

MATCHING AFFECT-RELATED RISK MESSAGE AND COGNITIVE-RELATED RISK
MESSAGE TO NEED FOR AFFECT AND NEED FOR COGNITION: PERSUADING
CHINESE WOMEN TO GET ROUTINE PAP SMEAR TEST

By
Ying Cheng

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ABSTRACT

MATCHING AFFECT-RELATED RISK MESSAGE AND COGNITIVE-RELATED RISK MESSAGE TO NEED FOR AFFECT AND NEED FOR COGNITION: PERSUADING CHINESE WOMEN TO GET ROUTINE PAP SMEAR TEST

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This study aimed to persuade Chinese women between the ages of 35 and 54 to take a Pap smear test every three years in a certified hospital. Cognitive-related vs. affective-related risk messages were created to reflect the two ways people experience risk (risk-as-analysis vs. risk-as-feelings). Following the risk perception attitude framework (RPA), these messages were then examined for their impact on risk perception, attitude, and intention. This study further tested the interaction effect between risk messages and processing styles (need for cognition vs. need for affect). Based on a between-group experiment with three conditions, the results demonstrated that women high in need for affect reported more favorable attitude towards taking a Pap smear test every three years in a certified hospital when reading the affective-related message compared to those who were low in need for affect. Additionally, the data revealed reading the affective-related message, having higher need for affect, self efficacy, and past Pap smear test predicted a positive attitude, and self efficacy and having past Pap smear tests also predicted greater intention to take a Pap smear test every three years in a certified hospital. Limitations and implications for future research are discussed.

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INTRODUCTION

Cervical cancer presents serious health hazards to Chinese women, as evidenced by its rising incidence rates and large number of mortality cases (Arbyn, Walker, and Meijer, 2010; P.R.C. Ministry of Health, 2011; Qiao 2007). According to a study by Arbyn et al. (2010), approximately 40,000 women die from cervical cancer and 75,000 women are diagnosed with this disease in China annually, which accounts for 20% of the incidence of cases worldwide (Qiao, 2007). Moreover, the prevalence of common gynecological cancer has been on the rise over the past decade (P.R.C. Ministry of Health, 2011). For example, from 2000 to 2010, the rate of cervical cancer increased from 9.6/100,000 to 15.1/100,000 (P.R.C. Ministry of Health, 2011) and it has become the seventh most fatal cancer to Chinese women's health (World Health Organization & Institut Català d'Oncologia, 2010). However, despite its potentially lethal effects, most cervix-related cancer can be detected at an early stage, and even be prevented from abnormalities that may lead to cancer, with routine gynecological screening, like Pap smear tests and pelvic exams. Furthermore, cervical cancer can be more successfully controlled if the patients receive early detection and treatment (National Cancer Institute, 2012). Although China's government has launched a series of free cervical cancer screening programs, only 16.8% of Chinese women actually use these programs (WHO & ICO, 2010). Using a health intervention approach may provide one way to overcome women's reluctance to participate in routine cervical screening (Kreuter et al., 2007).

The purpose of this study is to pilot test messages that may be used in an intervention targeting mainland Chinese women ages 35 to 54, based on the joint considerations of professional recommendations and incidence rates. Specifically, the World Health

Organization (WHO, 2006) recommends the starting age of cervical cancer screening for Chinese women should be 30. Additionally, Li, Kang and Qiao (2011) report that a peak of cervical cancer incidence rate occurs in the age range of 35 to 54. This study defines routine cervical cancer screening as taking a Pap smear test every three years based on the suggestions of WHO (2006). As Fishbein (2000) suggests that an intervention will be more effective if it targets one single behavior rather than general behavior categories or goals, this study will follow this definition of behavior and identify the recommended health behavior as taking (action) the Pap smear test (target) every three years (time period) in a certified hospital (context). Additionally, the messages are designed to address the most salient barrier for Chinese women in having routine gynecological screening - perceived risk of getting cervical cancer (Gu, 2010).

LITERATURE REVIEW

Risk Perception Attitude Framework

The risk perception attitude (RPA) framework addresses risk perception, or one's belief of being vulnerable to a negative consequence (Rimal & Real, 2003), and it serves as the guiding model for this study. Developed from the extended parallel processing model (EPPM) (Witte, 1992), the RPA framework suggests that people's intention to engage in self-protective behavior is driven by their perceived risk and perceived efficacy (Rimal & Real, 2003). However, unlike EPPM which relies on fear-based emotional threats, and protection motivation theory which considers risk perception as the main product of an individual's cognitive activities (O'Keefe, 2002), the RPA framework provides room for both cognitive and emotional appraisals of risk. Moreover, EPPM treats risk as a message attribute whereas the RPA framework argues that risk is more related to an individual's perception (Rimal & Real, 2003). Since this paper focuses on Chinese women's response to a persuasion message, the RPA framework is a more appropriate model for addressing the questions set forth in this study.

Within the RPA framework, efficacy belief is defined as individuals' confidence in performing a certain behavior and believing its practice will yield favorable outcomes (Turner, Rimal, Morrison, & Kim, 2006). The second predictor in this framework is risk perception, which involves perceived severity, individuals' perception of the magnitude of the outcome of an unhealthy behavior or a disease, and perceived susceptibility, beliefs about the likelihood of suffering such an undesirable outcome (Rimal & Juon, 2010; Witte, 1994). Risk perception serves as an important motivator for performing risk-ameliorating behaviors. According to Rimal and Real (2003), individuals tend to engage in more risk-reducing behaviors when both

high risk perception and strong efficacy belief are present, but they will not be motivated if they perceive low risk regardless of the strength of efficacy belief.

Based on levels of perceived risk and efficacy belief, the RPA framework segments individuals into a four-cell-matrix: responsive (high risk perception, high efficacy), avoidance (high risk perception, low efficacy), proactive (low risk perception, high efficacy), and indifference (low risk perception, low efficacy). Rimal and Real (2003) argue that those who fall in the responsive category are the most likely to adopt protective health behaviors because they are more convinced of the possibility and seriousness of their risk and their ability to avoid such risk compared to other groups. Further, Rimal and Real (2003) note that individuals' risk perceptions and efficacy beliefs are not just category standards or fixed individual differences, but factors in messages can be strategically manipulated by communication(Rimal & Real, 2003), through media content and social networks. That is to say, if a message can raise Chinese women's risk perception of getting cervical cancer and convince them of efficacy in averting such a risk, they will be more likely to engage in routine Pap smear testing than those who are only informed of efficacy and those who do not receive any intervention.

To date, the RPA framework has been successfully applied to predict and promote a myriad of health practices, such as breast cancer self-exam screening(Rimal & Juon, 2010), HIV/AIDS prevention (Rimal, Böse, Brown, Mkandawire, & Folda, 2009), skin cancer prevention (Rimal & Real, 2003), and information seeking(Turner et al., 2006). However, this model has not yet been used in the context of promoting routine cervical cancer screening. An application of the RPA framework to persuade Chinese women to take Pap smear tests may not only broaden its theoretical scope, but also add additional empirical support for this model.

