presented for 1.5 seconds.

In the control condition, the CS were presented in a blank background without being paired with the US. Participants were randomly assigned to either the experimental or control condition. Immediately after the conditioning phase, participants randomly completed either the implicit attitudes measure or implicit norms measure.

### *Results*

We used the same algorithm to calculate IAT scores as in Study 1. Higher scores on the implicit measure indicate more positive implicit attitudes or norms towards the character that was paired with positive US than the one paired with negative US. To reduce the influence of outliers, we excluded the scores that had greater than 20% of error rates and were three standard deviations away from the means (Nosek, Greenwald & Banaji, 2005)<sup>5</sup>. A 2 (Condition: experimental vs. control) x 2 (implicit measure: implicit norms vs. implicit attitudes) between-participant ANOVA revealed a significant interaction,  $F_{(1, 87)} = 5.18, p < .03$ . As can be seen in Table 1, the follow-up analyses revealed that participants in the experimental condition had more positive implicit norms than implicit attitudes towards the character that was paired with consensually positive information than with the character paired with consensually negative information ( $M_s = 114.07$  and  $-5.22$ , respectively;  $SD_s = 142.11$  and  $121.39$ ),  $F_{(1, 87)} = 12.15, p < .005$ . In addition, participants had marginally more positive implicit norms in the experimental condition compared to the control condition ( $M_s = 114.07$  and  $49.64$ , respectively;  $SD_s = 142.11$  and  $87.52$ ),  $F_{(1, 87)} = 3.46, p = .06$ . However, participants did not have more

positive implicit attitudes in the experimental condition compared to the control condition ( $M_s = -5.22$  and  $40.09$ , respectively;  $SD_s = 121.39$  and  $99.78$ ,  $F_{(1, 87)} = 1.82$ ,  $p > .15$ ).

### *Discussion*

Consistent with our hypothesis, participants developed more positive implicit norms towards the character that was paired with consensually positive US than the character that was paired with consensually negative US. This finding suggests that implicit norms can be created by the association between objects and consensually positive and negative stimuli.

Surprisingly, we did not replicate the previous findings obtained by Olson and Fazio (2001, 2002) that evaluative conditioning can affect implicit attitudes. Despite this lack of replication we do not believe that the current findings call into question the previous results. In fact, if we include the results of this study as simply another test of the hypothesis that evaluative conditioning can affect implicit attitudes and combine the present results with the previous tests (Olson & Fazio, 2001; Olson & Fazio, 2002) in a meta-analysis, then the effect of evaluative conditioning on implicit attitudes still appears to be reliable  $z = 2.64$ ,  $p < .01$ .

What the results might suggest, however, is that forming implicit norms by using consensually positive and negative stimuli might affect implicit norms more potently than implicit attitudes. Although beyond the scope of the present analysis it seems plausible that consensually positive and negative stimuli might create implicit norms more easily than implicit attitudes, whereas idiosyncratically positive and negative stimuli might create implicit attitudes more easily than implicit norms. In any event, the present study provides further evidence that implicit norms and implicit attitudes are not the same



construct as only the former and not the latter was affected by the evaluative conditioning in this study.

#### Study 4

Our studies thus far provided evidence that implicit attitudes and implicit norms are two distinct constructs. In Study 4, we aim to investigate how implicit attitudes and implicit norms will predict behaviors for Asian-Canadians and European-Canadians. According to the theory of reasoned action (Fishbein & Ajzen, 1974), behavior and behavioral intentions are predicted by both attitudes and subjective norms. Subjective norms are defined as perceived approval or disapproval from important others for engaging in particular behaviors (Fishbein & Ajzen, 1974). It thus seems that subjective norms are similar to injunctive norms (i.e., norms about what people should do, Cialdini, et al., 1990). Thus in the present study we modified our measure of implicit norms to capture the injunctive aspects of norms. Specifically we used the category labels, “people approve of,” and “people disapprove of.”<sup>6</sup>

Research on the theory of reasoned action and self-construal has shown that attitudes tend to be a stronger predictor of behavioral intention among people who have independent self-construals than those with interdependent self-construals. In contrast, subjective norms tend to be a stronger predictor of behavioral intentions among people who have interdependent self-construals than those with independent self-construals (Trafimow & Finlay, 1996).

