The Influence of Implicit Cultural Norms versus Personal Attitudes and Uncertainty Orientation on Eating Behaviour

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ABSTRACT

The moderating effects of Uncertainty Orientation on how normative and personal attitudes predict eating behaviour was examined. Uncertainty Orientation focuses on how people seek out and integrate information about themselves, others, and their environment. It distinguishes between people who are uncertainty-oriented (UOs), that confront uncertainty with the intention of resolving it; and people who are certainty-oriented (COs), in that they attempt to maintain certainty, by creating a predictable environment and maintaining preexisting beliefs. Participants were given either a cultural norms IAT or a personal IAT, as well as measures of explicit attitudes toward eating chips and vegetables. They were then given vegetables and chips to eat, ostensibly as a market research task. Explicit attitudes did not predict eating behaviour. However, a significant interaction on eating behaviour was found suggesting that implicit normative attitudes activated systematic information processing for COs, whereas implicit personal attitudes activated systematic information processing for UOs.

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Research has demonstrated that the Implicit Association Test (IAT, Greenwald, McGhee, & Schwartz, 1998) assesses not only implicit attitudes, but also extrapersonal and cultural associations acquired through learned processes and socialization (Han, Olson, & Fazio, 2006; Olson & Fazio, 2004). Olson and colleagues developed the "personalized" IAT which assesses implicit personal associations without the influence of cultural associations. Conversely, Yoshida, Peach, Spencer, and Zanna (in press) developed an IAT that specifically measures the cultural and normative component of the standard IAT.

Markus and Kitayama's work in cultural psychology (1991, 1994) argues that, compared to individuals in Eastern cultures, those in Western cultures have a different self-construal of the interdependence between the self and others. They argue that those in Western culture have a stronger motive to stand out, whereas those in Eastern cultures have more motivation to act like the group. Thus, Yoshida et al., (in press) expected and found that the normative IAT and personal IAT are better predictors of behaviour for those in Eastern culture and Western cultures respectively.

An Individual Difference Approach

The theory of uncertainty orientations posits that individuals differ in how they seek out and integrate information about themselves, others, and their environment (Roney & Sorrentino, 1995; Hodson & Sorrentino, 2001; Sorrentino, Short, & Raynor, 1984). Individuals characterized as uncertainty-oriented (UOs) are motivated by uncertain situations and as a result, resolution of this uncertainty guides their cognition and behaviour. On the other hand, those characterized as certainty-oriented (COs) are motivated by maintaining clarity of the known and avoid situations requiring resolution of uncertainty. Simply stated, UOs are positively motivated by resolving uncertainty, whereas COs are positively motivated in maintaining certainty.

Due to these differences in uncertainty resolution, it was hypothesized that differences in preferences would be found as a function of uncertainty orientation. Since COs rely on the group more than their own beliefs when it comes to making decisions (Hodson & Sorrentino, 2001; Norman, Sorrentino, Windell, Manchanda, 2008; Sorrentino, Seligman, & Battista, 2007), we predicted that COs' behaviours will be better predicted by the cultural norms IAT than the personalized IAT because of their deference to the in-group and its norms. In contrast, we predicted that UOs' behaviours will be better predicted by the personalized IAT than the cultural norms IAT, because of their self-orientation.

Method

Participants

A total of one hundred and twenty introductory psychology students from the University of Western Ontario were recruited through the participant pool. Six participants were omitted from the analysis for not completing the study and/or not following instructions, and 24 were omitted for being from an interdependent culture—a potential confound. This resulted in a sample of 90 participants (33 men, 57 women, aged 17 to 27, $M = 18.50$, $SD = 1.30$), with 46 and 44 participants in the normative and personal conditions, respectively. Participants received course credit in exchange for their participation.

