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Dialectical thinking and health behaviors: The effects of theory of planned behavior

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The primary purpose of this study was to investigate whether the theory of planned behavior (TPB) mediated the relationship between dialectical thinking and health behaviors. A sample of 285 undergraduates was tested with a dialectical thinking styles scale, health promoting lifestyle profiles, and TPB questionnaires. Structural equation modeling was used for data analysis. Results indicated that all the three dimensions of thinking styles (belief in the connection, acceptance of change, and acceptance of contradiction) exerted significant effects on TPB constructs. Specifically, the connection and the change dimensions had positive effects on health behaviors mediated by TPB, whereas the contradiction dimension had a negative effect. Model 2 showed a satisfactory fit, demonstrating the influential pathways between dialectical thinking and health behaviors. Implications in issues of health promotion and future research are discussed.

Keywords: Dialectical thinking; Theory of planned behavior; Health behaviors.

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Almost 17 million lives are lost every year from chronic disease, making this the leading cause of death. Most of these diseases are the results of harmful habits such as drinking, smoking, and lack of exercise (World Health Organization (WHO), 2005). According to a WHO report (2003), the health of a population is a critical determinant of economic and social development. To this end, the work of psychologists in improving the health of our populations will benefit individuals’ wellbeing as well as societal development.

Indeed, improving individuals’ health condition is the key objective of applied psychology. However, a glance back at previous empirical research suggested two main concerns that constrained its contribution to health behavior issues. On one hand, considerable research focused on the association between individual characteristics and health behaviors (e.g., Bing, 2003; Friedman, 2000; Li & Hou, 2007; Ryan & Frederick, 1997) with the influential pathways insufficiently studied; on the other hand, a great deal of research separately investigated a single facet of health-related behaviors, such as diet, physical activity, and alcohol consumption (Conner, Warren, & Close, 1999; Nejad, Wertheim, & Greenwood, 2004; Sniehotta, Scholz, & Schwarzer, 2005) instead of the holistic scope of health behaviors. In the current study, we propose a model in which a personal characteristic (Chinese dialectical thinking styles) predicts holistic health behaviors through our social cognitive process: the theory of planned behavior (TPB; Ajzen, 1991).

**DIALECTICAL THINKING**

Crosscultural psychologists have shown strong evidence that culture shapes not only our beliefs of the world but also our epistemologies and cognitive processes (Nisbett, Peng, Choi, & Norenzayan, 2001; Peng & Nisbett, 1999). As a result, the content and style of how individuals think is largely dependent on the culture they reside in. Nisbett and his colleagues (2001) claimed that rooted in the cultural history of ancient China, the East Asians, especially the Chinese, hold a dialectical thinking style based on three primary principles:

The first one is the principle of contradiction: partly because change is constant, contradiction is constant. Thus old and new, good and bad exist in the same object or event and indeed depend on one another for their existence; the second one is the principle of change: reality is a process that is not static but rather is dynamic and changeable. A thing need not be identical to itself at all because of the fluid nature of reality; the third one is the principle of holism: because of constant change and contradiction, nothing either in human life or in nature is isolated and independent, but instead everything is related. (p. 301)

This Chinese dialectical thinking has been confirmed by crosscultural comparison. Specifically, for contradiction, the Chinese were found to prefer dialectical proverbs that consist of contradiction, compared with Americans (Peng & Nisbett, 1999); regarding change, Chinese people were more likely to predict change as well as predicting greater change than Americans did (Ji, Nisbett, & Su, 2001); in terms of holism, the Chinese were more likely to associate the object with background, suggesting that the Chinese were more field-dependent and holistic in their thinking (Ji, Peng, & Nisbett, 2000).