Affect-related Risk VS. Cognitive-related Risk

As previously mentioned, research from psychology reveals that people process risk in two separate ways: through an analytic system and experiential system (Epstein, 1994; Loewenstein, Weber, Hsee, & Welch, 2001; Slovic, Finucane, Peters, & MacGregor, 2004). Slovic et al. (2004) argue that when engaging in the analytic system, people tend to statistically and factually calculate the probability and severity of danger. This process of understanding risk through analysis requires relatively great cognitive effort and longer processing time. In contrast, when people assess risk in an experiential way, they are more likely to rely on their imagination, emotion-laden past experience, and instinct associated with the risk. When people approach risk as feelings, their decision-making will be faster and more automatic.

However, dual-risk processing researchers differ in their perspective on the pathways of cognitive evaluation and affective response in the process of risk perception and behavior change. Researcher such as Loewenstein et al. (2001) argue that cognitive response and risk feelings influence each other in a reciprocal way that leads to behavioral outcomes. Contrary to the consequentialists' perspective that only considers feelings as a by-product of cognitive judgment of risk, these scholars suggest that cognitive evaluation and affective response operate as parallel systems, both of which are impacted by anticipated outcome and subjective probability. Moreover, affect and emotions can also be determined by factors, such as vividness of risk depiction, background mood, and risk immediacy, that do not contribute to the analytical system. Alternatively, other scholars (Dunlop, Wakefield, & Kashima, 2010; Epstein, 1994) propose "feeling risk" has greater influence on behavior than "thinking risk". Although Epstein (1994) acknowledges that the analytical system and experiential system jointly

determine people's behavior, he claims experiences outweigh analysis in that the former, which is associated with emotions, and provide more compelling evidence than abstract reasoning. This idea is consistent with the study of Dunlop et al. (2010) which reveals that there is a significant association between felt risk of skin cancer and intention to change, whereas this correlation does not exist between cognitive response and intention. However, despite the divergence with regards to the relative role of cognitive and emotional responses in the process of risk decision-making, dual risk processing scholars agree that the affective-related risk perception has a direct influence on behavior.

The notion of two psychological processing modes of risk suggests that risk persuasion messages can appeal to both affective components and cognitive components of risk perceptions. For example, in an affective-related risk message, a hazardous event is associated with narratives, images or experiences that are linked to affect and emotion in order to induce risk perceptions. In contrast, a cognitive-related risk message appeals to statistics, facts, and reasoning in order to activate individuals' risk-as-analysis thinking mode. By providing evidence that matches the psychological activities underlying the analytical system and experiential system, risk communication can thus apply risk-as-analysis and risk-as-feelings to persuasion.

Even though some scholars have raised concerns that risk communication overly focuses on the cognitive component of risk perception (Visschers et al., 2012), persuasion literature that incorporates affective-related risk is actually growing in health care (DeWit, Das, & Vet, 2008; Dunlop, Wakefield, & Kashima; 2008; Dunlop et al., 2010; Greene, Campo, & Banerjee, 2010) and natural hazard (Keller, Siegrist, & Gutscher, 2006; Xie, Wang, Zhang, Li,

& Yu, 2011) contexts. By inducing risk feelings through narrative stories, past experience and visual stimuli, some of these studies compare the effectiveness of different narrative formats (Dunlop et al., 2008), while the rest generally show that the affective risk component arouses greater risk perceptions (Dunlop et al., 2010; Greene et al., 2010; Keller et al., 2006; Xie et al., 2011) than messages containing a cognitive risk component manipulated by statistical evidence. However, studies yield mixed results for the effectiveness of affective related risk message on intentions: while DeWit et al. (2008) report that exposure to an affective-related risk message produces higher behavioral intentions, Dunlop et al. (2010) find there is no significant difference between narrative and advocacy messages on intentions. One possible explanation for this contradictory finding is that other variables moderate the relative persuasiveness of affective-related and cognitive-related risk messages. Epstein (1994) notes that the relative dominance of experiential system and analytical system largely depends on situational factors and individual thinking styles. However to date, few studies have explored the interaction between different risk components and individual personality traits, such as need for cognition and need for affect. This study will seek to address this gap in the literature by providing a more complete understanding of risk persuasion and practical implications for designing tailored health promotion messages in public health campaigns.

Matching effect: Need for Affect VS. Need for Cognition

Beyond the area of risk communication, studies show that the influence of affective content and cognitive content is moderated by individuals' processing styles – need for cognition (NFC) and need for affect (NFA) (Haddock et al., 2008; Mayer & Tormala, 2010; Ruiz & Sicilia, 2004). According to Cacioppo and Petty (1982), the need for cognition is

defined as an individual's tendency to engage in active and effortful cognitive activity.

Persuasion studies reveal that people who are high in need for cognition tend to process information more deliberately, generate more elaborations to informational messages, and demonstrate greater receptivity to factual information or cognitive appeals (Haddock et al., 2008; Mayer & Tormala, 2010). In contrast, the need for affect refers to the overall orientation for people to approach or avoid emotionally arousing contexts and activities (as cited in Haddock et al., 2008). Individuals who are affective oriented are more persuaded by messages with emotional appeals or affective cues (Haddock et al., 2008; Mayer & Tormala, 2010; Ruiz & Sicilia, 2004). In Mayer and Tormala's research (2010, study 2), the researchers find that this matching effect is due to processing fluency. When people receive information that matches their processing styles, they can understand these messages more easily, which further results in persuasiveness.

The matching effect has been applied in the contexts of advertising (Haddock et al., 2008; Ruiz & Sicilia, 2004) and altruism (Mayer & Tormala, 2010; Clarkson, Tormala, & Rucker, 2011) to examine attitude formation, attitude change, and counter-attitudinal resistance. For example, in study 1 of Haddock et al., (2008), the researchers present a message of a fictional beverage named Power-Plus with either an affective appeal (pleasant feelings after drinking this beverage) or a cognitive appeal (positive attributes about the drink) to participants. Consistent with the matching effect, the results show that individuals who are high in NFA show more favorable attitude towards the affective-based message, and those who are high in NFC show a more positive attitude towards the message emphasizing attributes.

Other studies, though not directly measuring individuals' processing styles, report a

similar matching effect between cognitive appeal vs. affective appeal and cognitive-based attitude vs. affective-based attitude. For example, Mayer and Tormala (2010) found that when participants are initially affective-oriented to blood donation, they exhibit greater behavioral intentions to donate blood after receiving a message with the “feel” frame rather than the “think” frame. In contrast, the opposite pattern emerged for participants with initial cognitive-orientations. Similarly, Clarkson et al. (2011) reveal that matched (vs. mismatched) attacks moderate the relationship between attitude certainty and attitude openness.

Despite the robust research on the matching effect, few studies have applied it to health and risk communication. More specifically, scholars overly concentrate on the matching effect’s impact on attitudes, intentions, and behaviors, but its influence on risk perception, a more proximal dependent variable in risk persuasion, has not yet been investigated. Based on the previous evidence for the matching effect, it stands to reason that the message containing an affective component risk should be more effective among those who are high in NFA, while a message containing a cognitive component risk should be more persuasive to those who are high in NFC.

Hypothesis

Previous research has shown strong effects of matching need for cognition versus affect to cognitive- versus affective-based message on individuals’ attitudes, intentions, and behaviors. However, rather than directly linking matched conditions to greater behavior changes, one might first expect a matching effect on individuals’ risk perception. As the RPA framework suggests risk perception is one of the predictors of an individual’s performance of risk-ameliorating behaviors. If one intends to avert risk, an individual needs to first possess

high risk perception. In addition, individuals process messages more fluently in a matched mode; as risk tends to represent a common attribute of the persuasive message, people will be more likely to understand a matched risk message and consequently perceive greater risk.