Measures and Manipulations

Uncertainty Orientation. In line with Atkinson's work that suggests both approach and avoidant measures of a personality dimension (Atkinson, 1964; Atkinson & Feather, 1966), uncertainty orientation is assessed by one's desire to resolve uncertainty and one's desire to maintain predictability (see Frederick and Sorrentino, 1977 and Sorrentino, et al., 1990 for reviews). It is assumed that one's desire to maintain clarity is independent from one's motivation to overcome uncertainty. As such, an individual may be high or low on both of these motives and thus a resultant measure, one that controls for both, is a better predictor than a single measure. Uncertainty is measured by a projective measure based on the Thematic Apperception Test (TAT; Sorrentino, Roney & Hanna, 1992) and is used to assess an individual's desire to resolve uncertainty about the self and the environment. Expert scorers, who have achieved an inter-rater reliability of greater than 0.9 scored the TAT. The desire to maintain clairy is measured through the authoritarian component using Cherry and Byrne's (1977) acquiescence-free message of authoritarianism, which measures authoritarianism using a 21-item measure on a 6-point scale (from -3, "I disagree very much" to +3, "I agree very much"). For example, "What the youth needs most is strict discipline, rugged determination, and the will to work and fight for family and country." Thus, uncertainty orientation is the resultant measure of uncertainty, composed of individual measures of *n*Uncertainty (uncertainty scores standardized) and authoritarianism.

Each participant's *n*Uncertainty and authoritarian scores were standardized into z-scores and subsequently the authoritarian z-scores were subtracted from the *n*Uncertainty z-scores to give the resultant measure of uncertainty orientation (RUM), with those receiving higher scores considered to be more Uncertainty-Oriented and those receiving lower scores considered to be more Certainty-Oriented.

Personal Implicit Attitudes. Personal attitudes were assessed with a personal IAT. The categories assessed were "I like" and "I don't like" as well as "Potato chips" and "Vegetables." Positive words, such as sunshine, friends, etc. were used as positive attribute stimuli (I Like), whereas negative words (e.g. vomit, disease, etc.) were used for negative stimuli (I Don't Like). Pictures of various potato chip brands (e.g. Humpty Dumpty, Lay's, Ruffles, etc.) and various vegetables (carrots, broccoli, etc.) were used for their respective category. Higher values on the IAT correspond to relatively higher liking of chips over vegetables.

Normative Implicit Attitudes. Normative attitudes were assessed with a normative IAT. The categories assessed were "Most People Approve of" (stimuli: exercising, helping, sharing, etc.) and "Most People Disapprove of" (stimuli: cheating, abusing, murdering) as well as "Potato Chips" and "Vegetables" (stimuli remained consistent with the personal IAT). Once again, higher values on the IAT correspond to relatively higher liking of chips over vegetables.

Explicit Measures: The explicit measures consisted of 18 questions on a 7-point Likert scale. Nine of the questions measured attitudes towards chips, whereas 9 of the questions assessed attitudes towards vegetables. For example, participants were asked to indicate their overall evaluation of potato chips/vegetables from 1, 'extremely unfavourable' to 7, 'extremely favourable.'

Consumption of Chips and Vegetables. The weight of chips and vegetables in their respective containers was measured prior to consumption. To determine level of consumption, the final weight was subtracted from the initial weight for both types of food. In order to parallel the IAT, 'food consumption' was calculated by subtracting the consumption of vegetables (in grams) from the consumption of chips (in grams).

Procedure

Participants were tested individually. Upon arriving, they completed a consent form and were led to a room with a computer. They were first given a sentence completion task and authoritarian scale to assess uncertainty. Following that task, participants were randomly assigned to either the personal or normative condition and then completed an IAT (either personal or normative) and the explicit attitude measures (counterbalanced). The experimenter then brought chips and vegetables as well as three dips and asked the participants to evaluate the dips, ostensibly for marketing purposes. Participants were given a brief paper questionnaire to indicate how much they liked each dip and how much they would pay for them. Unbeknownst to the participants, the weights of the chips and vegetables were measured to determine how much they ate.