Based on this naive dialecticism theory, the Chinese thinking styles scale was developed and three dimensions were included: belief in connection, acceptance of contradiction, and acceptance of change (Hou, 2004). Recent studies had shown a close association between dialectical thinking and individual health among Chinese people. For instances, belief in connection and acceptance of change was significantly correlated with increased physical activity and decreased psychological stress (Li & Hou, 2007); acceptance of contradiction, however, was correlated with higher psychological stress, unhollower life habits, and poor mental health (Bing, 2003; Li & Hou, 2007). Similarly, crosscultural studies indicated that East Asians were more likely to experience negative emotions and exhibit greater “ambivalence” or evaluative contradiction in their self-attitudes than Westerners (Kitayama, 1997; Spencer-Rodgers, Peng, Wang, & Hou, 2004). This “ambivalence” was attributed to dialectical thinking: Chinese people tolerated the coexistence of good and bad in their lives (the dialectical principle of contradiction), and consequently, increased dialecticism was related to decreased psychological adjustment (Spencer-Rodgers et al., 2004). In short, dialectical thinking is likely to relate to individual health in both positive and negative ways.

**HEALTH BEHAVIORS**

Health behaviors can be defined as actions of individuals through utilization of health services for the purpose of maintaining, attaining, or
regaining one’s health and avoiding the effects of illness. Such behaviors include behaviors such as making time for sleep, eating balanced meals, exercising sufficiently, and quitting smoking (McEachan, Lawton, & Conner, 2010).

Walker, Sechrist, and Pender (1987) developed the Health Promoting Lifestyle Profile II (HPLP II) scale. This 52-item scale has been administered extensively in various countries and translated into many other languages, such as Spanish and Chinese. Providing a holistic view of health behaviors, HPLP II measures the frequency of health-promoting behaviors in six domains, i.e., nutrition, spiritual growth, health responsibility, physical activity, interpersonal relations, and stress management. With the study by Walker and colleagues as their basis, Wei and Lu (2005) developed a short version of the Chinese Health Promoting Lifestyle Profile (HPLP-S). Results of a normative sample (N = 408) and a crossvalidation sample (N = 559) indicated its good reliability and validity. The HPLP-S selected 24 items from the original scale HPLP II, which consisted of the same six subscales with four items for each. In our present research, HPLP-S was used to achieve a more comprehensive measurement of health behaviors.

THE THEORY OF PLANNED BEHAVIOR

One of the most widely endorsed models in applied social psychology is the theory of planned behavior (TPB; Ajzen, 1991). Empirical reviews of the TPB have supported its utility across various health behavioral domains, including alcohol consumption (Conner et al., 1999), complementary medicine (Furnham & Lovett, 2001), physical activity (Sniehotta et al., 2005), dieting behavior (Nejad et al., 2004), SARS-prevention behaviors (Cheng & Aik-Kwang, 2006), and condom use (Bryan, Ruiz, & O’Neill, 2003).

In the theory of TPB, four social cognitive components—intentions, attitude, perceived behavioral control, and subjective norms—could be identified to predict individuals’ behaviors (Ajzen, 1991). Intention represents one’s motivation in a conscious plan or decision and tends to be a strong predictor of behavior. Attitude to behavior is conceptualized as the degree to which performance of behavior is positively or negatively valued. Subjective norms are defined as perception of social pressure and motivation to comply with these beliefs. Perceived behavioral control (PBC) refers to people’s perception of their ability to perform a given behavior (Ajzen, 1991).

As mentioned above, a large body of studies with TPB focused on a single behavior or one facet of health behaviors (Bryan et al., 2003; Conner et al., 1999; Nejad et al., 2004; Sniehotta et al., 2005). However, it is important to note that TPB could predict a single behavior as well as a holistic behavioral category. For example, a study by Kaiser, Schultz, and Scheuthle (2007) using two cross-sectional surveys of 1394 participants revealed that TPB retained its predictive power and validity even on an aggregated behavioral level (e.g., conservation performance that includes car use avoidance, taking public transportation, saving energy, recycling used paper, etc.). For this reason, in the present research, we used the TPB to predict a set of health-related behaviors including six health-related behaviors derived from HPLP-S.

THE PRESENT INVESTIGATION

This study is to test the hypothesized model (Figure 1) in which we postulate that, as a social cognitive process, TPB would mediate the relationship between dialectical thinking (personal characteristics) and health behaviors (overt behaviors). Given the work just cited, we further predict that belief in connection and acceptance of change affect TPB, and then TPB affects health behaviors in a positive way; acceptance of contradiction, however, exerts a negative effect on health behaviors through the TPB. We do not have an a priori prediction regarding the detailed pathways between the three thinking dimensions and the four TPB components. In other words, we generally predict only positive or negative effects of different thinking dimensions on TPB and health behaviors. Since the present research is the first attempt to address processes of dialectical thinking affecting health behaviors through TPB, we put the question of these specific pathways into an empirical test instead of hypothesizing an a priori prediction.