These findings suggest that culture may affect the relative importance of attitudes vs. norms in predicting behavior. According to theorizing and research by Markus and Kitayama (1991, 1994) the self-construal of people from individualist cultures tends to be

organized as autonomous and unique. Therefore, internal attributes, such as their goals, values or attitudes have a stronger influence in guiding behaviors among those who are in individualist cultures than those who are in collectivist cultures (Fiske et al., 1998; Lehman, Chiu & Schaller, 2004; Markus & Kitayama, 1994).

In contrast, the self-construal of people from collectivist cultures tends to be organized around relationships with others. Therefore, people in collectivist cultures are sensitive to other people's goals and needs (Markus & Kitayama, 1991; Markus & Kitayama, 1994; Triandis, 1989). As a result, social roles, expectation or cultural norms are more likely to guide and regulate behaviors among those in collectivist cultures than those in individualist cultures (Fiske et al., 1998; Lehman, Chiu & Schaller, 2004; Markus & Kitayama, 1994). Given this reasoning, we hypothesized that attitudes will have a stronger influence on behavior among European-Canadians than Asian-Canadians, whereas cultural norms will have a stronger influence on behavior among Asian-Canadians than European-Canadians.

Moreover, we predicted that this pattern will most strongly emerge at the implicit level when one's cognitive resources are limited. According to Fazio's MODE model (Fazio & Towles-Schwein, 1999; Schuette & Fazio, 1995), when people do not have motivation or opportunity to control their behavior, implicit processes will have primary control over behavior.

In this study, we examined European-Canadians and Asian-Canadians' eating behavior when they have limited cognitive resources to control their behavior. One of the ways to limit people's capacity for self-regulation is through ego-depletion. The strength model of self-regulation (Muraven, Tice & Baumeister, 1998) argues that ability for self-

regulation draws on limited resources and will become fatigued in a similar way as a muscle.

Consistent with this reasoning, Hofmann, Rauch and Gawronski (2007) found that when Europeans were ego-depleted by an emotion suppression task, implicit attitudes predicted the amount of candy that participants consumed. In contrast, when cognitive resource for self-control was high, their explicit dietary restraint standards predicted the behaviors. Because our focus was on implicit norms all our participants were ego-depleted. Therefore, we hypothesized implicit attitudes would predict behavior more strongly for European-Canadians than Asian-Canadians, and implicit norms would predict behavior more strongly among Asian-Canadians than European-Canadians.

### *Method*

#### *Participants*

Thirty-two European-Canadian and 39 Asian-Canadian undergraduate students (26 men and 45 women) from the University of Waterloo participated in the study for course credit or an \$8.00 payment. The Asian-Canadians were born in East Asian countries (e.g., China, Hong Kong, Taiwan). In addition, at the beginning of the term potential participants filled out a cultural background questionnaire at a mass testing session that included questions about cultural identity. Specifically, we asked how much participants identify with their culture of origin and how much they identify with Canadian culture on an 11-point Likert scale ranging from 0 (not at all) to 10 (very much). We recruited Asian-Canadians whose identification with Asian cultures was 8 or above<sup>7</sup> and whose identification with Canadian culture was 6 or below.

Among Asian-Canadian participants, the mean strength of identification with Asian culture was 8.96 ( $SD = 1.02$ ), the mean strength of identification with Canadian culture was 4.04 ( $SD = 1.74$ ) and the mean length of time spent in Canada was 6.63 ( $SD = 4.3$ ) years.

### *Materials*

*Explicit attitudes towards chips and vegetables.* Participants were asked to indicate their attitudes towards chips and vegetables on 7-point semantic differential scales: favorable - unfavorable, positive - negative, like - dislike, healthy - unhealthy, good for you - bad for you, tastes good - tastes bad, and tasty - bland. They also indicated their agreement or disagreement to the statements, “I like eating chips,” and “I like eating vegetables,” on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

*Explicit norms about chips and vegetables.* Participants were asked to indicate the extent to which they agree or disagree with the statements, “Most people who are important to me think I should eat vegetables,” and “Most people who are important to me think I should eat chips,” “Most people approve of eating vegetables,” and “Most people approve of eating chips,” on a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

*Implicit attitudes towards chips and vegetables.* To measure participants’ implicit attitudes towards chips and vegetables, we used the same implicit attitudes measure as in Study 1 except for the category labels and stimulus items. The new category labels were “vegetables” and “chips” and we used photos of chips (Humpty Dumpty Ripples, Lay’s, Munchos, Ruffles, and Humpty Dumpty Regular) and vegetables (carrots, green peppers,

broccoli, celery, and cauliflower) as exemplars of this category.