Results

A multiple regression analysis of variance using effect coding and Model I was conducted with two continuous variables (IAT scores; and the resultant measure of uncertainty, RUM), and one dichotomous categorical variable (Normative vs. Personal) on the dependent variable, the amount of vegetables versus chips eaten. The IAT scores were transformed using their natural logarithm. A signifi-

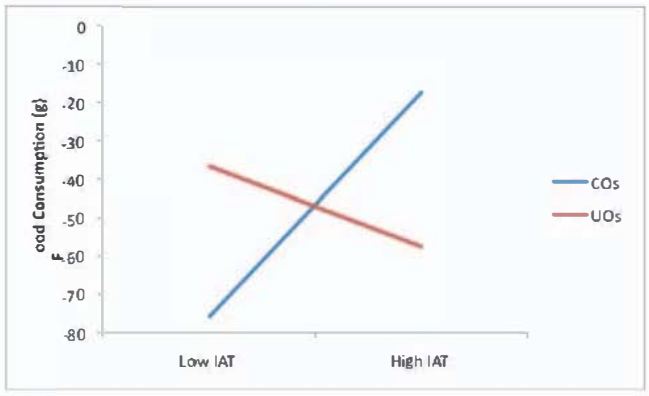

Figure 1. Food consumption in grams as a function of personal IATs measured at +/. 1 standard deviation and uncertainty orientation, UOs vs. COs. Food consumption was measured in grams by the weight of vegetables eaten subtracted from the weight of chips eaten.

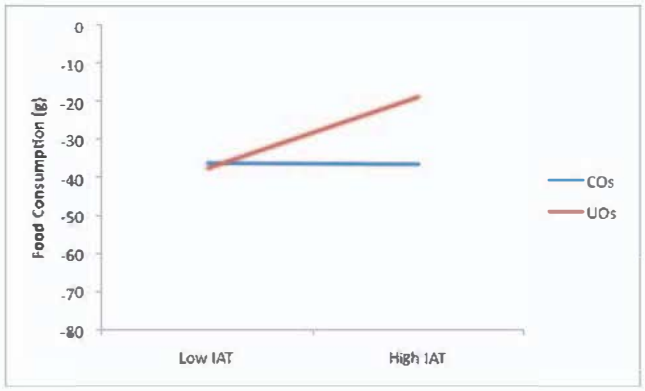

Figure 2. Food consumption in grams as a function of normative IATs measured at +/. 1 standard deviation and uncertainty orientation, UOs vs. COs. Food consumption was measured in grams by the weight of vegetables eaten subtracted from the weight of chips eaten.

cant effect was obtained for the three-way interaction, , indicating that the interaction between uncertainty orientation and the prediction of food consumption using an IAT, differed between the personal IAT and the normative IAT $\beta = .21$, $t(81) = 3.97$, $p = .05$. This interaction suggests that the prediction of implicit attitudes on food consumption is moderated by uncertainty orientation and the type of implicit measure.

Using the procedure suggested by Baron and Kenny (1986), to test moderating effects, a tertile split was performed on uncertainty orientation to produce the two groups of interest, UOs (high values) and COs (low values), with moderates excluded as established by the theory of uncertainty orientation (see Sorrentino & Roney, 2000, for a review). We regressed food consumption on IAT scores separately for UOs and COs and for normative and personal IATs. Two t-tests were performed to test the differences between the regression coefficients for UOs and COs for the personal IAT and the normative IAT. The analyses revealed that for the personal IAT, the regression coefficient for COs, $b = 151.89$, $t(10) = 3.24$, $p = .01$, and that for UOs, $b = -.54.78$, $t(13) = -.649$, $p = .53$, were marginally significantly different, $t(24) = 1.96$, $p = .06$ (see Figure 1). However, for the normative IAT, the regression coefficient for COs, $b = -.78$, $t(15) = -.02$, $p = .99$, and that for UOs. $b = 49.30$, $t(13) = 1.30$, $p = .22$, did not significantly differ from each other, $t(28) = -.84$, $p = .41$ (see Figure 2). Overall, the pattern depicted in Figure 1 and Figure 2 shows that the personal IAT positively predicts food consumption for COs but not for UOs. The normative IAT, on the other hand, appears to positively, but not significantly predict (presumably due to low sample size) food consumption for UOs and not for COs.