![Figure 1. Hypothesized model of relationships among personal characteristics, social cognition, and health behaviors.](image-url)
As mentioned above, the design of this study improved in two ways on prior research on health behaviors: (1) in investigating the pathways between dialectic thinking and health behaviors; (2) in widening the scope of health behaviors to offset the deficiencies of previous research on single health behaviors.

**METHOD**

**Participants**

Three hundred undergraduates were recruited from a university in Mainland China. Of these, 285 completed the whole questionnaire (193 females). The mean age of participants was 20.43 years \((SD = 1.72)\).

**Measures**

**Dialectical thinking**

Dialectical thinking was measured with the Dialectical Thinking Styles Scale (Hou, 2004). This 13-item inventory includes three dimensions: four items measure belief in connection (e.g., “There is connection between those things that seem isolated”), five items measure acceptance of change (e.g., “When I get along with the people around me, I always change myself”), and four items measure acceptance of contradiction (e.g., “I often find there is a contradiction in one thing”). All questions are answered on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree): connection, \(a = .73\); change, \(a = .68\); contradiction, \(a = .64\).

**Health behaviors**

Health behaviors were measured using the short-item Chinese Health Promoting Lifestyle Profile (HPLP-S, Wei and Lu, 2005). This scale was developed by Wei and Lu (2005) from HPLP-II and originally developed by Walker et al. (1987). The 24-item inventory measures six dimensions—self-actualization (e.g., “work toward long-term goals in my life”), health responsibility (e.g., “discuss my health concerns with health professionals”), physical activity (e.g., “take part in leisure-time physical activities such as swimming, dancing, and bicycling”), nutrition (e.g., “eat foods without preservatives and other additives”), relationship support (e.g., “maintain meaningful and fulfilling relationships with others”), and stress management (e.g., “concentrate on pleasant thoughts at bedtime”) \((a = .87)\).

The TPB questionnaire consists of four measures: attitude, subjective norms, perceived behavioral control, and behavior intention. Following conventional practices (e.g., Ajzen, 2002; Kaiser et al., 2007), two separate bipolar response scales were conducted for each of the four constructs of TPB. According to the abovementioned six dimensions of HPLP-S, each component of TPB was assessed for each of the six health-related behaviors.

**Attitude**

Attitude to health-related behaviors was measured using seven-point bipolar adjective scales. Six items measured the instrumental (bad–good) aspect of attitude and six items measured the affective (unenjoyable–enjoyable) aspect; thus, there were 12 items for attitude measurement in total. For example, “For me, to choose a diet low in fat and cholesterol is [participants were asked to respond on the continuum of bad–good and unenjoyable–enjoyable].” The 12 attitude items were internally consistent \((a_1 = .72 \text{ and } a_2 = .73)\).

**Subjective norms**

Similarly to the measurement of attitude, subjective norms were measured by rating each of the six behavioral statements on two sorts of seven-point scales. One scale ranged from 1 (unlikely) to 7 (likely), and items began with the opening phrase “Most people who are important to me think I should...” The other ranged from 1 (disagree) to 7 (agree), and statements started with “The people in my life whose opinions I value...” Also, the 12 subjective norms items were internally consistent \((a_1 = .70 \text{ and } a_2 = .78)\).

**Perceived behavioral control**

PBC also was assessed by rating each of the six health behaviors on two sorts of seven-point scales: one ranged from 1 (complicated) to 7 (simple), and the other was from 1 (difficult) to 7 (easy). For example, “For me, to choose a diet low in fat and cholesterol is...” The 12 PBC items were internally consistent \((a_1 = .76 \text{ and } a_2 = .79)\).

**Behavioral intentions**

Behavioral intention was measured using six health behavior items that were rated on a seven-point scale either ranging from 1 (unlikely) to 7
(likely), or ranging from 1 (undecided) to 7 (decided). For example, “I will choose a diet low in fat and cholesterol...” The 12 behavioral intentions items were internally consistent ($\alpha_1 = .75$ and $\alpha_2 = .74$).