Therefore, this study hypothesizes that:

H1a: A message emphasizing cognitive-related risk (vs. affect-related risk vs. no message) will produce greater risk perception of getting cervical cancer among participants high (vs. low) in need for cognition.

H1b: A message emphasizing affect-related risk (vs. cognitive-related risk vs. no message) will produce greater risk perception of getting cervical cancer among participants high (vs. low) in need for affect.

Based on the above hypotheses that individuals who receive a matched risk message will also perceive greater risk, one could expect that these individuals will be more likely to fall into the responsive group proposed by the RPA framework, if self-efficacy and response efficacy beliefs are controlled equally high across all conditions. As the RPA framework predicts that the responsive group is the most ready to adopt risk-averse behaviors compared to the avoidance group, the indifference group and the proactive group, this study further hypothesizes:

H2a: A message emphasizing cognitive-related risk (vs. affect-related risk vs. no message) will produce more positive attitudes toward routine Pap smear tests among participants high (vs. low) in need for cognition.

H2b: A message emphasizing affect-related risk (vs. cognitive-related risk vs. no message) will produce more positive attitudes toward routine Pap smear tests among participants high

(vs. low) in need for affect.

H3a: A message emphasizing cognitive-related risk (vs. affect-related risk vs. no message) will produce greater change in intention to take routine Pap smear tests among participants high (vs. low) in need for cognition.

H3b: A message emphasizing affect-related risk (vs. cognitive-related risk vs. no message) will produce greater change in intention to take routine Pap smear tests among participants high (vs. low) in need for affect.

METHOD

This study was based on a between-groups online experiment. Participants were randomly assigned to one of three conditions (cognitive-related risk message vs. affective-related risk message vs. control message). Their processing styles (NFC & NFA) were measured as quasi-experimental factors in the study. The dependent variables were risk perception of cervical cancer, attitude toward and intention to have a Pap smear test in a certified hospital every three years.

Participants

The participants were domestic Chinese women ages 35 to 54 recruited through snowball sampling. This age range was selected for inclusion because women were at high risk of getting cervical cancer during this time period. The researcher asked friends and family members to forward the survey link to females who met age-eligibility criteria for the study. In addition, a recruitment message containing the same link was posted in the mailing list of the Chinese Students and Scholars Association at a Mid-western university in the U.S., asking receivers to invite older women to participate in the survey. As a reward, ten respondents were randomly drawn to win a 50-yuan phone card. A total of 286 participants clicked through the survey link. However, only 100 of them were valid respondents. Exclusion criteria required that participants who were missing on over 10% of the survey questions, not within the age range, took the survey multiple times, and did not read the message closely be removed from analysis.

Table 1 presents participant demographic information. The average age of the participants was 42.8 ($SD = 5.51$). The majority of the sample reported living in urban areas (91%), and were currently married or living with a partner (85%). Eighty five percent of the respondents

reported high levels of education, holding at least a post-secondary degree (which is equivalent to the bachelor degree in China). More than half of the participants indicated having had a Pap test in the past three years. One in five respondents also reported having a family history of cancer.

Table 1
Sample Characteristics

Measure	%	<i>M</i>	<i>SD</i>
Age		42.80	5.51
Education			
High school/Secondary school	15		
Bachelor	37		
Post-secondary	38		
Graduate	10		
Marriage/Committed relationship			
Yes	85		
No	15		
Residence			
Urban	91		
Rural	9		
Cancer history			
Yes	21		
No	79		
Pap smear test in the past 3 years			
Yes	58		
No	42		

Notes: N = 100

Procedure

Prior to launching the experiment, messages were pretested for quality and effectiveness of manipulation among 18 members of the target group. The messages were revised based on the feedback elicited through three rounds of pretesting during a pilot study. Based on a 5-point Likert scale, participants indicated that the cognitive-related risk message ($M = 3.67$, $SD = 1.07$) contained more statistics than the affective related message ($M = 2.83$, $SD = 1.04$), and that the affective-related message ($M = 3.41$, $SD = 1.42$) incorporated more emotional

language compared to the cognitive message ($M = 3.22$, $SD = 1.04$). Since the data were directionally consistent with the intended manipulation, the messages were used in the main study.

In the main experiment, participants first answered 10 items measuring their NFA and 18 items measuring their NFC. After that, 34 of the 100 participants were randomly assigned to read the cognitive-related risk message; 29 respondents were randomly exposed to the affective-related risk message, and the remaining 37 people received no message (Table 2). A manipulation check was used to measure whether participants noted the manipulated message factors immediately following exposure to the stimuli in the two message condition groups. Next, participants answered questions that measured the dependent variables. Efficacy was also measured as a control variable since it was a component that could influence protective behaviors, as suggested by the RPA framework. Finally, participants were asked to indicate their demographic information, thanked for their participation and inquired as to whether they wished to enter their email address in a draw to win a small gift.

Table 2
Message Conditions

Condition	%
Cognitive-related risk	34
Affective-related risk	29
Control	37
Total	100

Stimuli Material

Based on the premise of the RPA that identifies risk perception and efficacy as two predictors of self-protective behaviors, the messages included content capturing both elements (See Appendix A). The affective-related risk message and the cognitive-related risk only differed from each other in whether risk probability and severity were manipulated by

narratives or by facts. Because a narrative format message was especially effective for transporting feelings and emotions (Dunlop, Wakefield, & Kashima, 2008), it should be an appropriate form to manipulate affective-related risk. Drawing from exemplification theory (ET) (Zillman, 1999), exemplars and testimonies were utilized as the main technique to create the narrative message. In contrast, the cognitive-related risk message stressed the objective symptoms and statistics of getting cervical cancer. These techniques were adopted by See, Petty and Fabriger (2008) to create a cognitive-based message, and also used in the present study.

Because the participants were Chinese, the messages were back-translated into Chinese (Brislin, 1970). The researchers first translated the English versions of questionnaires and stimulus materials into Chinese. An independent Chinese international student then translated the Chinese materials back to the original source language. The translation disparities were resolved by the researcher and the bilingual translator collaboratively.

Manipulation Check

A manipulation check was used to ensure participants perceived the message manipulation as intended. In particular, participants who read the cognitive-related risk message should be more likely to recall cervical cancer statistics at a higher rate than those who read the affective-related risk message. By contrast, participants who received the affective-related risk message should self-report higher level of emotional arousal, and be more likely to self-report remembering more emotional language describing cervical cancer compared to their counterparts exposed to the cognitive-related risk message. In particular, emotional arousal was measured by a 9-point subscale of the Self-Assessment Manikin (SAM) (Bradley & Lang,

1994). SAM has strong convergent validity and is highly correlated with the semantic differential scale (as cited in Bradley & Lang, 1994) that measures participants' emotional arousal and valence toward affective pictures (Bradley & Lang, 1994). Additionally, this scale has been shown to operate well as a cultural-free measurement of emotional response (Morris, 1995), and thus it could be used to measure Chinese women's emotional arousal toward affective-related and cognitive-related risk messages. Additionally, a false item that measured the self-report recall of a visual image of women providing cervical cancer information was utilized to filter invalid questionnaires. With exception of emotional arousal, each item in the manipulation check used a 7-point scale ranging from "1 = *I definitely don't remember that*" to "7 = *I definitely remember that*".