Additional analyses revealed the same three-factor pattern of interaction predicted total food consumption (total chips and vegetables eaten), $\beta = -.251$ $t(81) = -2.21$, $p = .02$ and vegetable consumption alone $\beta = .249$ $t(81) = 2.28$, $p = .03$, but not chip consumption alone $\beta = 1.33$, $t(81) = 1.19$, $p = .24$. Similar to other research, (Hofman, Rauch, & Gawronski, 2007), explicit measures did not predict food consumption, $R^2 = .21$, $p = .52$.

Discussion

The results of this study demonstrate a significant interaction whereby COs preference of chips to vegetables was better predicted by their implicit personal attitudes, whereas the eating behaviour of UOs was better predicted by their normative attitudes.

This is contrary to what was expected, however. In hindsight, it appears that when participants were asked to evaluate their preference for food, it activated different processing strategies, which led to these results. Given that their task was to evaluate various food dips, it is suggested that measurement of attitudes activated systematic processing for UOs such that when asked about their personal attitudes they were more likely to engage in controlled food consumption. COs, on the other hand, are engaged when asked to think about the opinions of others and as such engaged in more systematic processing in those situations. Systematic processing should lead people to evaluate and rate foods more carefully and in doing so engage in controlled food consumption, such as trying both foods out. This possibility is supported by the additional analyses reported above, which demonstrated that UOs ate significantly more food in total, and specifically more vegetables (but not chips) in the implicit personal attitudes condition than in the implicit norms condition, whereas COs did exactly the opposite.

Implicit attitudes are regarded as automatic and should predict behaviour when individuals are not engaging in controlled actions (Bargh, 1994). In situations where partici-

pants are actively engaged, however, implicit attitudes should not predict eating behaviour. Following this reasoning, it is logical to propose that UOs, when primed with personal attitudes questions, should be engaged in systematic processing and thus their implicit attitudes should not predict their food preference. On the other hand, when UOs are not engaged, after being primed with normative questions, their implicit attitudes should better predict their preferences. COs should display the opposite pattern; having their implicit attitudes predict their inclinations when not engaged (primed by implicit personal attitudes) but should not predict their preferences when they are engaged as a function of normative questions.

These data suggest that being asked to reflect on one's own personal or normative attitudes can activate systematic processing, and that this effect is moderated by UOs and COs respectively. However, the question then posed is why did the results differ from those of Yoshida et al. (in press)? Our cross cultural research (Sorrentino et al., in prep) has shown that Chinese participants may be even more uncertainty-oriented than their Canadian counterparts and perhaps Yoshida et al.'s (in press) sample of Chinese participants showed the same trend.

Additional research is needed to better support the idea that systematic processing can be activated by priming one to think about personal or normative attitudes. However, the need for individuals to process information is fundamental and permeates some of our most important decisions and responsibilities, such as deciding whether an alleged criminal is guilty or when voting for a politician. Thus, if systematic processing is activated differently for different individuals, this not only provides important basic knowledge of psychological processes but vital information for applied research.

Résumé

Les effets modérateurs de l'orientation face à l'incertitude sur la façon dont les attitudes normatives et personnelles prédisent le comportement alimentaire ont fait l'objet d'un examen. L'orientation face à l'incertitude se concentre sur comment les personnes cherchent et intègrent de l'information à leur sujet, les autres et leur environnement. Elle fait la distinction entre les personnes qui sont orientées dans l'incertitude (OI), qui font face à l'incertitude dans l'intention de la résoudre; et les personnes qui sont orientées dans la certitude (OC), dans le sens qu'ils tentent de maintenir la certitude, en créant un environnement prévisible et en maintenant des croyances préexistantes. Un test des associations implicites (IAT) de normes culturelles ou un IAT personnel a été administré aux participants, et des attitudes explicites ont été mesurées à l'égard de la consommation de croustilles et de légumes. On leur a ensuite donné des légumes et des croustilles à manger, soi-disant dans le cadre d'une recherche de marché. Les attitudes explicites ne laissaient pas présager de comportement d'alimentation. Cependant, une interaction importante avec le comportement d'alimentation a été trouvée suggérant que des attitudes normatives implicites activaient le traitement de l'information systématique de l'OC, alors que les attitudes personnelles implicites activaient le traitement de l'information systématique de l'OI.

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