*Implicit norms about chips and vegetables.* We measured participants' implicit norms about chips and vegetables using the same implicit norms measure as in Study 1. The exemplars were behaviors about which we reasoned almost all people would approve or disapprove (i.e., cheating, abusing, murdering, exercising, helping and sharing). To capture injunctive aspect of cultural norms, we used category labels "people approve of" and "people disapprove of." We used the same stimulus items and category labels for chips and vegetables as in the implicit attitudes measure.

#### *Procedure*

Participants completed either the implicit attitudes measure or the implicit norms measure and corresponding explicit measures over the internet. Between 0 and 13 days later they completed the other set of measures<sup>8</sup>. The average days between the measures were 6.16 days. The order of which set of measures they completed first was determined randomly. Once participants completed the implicit and explicit measures over the internet, they were individually invited to the lab.

In the lab session, the participants were asked to type meaningless letters, numbers, and symbols on a computer ostensibly "to investigate the relationship between hand strength and typing speed." After the bogus typing task, participants were asked to squeeze a (gender-appropriate) handgrip as long as they could. The experimenter timed until participants became too tired to squeeze the handgrip. They squeezed the handgrip four times, twice for each hand. The handgrip exercise should have caused ego-depletion among the participants (Muraven, Tice & Baumeister, 1998).

Immediately after the handgrip exercise, participants were brought to an adjacent

room for supposedly unrelated “marketing research.” They were asked to evaluate three new dips and were provided with chips and vegetables to allow them to taste the dips. The amount of chips and vegetables that participants consumed in the lab was measured by weighing the chips and vegetables before and after participants tested the dips. Participants were thanked and fully debriefed.

### *Results and Discussion*

We measured the amount of chips and vegetables eaten by calculating the proportion of chips or vegetables consumed in relation to the amount of chips or vegetables that were available to be consumed. Specifically, we divided the weight of chips or vegetables that participants consumed by the initial weight of chips or vegetables before the experimental session. We calculated this proportion measure because it allowed chips and vegetables to be on a similar metric. We then subtracted the proportion of chips that were eaten from the proportion of vegetables that were eaten. Therefore, higher values indicate that participants consumed more vegetables than chips.

*Implicit measures.* We used the same algorithm to calculate the scores as in Study 1. Higher scores on the measures indicate more positive implicit attitudes or norms towards vegetables than chips. The number of days between the measures was not related to either implicit measure, so we did not analyze for this variable. Our measures of implicit attitudes and implicit norms were moderately correlated for European-Canadians,  $r = .34, p < .01$ , but were uncorrelated for Asian-Canadians,  $r = .01, p > .5$ .

*Predicting eating behavior.* To test our hypothesis regarding cross-cultural differences in the influence of implicit attitudes and implicit norms on eating behavior, we conducted a hierarchical multiple regression analysis. First, we centered implicit

attitudes and implicit norms and created interaction terms between these implicit constructs and cultural of origin (Aiken & West, 1991). Then, we entered culture of origin (dummy coded as European-Canadians = 0, Asian-Canadians = 1), implicit attitudes and implicit norms, explicit attitudes and norms, and all combinations of two-way interactions between these variables in a multiple regression predicting the relative amount of chips and vegetables eaten. The results showed a significant main effect for implicit attitudes ( $\beta = .37$ ,  $t_{(58)} = 2.96$ ,  $p < .01$ ), a significant two-way interaction between culture of origin and implicit attitudes ( $\beta = -.45$ ,  $t_{(58)} = -2.31$ ,  $p < .05$ ), a significant two-way interaction between culture of origin and implicit norms ( $\beta = .45$ ,  $t_{(58)} = 2.89$ ,  $p < .01$ ), and a significant two-way interaction between culture of origin and explicit norms ( $\beta = .33$ ,  $t_{(58)} = 2.10$ ,  $p < .05$ ). No other main effects or interactions were significant ( $\beta$ s  $< .11$ ,  $t$ s  $< .95$ ,  $p$ s  $> .34$ ). We examine each of the significant two-way interactions below.

*The interaction of culture and implicit attitudes in predicting eating behavior.* As shown in Figure 5, implicit attitudes predicted behavior marginally for Asian-Canadians and significantly for European-Canadians, simple slopes,  $\beta = .24$   $t_{(58)} = 1.78$ ,  $p = .08$ , and  $\beta = .80$   $t_{(58)} = 4.02$ ,  $p < .001$ , respectively. The interaction between culture of origin and implicit attitudes, however, suggests that implicit attitudes are a stronger predictor for European-Canadians than for Asian-Canadians.