Measures

With the exception of questions assessing demographic information and attitude, all items were measured using a 7-point Likert-type scale with "1 = *strongly disagree*" to "7 = *strongly agree*".

Demographic Characteristics. Participants were asked to self-report their age, education, residence (rural vs. urban), marital status, family history of cancer, and past history of routine cervical cancer screening.

Need for affect. Appel, Gnam, and Maio's (2012) Need for Affect scale contains 10 items that measure an individual's tendency to approach and avoid emotion. Past research has treated this scale in three ways. See et al. (2008) subtracted the avoidance subscale from the approach subscale. However, the reliability of the approach subscale ($\alpha = .68$) and the avoidance subscale ($\alpha = .80$) were inconsistent in this study. Additionally, scholars have also combined

the approach subscale and the reversed avoidance subscale (Haddock et al., 2008) or only used the approach subscale as measurement for NFA (Appel & Richter, 2010). Nevertheless, in the present study the approach subscale and the recoded avoidance subscale cross loaded on two dimensions, indicating the combined scale measured two facets of NFA. Since the reflected avoidance subscale explained greater variance of the outcomes than the approaching subscale in later analysis, this study adopted the avoidance subscale. Sample items included “If I reflect on my past, I see that I tend to be afraid of feeling emotions” and “I find strong emotions overwhelming and therefore try to avoid them”.

Need for cognition. The present study adopted the 18-item Need for Cognition scale developed by Cacioppo, Petty, and Kao (1984). Although previous research reported a good reliability of this scale ($\alpha = .88$; Cacioppo et al., 1984), Levine (2005) argues that reliability alone is not a sufficient indicator of scale validity. According to Levine (2005), factor structure is also essential to validate an instrument as a multidimensional scale measures different constructs. However, Lord and Putrevu (2006) find the NFC scale contains four dimensions. Consistent with their findings, an exploratory factor analysis of participants’ scores on NFC revealed the scale was loaded on four factors in the current study. Since only four items attained high loadings on a single dimension, the remaining items were deleted from the analysis. Sample items retained were “Thinking is not my idea of fun” and “I only think as hard as I have to”. This 4-item unidimensional scale was internally reliable with an alpha coefficient of .88.

Risk perception of getting cervical cancer. Risk perception was measured by four modified items extracted from Rimal and Juan (2010). In their study, risk perception was calculated by averaging perceived susceptibility and perceived severity. Borrowing their measures, the items

of susceptibility were “Compared to most people my age, I understand that my risk of getting cervical cancer is high” and “The likelihood of my getting cervical cancer is high”. The items on severity were “Cervical cancer is a serious disease that can kill” and “Cervical cancer is more deadly than most people realize”.

Efficacy. The scale used to measure efficacy was adopted from three items of response efficacy and three items of self-efficacy developed by Witte, Meyer and Martell (2001). Although Witte et al. (2001) suggest calculating efficacy by using the product of averaged response efficacy and self-efficacy, previous RPA studies have computed efficacy as the average of response efficacy and self-efficacy. To be consistent with past studies using the RPA framework, this study adopted the second calculation. A sample item of response efficacy was “Having Pap smear tests every three years at a certified hospital works in detecting cervical cancer”; and a sample item for self-efficacy was “I am able to have a Pap smear test every three years at a certified hospital to detect cervical cancer”. The reliability was .76 for response efficacy and .85 for self-efficacy.

Attitude. Six 7-point semantic items from a study by Orbell, Hagger, Brown and Tidy (2006) were used to assess participants’ attitude toward having Pap smear tests every three years. They were wise–unwise, important–unimportant, worthwhile–not worthwhile, necessary–unnecessary, good– bad, useful– of no use, with 1 indicating the negative pole and 7 indicating the positive pole. Two dimensions (i.e., unpleasant-pleasant, unsatisfying-satisfying) from the original scale were eliminated in the present study due to lack of relevance. While the reliability of the original scale is .74 (Orbell et al., 2006), the modified scale used in this study showed stronger internal validity ($\alpha = .98$).

Intentions. Four items from Orbell et al. (2006) were adapted to measure participants' willingness to take Pap smear tests every three years. A sample item was illustrated by the following: "How likely is it that you will take a Pap smear test in a certified hospital at a three-year interval?" The reliability of this scale was above the acceptable threshold, with an alpha coefficient of .87 reported by Orbell et al. (2006) and .94 in the current study.

Table 3 describes the primary variables across different groups.

Table 3

Primary variables for Different Conditions

Variable	Cognitive-related risk (<i>n</i> = 34)		Affective-related risk (<i>n</i> = 29)		Control group (<i>n</i> = 37)	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Need for affect	4.13	1.10	3.84	1.24	4.14	1.15
Need for cognition	4.14	1.10	4.17	0.98	4.22	1.17
Risk perception	3.51	0.96	3.72	1.19	3.70	0.98
Efficacy belief	5.07	1.24	5.13	1.07	5.35	0.93
Attitude	6.15	1.55	6.79	0.74	6.56	0.86
Intention	5.39	1.41	5.50	1.42	5.64	1.06

Statistical Analysis

Three hierarchical multiple regressions were conducted to examine the hypotheses proposed in this study. Demographic characteristics including education, marital status, residence, past Pap smear test behavior, and family history of cancer were dummy coded and entered in the first block. In the second block, efficacy belief was entered as a control variable. In the third block, message condition was added as a dummy variable filtering out the control condition, and processing styles were included in the fourth block. Finally, interaction terms of dummy coded message conditions and centered processing styles were created and entered into the last block. In addition, following the guidelines of Cohen, Cohen, West and Aiken (2003), the means of all the primary continuous independent variables were mean-centered prior to

entering them in the. The outcomes of interest were risk perception, attitude, and intention.

RESULTS

Manipulation Check

Sixteen participants were dropped from the analysis due to their answers on the false item (i.e., they recalled seeing a picture when the stimuli only contained text). Three one-way ANOVAs were performed to compare means of the two experimental conditions on emotional arousal, and recall of statistics and emotional language. The results show that the difference of recalling statistics related to the risk of getting cervical cancer was not statistically significant between participants in the cognitive-related risk message condition ($M = 3.29$, $SD = 1.73$) and participants in the affective-related risk message condition ($M = 3.72$, $SD = 1.33$), $F(1, 61) = 1.17$, $p = .28$, two-tailed. In addition, participants in the affective-related risk message condition ($M = 4.17$, $SD = 2.44$) did not report more emotional arousal than their counterparts in the cognitive-related risk message condition ($M = 3.90$, $SD = 2.30$), $F(1, 61) = 0.20$, $p = .65$, two-tailed. However, participants who read the affective-related message ($M = 4.07$, $SD = 1.49$) reported greater recall of emotional language than those who were exposed to the cognitive-related message ($M = 3.47$, $SD = 1.58$), although this difference does not reach statistical significance, $F(1, 61) = 2.37$, $p = .13$, two-tailed.