**RESULTS**

Following the conventional practices, each of four TPB components was measured with two different response formats, and six items of each format were parceled as one indicator. Therefore, each TPB component has two indicators (e.g., attitude component has two indicators: att1 and att2).

All models were estimated using the maximum likelihood method with Amos 17.0 for Windows. The proposed model was tested for mediation effects of the TPB between thinking styles and health behaviors. Results indicated that the proposed model failed to fit the data, $\chi^2(197, N = 285) = 627.347$, $p < .001$, RMSEA = .088, CFI = .86, NFI = .81, TLI = .84, GFI = .82 (Model 1, Figure 2). Following traditional recommendations (Bentler & Bonett, 1980), cutoff values of approximately .90 for CFI, TLI, NFI, and GFI and below .08 for RMSEA were adopted as indicators of a reasonable fit between model-implied and observed data.

The modification indices suggested that most of the problems lay in the thinking styles measurement portion of the model. Hayduk (1996) suggested that proportionality constraints within structural equation models often result in failing models when latent concepts are represented by many indicators. Thus, it was recommended to use only the best few indicators for a given concept to lessen the proportionality constraints when confronted with a failing model.

Accordingly, we chose only two items of each aspect of thinking styles to remodel our data. Based on the value of factor loadings, two of the larger ones were chosen for each dimension (Hayduk, 1996). Specifically, Items 2 (“There is connection between those things which seems isolated”; factor loading is .73) and 5 (“There is a correlation between those things which seems no correlation”; factor loading is .87) were selected to represent the connection dimension; Items 9 (“When I get along with the people around me, I always change myself”; factor loading is .48) and 13 (“When I decide to do something, I no longer change my idea”; factor loading is .23) were selected for change dimension, and Items 10 (“I often find there is a contradiction in one thing”; factor loading is .60) and 11 (“I often find myself doing things I do not like”; factor loading is .79) were selected for contradiction dimension.

Internal consistency reliabilities of connection, contradiction, and change, in order, were .77, .69, and .73 respectively. Results indicated that Model 2 (Figure 3) constituted an acceptable fit: $\chi^2(68, N = 285) = 178.77$, RMSEA = .07, CFI = .96, NFI = .94, GFI = .92 and TLI = .94. The total effects of the three dimensions in dialectical thinking:

![Figure 2](image-url)
thinking styles explained 11% of the variance of health-promoting lifestyle behaviors, with attitude, subjective norm, PBC, and intention of TPB explaining an additional 34% of variance of health behaviors. As expected, both connection and change thinking styles positively predicted health behaviors through the TPB. Although thinking of contradiction had no significant effect on either attitudes or subjective norms, it exerted a negative effect on perceived behavioral control. In other words, the influential pathway of contradiction–perceived behavioral control–intention–health behaviors was verified. In addition, the negative correlation between contradiction and health behaviors was observed, implying that the higher the contradiction thinking, the less one would do health behaviors.

In the present study, thinking styles, attitudes, subjective norms, perceived behavioral control, intention, and health behaviors were all measured on self-reported questionnaires. As we know, when the respondent providing the measure of the predictor and criterion is the same person, it is very important to be aware of the common method bias of self-reported measurement. To check whether our study has common method bias and in accordance to the suggestion of Podsakoff and colleagues (2003), we did Harman’s one-factor test. The results indicated that five eigenvalues were larger than 2 and the first factor explained 18.61% of the total variance, suggesting that common method bias was not a significant problem in the present study.

**DISCUSSION**

By the late 1990s and early 2000s, Nisbett and colleagues (e.g., Nisbett et al., 2001; Peng & Nisbett, 1999) have shown that there is a great discrepancy of thinking styles between the West and the East. In contrast to European Americans’ analytic thinking, the Chinese are dialectical in their thinking. They tend to focus on context or the relationships between objects, believe in change and contradiction, and rely less on formal logic. Previous research has documented that dialectical thinking influences Chinese people not only in perception and cognition but also in social beliefs and behaviors (Norenzayan, Choi, & Peng, 2007). In line with this perspective, results of the present study further elucidated the processes of how dialectical thinking exerts its effect on health-related behaviors among Chinese people.
The positive functioning mechanism of connection and change

The results indicate that belief in the connection and acceptance of change positively influences the way people form health-related attitudes and perceive controllability and subjective norms, and in turn, determines intentions related to health behaviors. In other words, the processes that started from these two thinking styles to the four components of TPB and finally to health behaviors were all positive.