*The interaction of culture and implicit norms in predicting eating behavior.* As shown in Figure 6, implicit norms predicted behavior in opposite ways for Asian-Canadians and European-Canadians. Among Asian-Canadians, the stronger their implicit norms for eating vegetables were, the more vegetables relative to chips they ate,  $\beta = .31$ ,  $t_{(58)} = 2.02$ ,  $p < .05$ . In contrast, for European-Canadians, the stronger their implicit norms

for eating vegetables were, the less vegetables relative to chips they tended to eat,  $\beta = -.34$   $t_{(58)} = -2.06$ ,  $p < .05$ . This somewhat surprising finding suggests that European-Canadians may not conform to their implicit norms, but should be interpreted with caution given that it was not predicted and has not yet been replicated. What is clear, however, is that implicit norms predict behavior in different directions, positively for Asian-Canadians and negatively for European-Canadians.

*The interaction of culture and explicit norms in predicting eating behavior.*

Among Asian-Canadians explicit norms were a significant predictor of eating behavior  $\beta = .40$   $t_{(58)} = 2.65$ ,  $p < .05$  ( $M_{\text{pred}} = -1.34$ ;  $M_{\text{pred}} = 1.35$  at -1 SD and +1 SD respectively), whereas among European-Canadians they were not  $\beta = -.06$   $t_{(58)} = -.35$ , *n.s.* ( $M_{\text{pred}} = 0.19$ ;  $M_{\text{pred}} = -0.18$  at -1 SD and +1 SD respectively). Thus, at the explicit level norms were also a stronger predictor of behavior for Asian-Canadians than they were for European-Canadians. Despite implicit attitudes, implicit norms, and explicit norms predicting behavior for Asian-Canadians in a similar direction, it is important to remember that each of these variables is predicting behavior independently while controlling for the other variables and their interactions with culture, suggesting that they are independent constructs.

Interestingly, among European-Canadians these three variables predict behavior in very different ways. Implicit attitudes predict behavior consistent with these attitudes, implicit norms predict behavior in opposition to these norms, and explicit norms show no relation to behavior. Thus among European-Canadians it is clear that these three variables are quite distinct and affect behavior in very different ways. Together these results provide strong evidence for the divergent validity of implicit norms from implicit



attitudes and explicit norms.

This pattern of results is consistent with the cross-cultural differences in independent and interdependent self-construals. In individualist cultures, people are concerned about expressing their own ideas and behaving consistently with their intentions; therefore, they are less likely to be influenced by what other people think (Markus & Kitayama, 1994). In contrast, in collectivist cultures, collective goals and group harmony are valued; therefore, in these cultures, people are more likely to conform to cultural norms (Markus & Kitayama, 1991; Markus & Kitayama, 1994; Triandis, 1989). Furthermore, conformity has different meanings or implications in individualist cultures and in collectivist cultures. Nonconformity is interpreted as uniqueness in individualist cultures, whereas in collectivist cultures, the same behavior is interpreted as deviation (Kim & Markus, 1999). Therefore, in individualist cultures, conformity is not perceived as positively as in collectivist cultures. The differences in the influence of implicit cultural norms on behavior may reflect these differences in cultural ideals and self-construals.

### General Discussion

These studies suggest that we can measure implicit norms and that these implicit norms can have a powerful influence on social perception and behavior. In Studies 1a and 1b, we demonstrated that our measure of implicit norms predicted scores on the traditional IAT, but more importantly did so independently of implicit attitudes. This finding suggests that the traditional IAT assesses not only personalized associations but social associations as well. In Study 2, we found that acculturation shapes implicit norms. The longer Asian-Canadians spent time in Canada, the more negative their implicit norms

about the elderly became, whereas their identification with Canadian culture tended to predict implicit attitudes. In Study 3, we demonstrated that implicit norms can develop through repeated exposure to a novel stimulus that is paired with consensually positive or negative stimuli. This study demonstrates that implicit norms can be manipulated as well as measured. Finally, in Study 4, we demonstrated that implicit norms can affect behavior and that the effects of implicit norms varied by culture. Among Asian-Canadian implicit norms about eating vegetables were positively related to actually eating vegetables. In contrast, among European-Canadians implicit norms were negatively related to eating vegetables. These relations were robust and remained significant even when controlling for explicit norms and implicit and explicit attitudes about eating vegetables. Together, these data suggest that implicit norms are distinct from implicit attitudes and uniquely predict behavior.