Correlations

Table 4 shows the Pearson correlations between the primary variables. Specifically, in line with previous studies (Bruijin, Keer, Putta, & Neijens, 2012), the two processing styles - NFC and NFA were positively associated, $r(98) = .37$, $p < .001$. Efficacy belief was also positively associated with attitude [$r(98) = .51$, $p < .001$] and intention [$r(98) = .75$, $p < .001$] respectively. Attitude and intention were also positively correlated, $r(98) = .63$, $p < .001$. Risk perception was not significantly associated with any other primary variables.

Table 4
Correlation Matrix of Primary Variables

Variable	1	2	3	4	5	6
1. Need for affect	-					
2. Need for cognition	.37***	-				
3. Risk perception	-.11	-.19	-			
4. Efficacy belief	-.08	.03	.06	-		
5. Attitude	.08	-.05	.11	.51***	-	
6. Intention	.02	-.04	.04	.75***	.63***	-

*** $p < .001$

ANOVA

Prior to the hypothesis testing, three analysis of variance (ANOVA) tests were performed to compare the mean differences of risk perception, attitude, and intention among the three groups. Results revealed there were no statistical differences across the three conditions in terms of risk perception [$F(2, 97) = .351, p = .705, \eta^2 = .007$], attitude [$F(2, 97) = 2.703, p = .072, \eta^2 = .052$], and intention [$F(2, 97) = .335, p = .716, \eta^2 = .007$] respectively. Although participants in the affective-related risk message condition reported higher means on attitude as presented in Table 3, further post hoc comparisons using Tukey's HSD test at $p < .05$ showed that the affective-related risk message condition did not significantly differ from the control condition and the cognitive-related risk message condition. Additionally, although participants in the control condition reported higher means on intention, post hoc comparisons using Tukey's HSD test at $p < .05$ demonstrated that their differences between the affective-related risk message condition, and between the cognitive-related risk message condition were not significant.

Hypothesis testing

Table 5 summarizes the results for the hierarchical linear multiple regression analyses. The results revealed that the overall models significantly predicted attitude [$F(15, 85) = 2.708, p$

= .003, adjusted $R^2 = .232$] and intention [$F(15, 85) = 7.570, p < .001$, adjusted $R^2 = .537$], but not risk perception [$F(15, 85) = 0.645, p = .872$, adjusted $R^2 = -.067$].

Table 5

Summary of Hierarchical Regressions to Test the Interaction Effects of Risk messages and Processing styles on Risk Perception, Attitude, and Intention

Variables	Risk perception		Attitude		Intention	
	β	t	β	t	β	t
Block 1						
Age	-0.105	-0.802	-0.138	-1.236	-0.033	-0.381
Education (ref = High/Secondary school)						
Post-secondary school	0.269	1.503	-0.298*	-1.964*	0.130	1.104
College	0.187	0.968	-0.167	-1.021	0.115	0.901
Graduate	0.108	0.685	-0.008	-0.059	0.151	0.901
Urban (ref = Rural)	0.161	1.297	-0.024	-0.232	0.067	0.823
Married/Committed (ref = no)	0.138	1.138	0.079	0.772	-0.029	-0.364
Family cancer history (ref = no)	-0.019	-0.157	-0.019	-0.185	-0.201*	-2.580*
Pap smear in the past 3 years (ref = no)	-0.076	-0.539	0.208*	1.739*	0.306**	3.295**
Block 2						
Efficacy belief	-0.025	-0.186	0.373**	3.294**	0.526***	5.972***
Block 3						
Cognitive-related risk message	-0.091	0.671	-0.161	-1.407	-0.063	-0.705
Affective-related risk message	0.001	0.009	0.193*	1.731*	0.046	0.530
Block 4						
Need for cognition (NFC)	-0.079	-0.514	-0.069	-0.532	-0.053	-0.522
Need for affect (NFA)	-0.096	-0.649	0.302*	2.402*	0.065	0.668
Block 5						
NFC $\times$ Cognitive-related risk message	-0.050	-0.350	-0.048	-0.400	-0.084	-0.892
NFA $\times$ Affective-related risk message	-0.075	-0.506	-0.253*	-2.014*	0.069	0.705

Notes: * $p < .05$; ** $p < .01$; *** $P < .001$

Secondary-school, Pap smear in the past 3 years, and affective-related risk message marginally predict attitude

H1a predicted that participants who were higher in NFC would report higher perceived risk of getting cervical cancer than those who were lower in NFC when exposed to a cognitive-related risk message. Results showed that the product of cognitive-related message and NFC in the final block did not significantly predict risk perception, $\beta = -0.050$, $t = -0.350$, $p = .727$, two-tailed. The results are not consistent with predictions of hypothesis 1a.

In H1b, an interaction effect of NFA and affective-related risk message on the risk perception of getting cervical cancer was proposed. However, the interaction term of affective-related risk message and NFA was not a statistically significant predictor of risk perception ($\beta = -0.075$, $t = -0.506$, $p = .615$, two-tailed), suggesting H1b was also not supported.

H2a predicted that those who were higher in NFC would demonstrate more positive attitude toward taking routine Pap smear test than participants who were lower in NFC when exposed to a cognitive-related risk message. The beta-value for $\text{NFC} \times \text{cognitive-related message}$ did not reach statistical significance, $\beta = -0.048$, $t = -0.400$, $p = .691$, two-tailed. H2a was not supported.

H2b hypothesized that when presented with an affective-related message, participants high in NFA would show a more favorable attitude toward taking a routine Pap smear test compared to their counterparts low in NFA. The results showed that the interaction between NFA and affective-related risk message condition significantly predicted attitude, $\beta = -0.253$, $t = -2.014$, $p = .048$, two-tailed. The direction of the interaction was such that among participants high in NFA, the association between exposure to an affective-related risk message and attitude was strengthened. This result was consistent with H2b.

The expectation of H3a was that participants high in NFC would show greater intention to take a routine Pap smear test than those low in NFC when exposed to a cognitive-related message. However, the interaction term of NFC $\times$ cognitive-related risk message in the final block was not a significant predictor of intention ($\beta = -0.084$, $t = -0.892$, $p = .375$, two-tailed), suggesting H3a was not supported.

H3b proposed an interaction effect of NFA and affective-related risk message on intention to take a routine Pap smear test. However, results showed that an NFA $\times$ cognitive-related message was not a significant predictor of intention ($\beta = 0.069$, $t = 0.705$, $p = .483$, two-tailed), and did not provide evidence in support of this hypothesis. Thus, H3b was inconsistent with observed results.

In addition to the main hypothesis, the results also revealed other variables that predicted attitude toward and intention to have Pap smear tests. In terms of attitudes, a hierarchical regression test showed that past behavior ($\beta = 0.208$, $t = 1.739$, $p = .086$, two-tailed), post-secondary education ($\beta = -0.298$, $t = 1.964$, $p = .054$, two-tailed), and efficacy belief ($\beta = 0.373$, $t = 3.294$, $p = .002$, two-tailed) were significant predictors. That is, participants who took a Pap smear test in the past three years and who had stronger efficacy belief had a more favorable attitude toward having a Pap smear test every three years. Those who had a secondary-school education background exhibited less favorable attitude. Additionally, the results indicated that family history of cancer ($\beta = -0.201$, $t = -2.580$, $p = .012$, two-tailed), past behavior ($\beta = 0.306$, $t = 3.295$, $p = .002$, two-tailed), and efficacy belief ($\beta = 0.526$, $t = 5.972$, $p < .001$, two-tailed) significantly predicted intention to have a routine Pap smear test.