This positive pathway could be explained by the fact that individuals who strongly believe in themes of connection and change are expected to tolerate and enjoy different aspects of events and at the same time value social harmony (Nisbett et al., 2001). Accumulating research shows that East Asians highly embrace such social-connected proclivity, which in turn promotes their health-related characteristics including wellbeing and positive emotions (Kitayama et al., 2006; Markus, Uchida, Omorogie, Townsend, & Kitayama, 2006). Thinking of connection and change, therefore, may be expected to increase Chinese people’s socially engaged tendency, and as a consequence, may exert positive influences on their social cognitive process (TPB) and then health behaviors. Results of the present work confirmed this notion in that thinking of connection and change indeed promoted health behaviors through social cognitive processes, by forming people’s healthy attitudes, strengthening their feelings of controllability and subjective norms, and in turn, promoting their intentions for health behaviors.

The negative role of contradiction

In our final model, as expected, the negative relationship between contradiction and health behaviors was observed. Moreover, although contradiction displayed no significant effect on attitudes and subjective norms, it was negatively correlated with perceived behavioral control ($P = .004$). Results of the influential pathway indicated that acceptance of contradiction exerted negative influence on health behaviors by increasing uncontrollable feelings, and then decreasing health behavioral intentions.

According to the work of Nisbett and colleagues (2001), contradiction is ubiquitous and suggests everything including, for instance, both good and bad aspects. Earlier research has shown that contradiction is positively associated with the neuroticism (N) personality trait, and individuals with a high score on contradiction often experience ambivalence in their emotional feelings (Hou, 2004; Spencer-Rodgers et al., 2004). Our results echoed past research findings that individuals who perceived the world as full of inherent contradictions were less likely to feel the controllability of behaviors. In other words, uncontrollable feelings inhibited them from putting their health-related plans or intentions into practice. Taken together, the current study and previous research support the preventive effects of contradiction thinking on health behaviors.

Implications and limitations

From an applied perspective, the present research suggested that dialectical thinking deserved to be taken into account as health-related interventions developed for the Chinese people. Although it is well known that social cognition (e.g., TPB) has strong predictive effects on health behaviors, it is still worthwhile to investigate the predictive power of personal characteristics (e.g., thinking styles). Given that dialectical thinking and health behaviors are closely related, strategies that consider both TPB and thinking styles will bring greater success in promoting health behaviors. To illustrate, high acceptance of contradiction often undermines feelings of controllability, so individuals with high acceptance of contradiction might require extra efforts concerning intervening on feelings of controllability than would those with low acceptance of contradiction. Meanwhile, specific training in enhancing individuals’ belief in connection and acceptance of change could also benefit their health.

Several limitations of the present study should be noted. Firstly, although influential pathways were uncovered, the present cross-sectional design did not permit causal statements. In future investigation, longitudinal studies would be helpful to test the functioning mechanism of dialectical thinking and to investigate the effects of some feasible health interventions. Secondly, the homogeneity of the sample of university undergraduates prevented us from generalizing our findings. Targeting other age groups or clinical populations in future research would crossvalidate the present results and bring more meaningful implications. Thirdly, the mechanism we proposed in the current study needs to be examined across large, representative samples from Eastern and Western cultures, using measures of both Eastern dialectical and Western analytical thinking styles along
with TPB variables. It would be interesting to do some studies concerning cross-cultural validation and comparison. Finally, health behaviors were measured with self-reported questionnaires rather than more valid objective observations. Improved behavioral measurement might be adopted in future research for a more valid result.

CONCLUSIONS

The present study investigated the role of culture-specific cognitive styles, in this case Chinese dialectical thinking styles, along with the theory of planned behavior, to predict Chinese students’ health behaviors. Along with TPB, belief in connection and acceptance of change positively predict health behaviors, while acceptance of contradiction negatively predicts health behaviors. In short, a model employing thinking styles and social cognition to predict health behaviors was verified.

REFERENCES