Furthermore, we obtained these findings despite using different operationalizations of implicit norms. In Study 1a and 1b and Study 3, we examined the association between what “most people like” and “most people don’t like” and flowers and insects, apples and candy bars, and cartoon characters, in Study 2 we examined the association between “most people believe in” and “most people don’t believe in” and older and younger people. Finally, in Study 4, we examined the association between “people approve of” and “people disapprove of” and chips and vegetables. We utilized the specific labels and relevant exemplars that seemed most appropriate in the context, and despite these different operationalizations we found consistent evidence that implicit norms are distinct from implicit attitudes. Future research should address whether these different operationalizations represent meaningfully different types of implicit norms

(e.g., implicit descriptive vs. implicit injunctive norms).

#### Does Exposure to Society Shape Our Thoughts and Actions?

Our data suggest that people who are exposed to different cultural milieus develop different implicit norms. In Study 2, Asian-Canadians who had spent more time in Canada were more likely to have negative implicit norms towards the elderly than Asian-Canadians who have lived in Canada for a short time. Importantly, identification with Canadian culture did not predict the change in implicit norms. We reason that to change implicit norms, one only needs to be exposed to the culture and observe how others interact with the elderly. These implicit norms can be transmitted without explicit endorsement. In contrast, identification with Canadian culture predicted implicit attitudes towards the elderly. To the extent that Asian-Canadians included Canadian culture in their self-concept, the more negative implicit attitudes they had towards the elderly.

Study 3 provided more direct evidence that exposure to stimuli that are culturally positive or negative can influence implicit norms about an unrelated object. When an object is repeatedly paired with consensually positive or negative stimuli, implicit norms about the objects develop.

Finally, we found that implicit norms have a different influence on behaviors for people from different cultures (Study 4). Asian-Canadians followed implicit norms, whereas European-Canadians reacted to implicit norms by acting in opposition to them under ego-depleted mental states. In Western cultures, in which autonomy and independence is emphasized, deviation from the norms may allow people to express uniqueness (Kim & Markus, 1999; Markus & Kitayama, 1991; Markus & Kitayama, 1994). Thus, deviation from norms may be valued in Western societies. In contrast, in

Eastern cultures, in which group harmony and interdependence are emphasized, deviation from norms can be seen as non-conformity (Kim & Markus, 1999; Markus & Kitayama, 1991; Markus & Kitayama, 1994). Thus, those who deviate from norms may be held in suspicion in Eastern societies. Our data are consistent with these cultural values.

#### Do the Influences of Norms Remain Outside of Awareness?

In Study 2, we did not find any evidence that time spent in Canada influenced Asian-Canadians' explicit norms. This measure of acculturation, however, did affect implicit norms. This finding suggests that explicit and implicit norms are distinct. Furthermore, this research raises some interesting questions about the process of acculturation. Are explicit norms faster to change than implicit norms? In the current studies there were no differences in explicit norms (i.e., ratings of whether most people like the elderly on a 7-point scale) based on the amount of time that Asian-Canadians had been in Canada, and Asian-Canadians did not report more positive explicit norms than European-Canadians ( $M = 4.13$ ,  $SD = 1.09$ ;  $M = 4.42$ ,  $SD = 1.13$ , respectively;  $F_{(1,186)} = 3.12$ ;  $p > .05$ ). In the absence of having an actual Asian sample this finding is consistent with either rapid change in Asian-Canadians' explicit norms or no cultural differences in explicit norms, but on balance it seems more likely to us that Asian-Canadians' explicit norms changed rapidly. It may be that after immigrants acquire new cultural norms at the explicit level, they may retain norms from their own culture at the implicit level, and that this discrepancy between implicit and explicit norms may pose unique challenges for immigrants. Further research should address these questions.