Participants who had already engaged in Pap smear testing in the past three years and reported

stronger efficacy belief indicated greater intention to have routine cervical cancer screening in the future. However, women who had a family history of cancer had lower intention to take the recommended Pap smear tests every three years.

DISCUSSION

This study tested the effectiveness of tailoring affective-related vs. cognitive-related risk messages to NFA vs. NFC regarding taking a routine Pap smear test. Overall, the results only provided limited evidence for tailoring messages in these conditions. The most robust finding was observed for the interaction effect of affective-related risk message and NFA on attitude. That is, when presented with an affective-related risk message, women high in NFA were more likely to show more positive attitude toward routine Pap smear screening. However, the same interaction effect did not occur to shape participants' risk perception and intention. Also, the interaction between the cognitive-related risk message and NFC failed to predict any of the dependent variables. Women higher in NFC did not demonstrate higher risk perceptions of getting cervical cancer, more favorable attitudes toward, and greater intentions to have Pap smear screening compared to those who reported lower NFC when exposed to a cognitive-based risk message.

The present study partially supported the matching effect between a cognitive-related appeal and NFC and between an affective-related appeal and NFA (Haddock, Maio, Arnold, & Huskinson, 2008; Mayer & Tormala, 2010; Ruiz & Sicilia, 2004). Along with previous research about the interaction effect between NFA and affective-related stimuli, this study showed that when Chinese women high in NFA read a narrative story about the risk of getting cervical cancer, they reported a more positive attitude toward having a routine Pap test. However, inconsistent with the same thread of studies, the pattern was not observed when Chinese women high in NFC read statistic-based information about cervical cancer. The current study further contrasted with past literature in that processing styles did not interact

with risk messages on affecting behavioral intention.

Moreover, results of the current study shed light on whether the use of an affective- or cognitive-related risk message was more effective, although this research question was not proposed. Corresponding with findings demonstrating the relative advantage of narratives (DeWit et al., 2008; Conner et al., 2011), this study revealed a main effect of the affective-related risk message on attitude. According to transportation theory (Green, 2005), the persuasiveness of the narrative story may be explained by its ability to establish a connection between audience and the character, provide plausible and concrete examples, and facilitate mental imagery. It is possible that the vivid story first immersed participants into the situation of the cancer victim, and the follow-up efficacy information about the effectiveness of routine screening eased participants' negative affect and thus elicited a positive attitude. Additionally, the ineffectiveness of the statistical message might be partially due to the weak manipulation (the score on the recall of statistics is lower than the mid-point).

One noticeable result was that the messages and their interactions with processing styles exerted limited effects on risk perception. The overall model did not significantly predict participants' risk perception. Additionally, the means of risk perception were below the mid-point of the scale across the three groups, indicating low risk perception of getting cervical cancer. There are two possibilities for these results. The first interpretation is based on the observation that participants had relatively high percentages of having a routine Pap smear test (58%). Since they have already engaged in the recommended behavior, early detection and the positive feedback from the screening may have attenuated their perceived susceptibility of getting cervical cancer. Another explanation is that since most participants did not report

having a family history of cancer (75%), they may have felt a lower genetic risk of developing cancer.

This study also provided partial support for the RPA framework. Although the RPA framework ordered the four attitudinal groups in terms of positive outcomes (Turner et al., 2006), previous studies demonstrated mixed evidence for the relative advantage of the responsive group over the proactive group. For example, while Rimal and Real (study 2; 2003) revealed that there was no significant difference between proactive and responsive groups in seeking information about skin cancer, using sunscreen, and self-inspecting for moles and skin discolorations in a survey; the experiment conducted by Turner et al. (2006) showed that compared to the proactive group, members in the responsive group were more likely to engage in preventive behaviors related to skin cancer. Furthermore, this framework acknowledged that both proactive and responsive groups were desirable. That is, among those with high perceived risk status, individuals were motivated to avoid risk, and their strong efficacy played an important role in building confidence and producing risk-reducing actions; among those with low risk perception, efficacy belief encouraged individuals to initiate health practices with the goal of staying healthy (Rimal & Real, 2003; Turner et al., 2006). Likewise, a meta-analysis on fear appeals also found that efficacy beliefs led to positive attitude and behavior change (Witte & Allen, 2000). In this study, the participants could be segmented into the proactive group as they exhibit strong efficacy belief and low risk perception. Aligned with past literature on the effectiveness of efficacy and the favorable health outcome exhibited by a proactive group, this study showed that efficacy belief was an important predictor for attitude and intention to have a routine Pap smear test. In addition, the fact that in the absence of risk perception, individuals

with strong efficacy belief could still possess strong intention to have a routine Pap smear test corresponded to the research of Turner, Skubisz, and Rimal (2011). These scholars argue that certain behaviors could be more or less driven by risk perception or efficacy belief given different features of disease and contexts of practicing health behaviors. It is possible that the cancer screening program in China educates urban Chinese women well about the benefits of Pap smear testing and provides great convenience for them to engage in routine Pap smear testing. The strong efficacy beliefs further drive the participants of this study to have cervical cancer screenings.

This study contains several limitations. The primary weakness is the failure of the message manipulation. Compared to the group exposed to the affective-related risk message, participants who read the cognitive-related risk message did not recall more statistical information about the risk of getting cervical cancer. Although the manipulation of the affective-related message was slightly more successful and trending in the expected direction, with participants remembering more emotional languages than those in the cognitive-related group, the difference in recall did not reach a significant level. One interpretation for this may relate to the wording of the manipulation check item. The question that assessed the cognitive component of the message asked whether participants remembered the number associated with the risk of getting cervical cancer. However, it is possible that respondents may have remembered the high susceptibility and severity but not the exact statistics. While the item intended to evaluate whether the participants perceived the stimuli as containing statistics and facts, the wording may have confused participants and led to the unsatisfactory results of the manipulation check.

Another limitation of this study relates to its non-representative sample. Because the respondents were reached through the invitation from the researcher's friends and family, the sample may not be representative of Chinese women from different segments of the broader population. In fact, the demographic information showed that the majority of the participants were from urban areas, were likely to be affluent, and well-educated. It is likely that city residents have more access to medical resources than rural citizens, and people with higher levels of education are more health conscious, more skilled in performing health behaviors, and tend to seek and understand more health information. Therefore, it is unsurprising that women in this sample reported a high rate of cervical cancer screening.

Additionally, this study exclusively focused on Chinese women. It is unclear whether the interaction effect between processing styles and risk messages can be observed in women from other culture. Also, only health behavior was examined and it is not clear how long the results after message exposure. Future research can examine the interaction effect in an alternative behavior context and investigate its impact on attitude strength.

Despite these weaknesses, this study also has significant advantages and implications. Instead of using college students, this study collected data from older Chinese women, a population that suffers from a greater rate of cervical cancer.