#### Implication for Research on Implicit Processes

The studies presented in this paper have important methodological and theoretical

implications for understanding implicit processes. Methodologically, this research is the first to demonstrate that implicit norms can be measured using the implicit association test. Olson and Fazio (2004) showed that by changing the category labels from “pleasant” and “unpleasant” to “I like” and “I don’t like,” the IAT measures implicit attitudes. Following Olson and Fazio’s methodology (2004), we showed that by changing the category labels from “pleasant” and “unpleasant” to “most people like” and “most people don’t like,” the IAT measures implicit norms. More generally, this research suggests that the traditional IAT may be useful in the domains in which implicit attitudes and norms are congruent with each other. However, our studies suggest that when implicit attitudes and norms predict behavior in opposite directions, it is useful to use a specific implicit attitudes measure or implicit norms measure. For example, among European-Canadians implicit attitudes and norms predicted eating behavior in opposite directions. Therefore, the traditional IAT, which seems to be influenced by both implicit attitudes and norms, may not be able to predict behavior in such situations when implicit attitudes and norms are at odds.

Theoretically, this research suggests that understanding implicit norms may be essential to fully account for the influence of society on thought and behavior. Previous research on how norms influence thoughts and behavior has tended to focus on explicit measures (e.g., Cialdini & Trost, 1998; Markus & Kitayama, 1991). Yet the current research suggests that social perception and behavior can be influenced by implicit norms. Future research should examine how much of the influence of norms on thought and behavior occurs through implicit processes, how much occurs through explicit processes, and how these two levels of processing interact.

Finally this research highlights the importance of subtle social influence. When people simply live in a society it shapes the way they think by the formation of associations between any number of objects and groups with what most people like and what most people value. These associations once formed can be changed, but it seems likely that they are often a persistent force in people's lives. Like de Tocqueville's description of the Puritans we all may carry the associations of the societies we have encountered and these associations in turn may have a powerful influence on our social perception, behavior, and the institutions we develop.

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## Author note

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## Footnotes

<sup>1</sup> Because we did not counterbalance the order of blocks within the IAT, we do not interpret our results in terms of absolute zero.

<sup>2</sup> One participant completed two tasks on the same day by mistake; however, inclusion or exclusion of this participant did not influence the result. We included this participant to be conservative.

<sup>3</sup> The implicit attitudes towards flowers and insects were not correlated with implicit attitudes towards apples and candy bars ( $r = -.09$ , ns). Similarly, implicit norms towards flowers and insects were not correlated with implicit norms towards apples and candy bars ( $r = .13$ , ns). These results provided further evidence of discriminant validity.

<sup>4</sup> Because we used a mass-testing questionnaire that measured the length of time in country of origin, we measured the length of time spent in Canada based on the time spent in country of origin. Most people came to Canada directly from their birth country; therefore, the length of time spent in Canada can be estimated by subtracting the length of time spent in country of origin from participants' age.

<sup>5</sup> We eliminated data for four participants on the implicit attitudes measure.

<sup>6</sup> We reasoned that injunctive norms or norms about what people should or ought to do are closest in content to Fishbein and Ajzen's (1974) concept of subjective norms. We thus attempted to measure implicit injunctive norms in this study and used the category labels "people approve of," instead of "most people approve of," because we felt "most people approve of," could be taken to indicate that not all people approve of the action and thus such a category label took away from the injunctive nature of the norm.

<sup>7</sup> Three Asian participants indicated 7 out of 11 when rating how strongly they

identified with Asian culture; however, inclusion or exclusion of these three participants did not influence the results. We reported results including these three participants to be conservative.

<sup>8</sup> One participant completed the pre-test measures on the same day as the lab session; however, inclusion or exclusion of this participant did not influence the result. We included the participant to be conservative.

Table 1

*Implicit norms and implicit attitudes across conditions (Study 3)*

	Experimental Condition		Control Condition	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Implicit Norms	114.07	142.11	49.64	87.52
Implicit Attitudes	-5.22	121.39	40.09	99.78

*Note.* Higher scores indicate more favorable attitudes or norms towards the character that was paired with positive US than the one paired with negative US.

## Figure Captions

*Figure 1.* The relations of implicit attitudes and implicit norms to the traditional IAT in the domain of flowers vs. insects (Study 1a).

*Figure 2.* The relations of implicit attitudes and implicit norms to the traditional IAT in the domain of apples vs. candy bars (Study 1b).

*Figure 3.* The relations of length of time spent in Canada and strength of identification with Canadian culture to implicit cultural norms about older people (Study 2).