As mentioned before, China's Ministry of Health has launched a nationwide program to provide free cervical cancer screening, and there remains room for health care professionals to educate the public about gynecological health. Since the present study tests a promising way to encourage Chinese women to take routine Pap smear tests, the Ministry of Health of China might apply it to design health campaigns as a complementary way to promote the screening

program. Health care practitioners can produce narrative messages embedding vivid personal experience, emotions, and affect that are associated with getting cervical cancer to improve women's attitude toward having a routine Pap smear test. The persuasiveness of such narrative messages will be further enhanced if they are broadcast on entertainment media. According to Green and Clark (2012), entertainment media is especially effective in transporting audiences into a narrative world.

Additionally, this study only used text-based factors to manipulate affective- and cognitive-related risk messages. Future research can investigate whether visual stimuli will lessen or enhance the matching effect on people's risk perception and attitude. To date, the relative effectiveness of verbal and visual stimuli is rather conflicted. While there are studies showing the comparative effectiveness of words and pictures (Tukachinsky, Mastro, & King, 2011), other research demonstrates that a visual format elicits stronger association between a hazard and an undesirable outcome, and thus motivates greater risk avoidant behavior change (Chua, Yates, & Shah, 2006); there is also research indicating a word is worth a thousand pictures because visual cues are ineffective in expressing abstract concepts (Doumont, 2002) and multivariate relationships of risks (Parrott, Silk, Dorgan, Condit, & Harris, 2005). Additionally, the redundancy effect suggests that consistency between verbal and visual cues can increase message recall, comprehension (Parrot et al., 2005), and perceived message effectiveness. However, it is unclear how this redundancy effect impacts individuals' risk perception and preventive behaviors.

Future research might also test the matching effect of message appeal and individuals' subjective evaluations of whether they are cognitively- or affectively- driven. According to See

et al., (study 1 & 2; 2008), individuals' perceptions of their processing style are distinctive from their objective processing styles. In addition to the matching effect between message appeal and objective processing style, they observed that matching message appeal to subjective perceptions of processing style explained extra variance in individuals' attitude towards blood donation. Therefore, future studies might investigate whether individuals' subjective evaluations of their processing styles impact risk perceptions, attitude, and intentions; and whether actual or perceived processing styles better predict the persuasion outcome.

In conclusion, the current study suggests promising effects of affective-related messaging and its interaction with NFA on influencing women's positive attitude towards having a routine Pap smear test in a certified hospital, a proxy to intention and actual behavior. The findings here suggest that it may be worthwhile for future scholars to replicate the findings in other health and risk communication contexts, test the boundaries of affective-related and cognitive related risk messages, and advance knowledge in tailoring messages to individual differences.

APPENDICES

Appendix A: Message Manipulation

Cognitive-related Risk:

Cervical cancer imposes great health hazards to Chinese women's health because of their vulnerability and risk for severe outcomes. **A Chinese woman between the ages of 35-54 has a 20-30% chance of contracting Human papillomavirus virus (HPV); and the high-risk HPV types are the most direct cause of cervical cancer (99.6% percent of cervical cancer is caused by HPV). For those who contract the virus, the incidence rate of cancer is 40%. In the early stages of cervical cancer, its symptoms are merely invisible. However, for more advanced cervical cancer, its symptoms include abnormal vaginal bleeding between periods, after intercourse, or after menopause, pelvic pain, loss of appetite, and weight loss. Moreover, for advanced cervical cancer, the cancer cells can spread to tissues next to the cervix or even outside of the pelvis.**

However, despite the possibility of dreadful outcomes of cervical cancer, cervical cancer is almost 100% treatable when it is still in its early stage. It starts as a precancerous condition and it can take years for such a condition to turn into cervical cancer. Getting regular Pap smears can help detect precancerous changes, which can be treated before they turn into cervical cancer. Pap smears effectively identify such changes, but they must be done regularly. Physicians recommend that women ages 40-54 should have a Pap smear test every three years in certified hospitals. The cost for a Pap smear test is affordable, and ranges from 100 to 150 Yuan depending on different areas. Also, women ages 25 to 65 are qualified to participate in free cervical cancer screenings supported by the government. This program has been launched in cities, such as Shanghai, Beijing, Fuzhou, Shenyang, Guangzhou and Wuhan.

Affect-related Risk:

Cervical cancer imposes great health hazards to Chinese women's health because of their vulnerability and risk for severe outcomes. **Mrs. Chen, a 45-year-old Chinese woman, is a mid-stage cervical cancer patient. Before diagnosis, she lived like any ordinary women on the street. She had read some coverage about cervical cancer, but Mrs. Chen didn't believe an ordinary person like herself would get the cancer. It was not until the summer of 2011 that she went to see the doctor because of a pain in her abdomen over the past several months. After several weeks of examination, she was diagnosed with cervical cancer. Only then did she know that a woman between the age of 30 and 50 has a high possibility to get cervical cancer; some of her friends even know several cervical cancer patients. Mrs. Chen's situation is not optimistic: she feels that her abdomen is hard and hurts like a swelling balloon when she sits down. Her blood flows out of her body every now and then. Even though Mrs. Chen tries to eat, she always feels like something is stuck in her chest and vomits everything. She worries that the scary cancer cells have already travelled all over her body...**

However, despite the possibility of dreadful outcomes of cervical cancer, cervical cancer is almost 100% treatable when it is still in its early stage. It starts as a precancerous condition and it can take years for such a condition to turn into cervical cancer. Getting regular Pap smears can help detect precancerous changes, which can be treated before they turn into cervical cancer. Pap smears effectively identify such changes, but they must be done regularly. Physicians recommend that women ages 40-54 should have a Pap smear test every three years in certified hospitals. The cost for a Pap smear test is affordable, and ranges from 100 to 150

Yuan depending on different areas. Also, women ages 25 to 65 are qualified to participate in free cervical cancer screenings supported by the government. This program has been launched in cities, such as Shanghai, Beijing, Fuzhou, Shenyang, Guangzhou and Wuhan.

Appendix B: Message Manipulation (Chinese Translation)

认知风险诉求

宫颈癌是一种发病率高和危害大的恶性癌症。它对中国女性的健康构成了巨大威胁。一名 35 至 54 岁的中国女性有 20%至 30%的几率接触人乳头状瘤病毒(HPV)——该病毒的高危亚种是宫颈癌的直接诱因 (99.6%的宫颈癌由 HPV 病毒感染引起); 一名感染到 HPV-16 或 HPV-18 的女性有 70%的几率罹患宫颈癌。宫颈癌早期多无症状; 其中期临床症状包括非经期内、性交后或绝经后阴道非正常出血、小腹疼痛、食欲不振、消瘦等。晚期宫颈癌的症状还体现为癌细胞阻塞尿道甚至扩散到其它身体组织。

然而, 尽管宫颈癌发病率高危害大, 其在发病早期是可以完全治愈的。从最初的宫颈癌前病变发展为宫颈癌需要 10 年时间。如果我们能探测宫颈癌前病变, 并且在其发展成宫颈癌前进行治疗, 那么宫颈癌是可以预防和治愈的。从这个角度来看, 宫颈癌并不可怕。探测及确认宫颈癌前病变的关键是进行定期子宫颈抹片检查。妇科医生建议 35 至 54 岁的女性需要每隔三年到正规医院进行子宫颈抹片检查。子宫颈抹片检查的价格大致为 100 至 150 元, 这对一般人是可以承受得起的。除此之外, 年龄在 25 岁至 65 岁的女性还可以参加政府推进的免费宫颈癌筛查项目。该项目目前在上海、北京、广州、福州、武汉和沈阳等地开展。