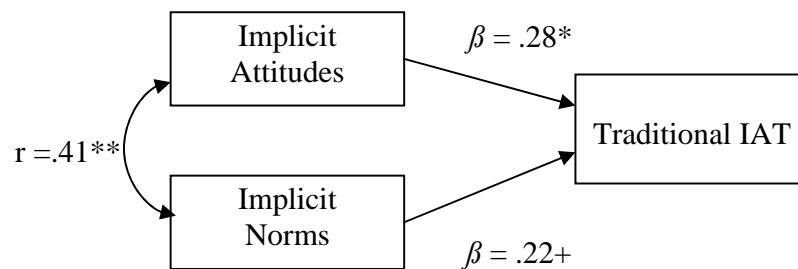
*Figure 4.* The relations of strength of identification with Canadian culture and length of time in Canada to implicit attitudes towards older people (Study 2).

*Figure 5.* Implicit attitudes predicting eating behaviors among European-Canadians and Asian-Canadians (Study 4).

*Figure 6.* Implicit norms predicting eating behaviors among European-Canadians and Asian-Canadians (Study 4).



Figure 1

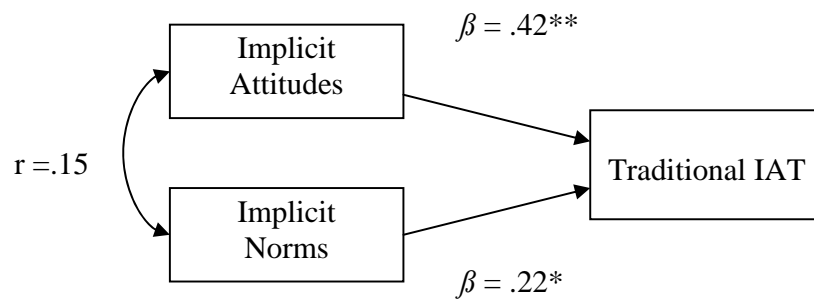


+  $p < .10$

\*  $p < .05$

\*\*  $p < .01$

Figure 2



\*  $p < .05$

\*\* $p < .01$

Figure 3

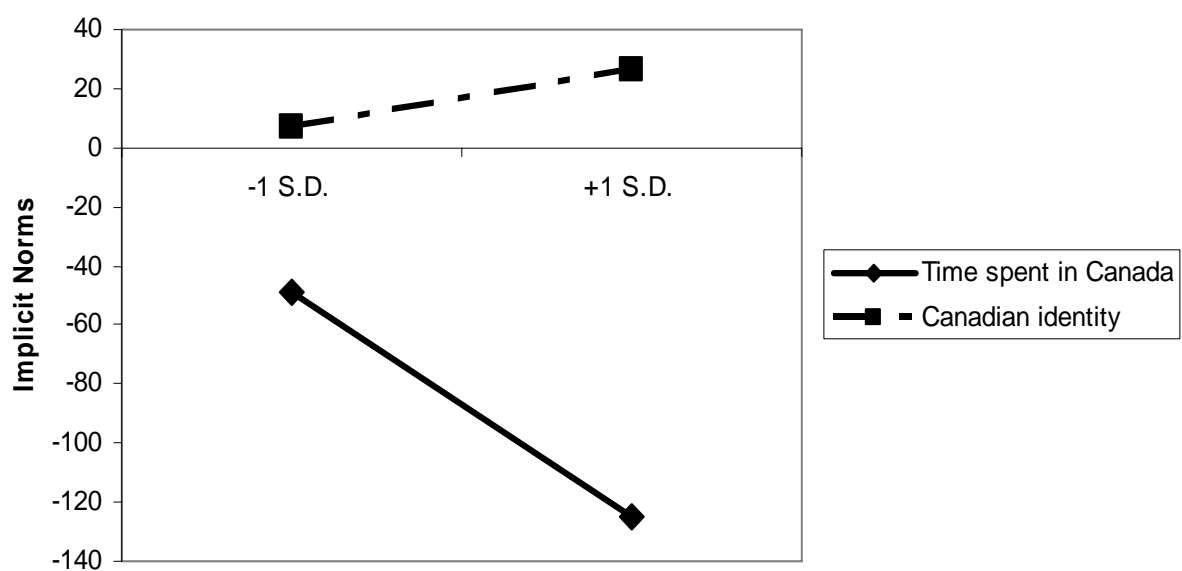


Figure 4

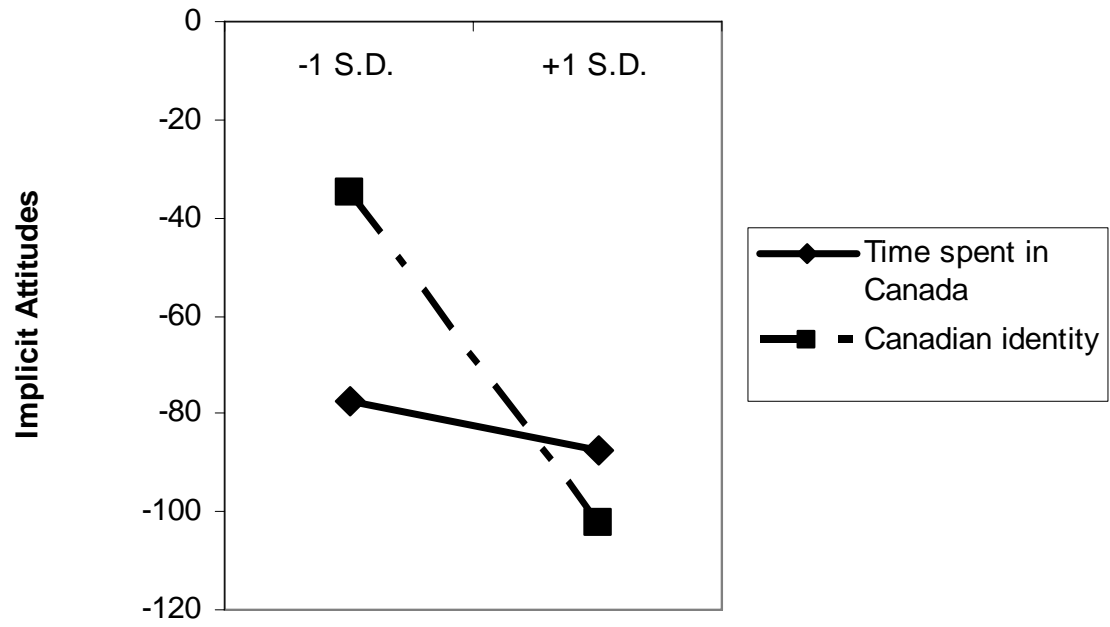


Figure 5

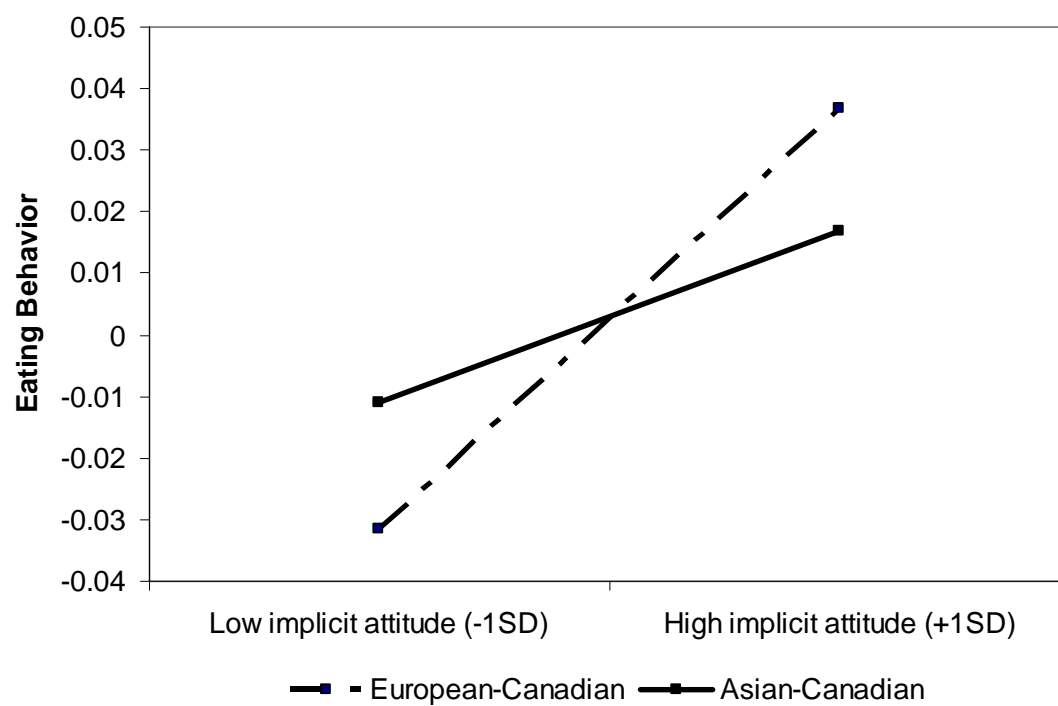


Figure 6