情感风险诉求

宫颈癌是一种发病率高和危害大的恶性癌症。它对中国女性的健康构成了巨大威胁, 而 45 岁的陈女士正是一名宫颈癌中期患者。在确诊之前, 陈女士就像大街上任何一个普通女人那样生活着。她看过关于宫颈癌的报道, 但从不认为自己这样的普通人会得癌

症。直到 2011 年夏，她因为好几个月断断续续的小腹胀痛到医院看病。几周的检查后，医生诊断陈女士为宫颈癌。后来她才知道原来一名 30 多到 50 多岁女人患病的可能性相当高；自己圈子里朋友甚至都认识好几个病友。陈女士的病情不容乐观：她坐下的时候觉得小肚子发硬胀痛得有颗膨胀的气球，还频频流血。尽管陈女士尽量逼迫自己进食，但总觉得胸口像被什么东西堵住，怎么也咽不下饭菜，吃的东西还常常会被呕出来。她也时时担心癌细胞会不会已经扩散……

然而，尽管宫颈癌发病率高危害大，其在发病早期是可以完全检测和治愈的。从最初的宫颈癌前病变发展为宫颈癌需要 10 年时间。如果我们能探测宫颈癌前病变，并且在其发展成宫颈癌前进行治疗，那么宫颈癌是可以预防和治愈的。从这个角度来看，宫颈癌并不可怕。探测及确认宫颈癌前病变的关键是进行定期子宫颈抹片检查。妇科医生建议 35 至 54 岁的女性需要每隔三年到正规医院进行子宫颈抹片检查。子宫颈抹片检查的价格大致为 100 至 150 元，这对一般人是可以承受得起的。除此之外，年龄在 25 岁至 65 岁的女性还可以参加政府推进的免费宫颈癌筛查项目。该项目目前在上海、北京、广州、福州、武汉和沈阳等地开展。

Appendix C: Questionnaire

Please indicate how much you agree with following agreements (1 = “Strongly disagree”, 7 = “Strongly agree”).

1. I feel that I need to experience strong emotions regularly.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

2. Emotions help people to get along in life.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

3. I think that it is important to explore my feelings.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

4. It is important for me to be in touch with my feelings.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

5. It is important for me to know how others are feeling.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

6. If I reflect on my past, I see that I tend to afraid of feeling emotions.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

7. I find strong emotions overwhelming and therefore try to avoid them.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

8. I would prefer not to experience either the lows or highs of emotions.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

9. I do not know how to handle my emotions, so I avoid them.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

10. Emotions are dangerous – they tend to get me into situations that I would rather avoid.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

11. I would prefer complex to simple problems.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

12. I like to have the responsibility of handling a situation that requires a lot of thinking.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

13. Thinking is not my idea of fun. (recode)

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

14. I would rather do something that requires little thought than something that is sure to challenge my thinking abilities. (recode)

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

15. I try to anticipate and avoid situations where there is likely chance I will have to think in depth about something. (recode)

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

16. I find satisfaction in deliberating hard and for long hours.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

17. I only think as hard as I have to. (recode)

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

18. I prefer to think about small, daily projects to long-term ones. (recode)

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

19. I like tasks that require little thought once I've learned them. (recode)

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

20. The idea of relying on thought to make my way to the top appeal me.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

21. I really enjoy a task that involves coming up with new solutions to problems.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

22. Learning new ways to think doesn't excite me very much. (recode)

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

23. I prefer my life to be filled with puzzles that I must solve.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

24. The notion of thinking abstractly is appealing to me.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

25. I would prefer a task that is intellectual, difficult, and important to one that is somewhat important but does not require much thought.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

26. I feel relief rather than satisfaction after completing a task that required a lot of mental effort.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

27. It's enough for me that something gets the job done; I don't care how or why it works.

(recode)

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

28. I usually end up deliberating about issues even when they do not affect me personally.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

Participants will then read either an affective-related message, or a cognitive-related message, or no message.

Please indicate the number that best represents your answer (“1 = I definitely don’t remember that” to “7 = I definitely remember that”).

29. I remember the statistics about the risk of getting cervical cancer.

I definitely don’t remember that 1 2 3 4 5 6 7 I definitely remember that

30. I remember the symptoms of getting cervical cancer.

I definitely don’t remember that 1 2 3 4 5 6 7 I definitely remember that

31. I remember how the women’s emotional languages that portray cervical cancer.

I definitely don’t remember that 1 2 3 4 5 6 7 I definitely remember that

32. I remember the image of the women in the message.

I definitely don’t remember that 1 2 3 4 5 6 7 I definitely remember that

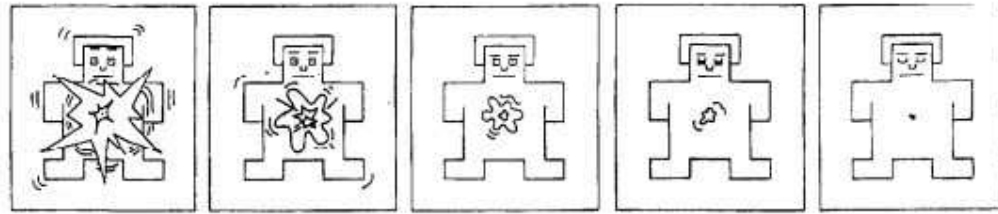
33. I remember the effectiveness of having Pap smear test.

I definitely don’t remember that 1 2 3 4 5 6 7 I definitely remember that

34. I remember how to getting a Pap smear test.

I definitely don’t remember that 1 2 3 4 5 6 7 I definitely remember that

35. Which figure (or the place between any two figures) best expresses your current emotional status:



1 2 3 4 5 6 7 8 9

Please indicate the number that best represents your answer (“1 = strongly disagree”, “7 = strongly agree”).

36. Compared to most people at my age, I understand that my risk of getting cervical cancer is high.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

37. The likelihood of my getting cervical cancer is high.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

38. Cervical cancer is a serious disease that can kill.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

39. Cervical cancer is more deadly than most people realize.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

40. Having a Pap smear test every three years at a certified hospital is effective in detecting cervical cancer.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

41. Having a Pap smear test every three years at a certified hospital works in detecting cervical

cancer.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

42. If I have a Pap smear test every three years at a certified hospital, I am less likely to get cervical cancer.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

43. Having a Pap smear test every three years at a certified hospital is convenient.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

44. Having a Pap smear test every three years at a certified hospital is easy.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

45. I am able to have a Pap smear test every three years at a certified hospital to detect cervical cancer.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

46. For me, to have a Pap smear test every three years at a certified hospital is:

Foolish 1 2 3 4 5 6 7 Wise

Unimportant 1 2 3 4 5 6 7 Important

Not worthwhile 1 2 3 4 5 6 7 Worthwhile

Unnecessary 1 2 3 4 5 6 7 Necessary

Bad 1 2 3 4 5 6 7 Good

Of no use 1 2 3 4 5 6 7 Useful

47. It is useful to have Pap smear test every three years at a certified hospital.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

48. I plan to attend a Pap smear test every three years at a certified hospital.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

49. I intend to attend a Pap smear test every three years at a certified hospital.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

50. I will attend to a Pap smear test every three years at a certified hospital.

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

51. How likely is it that you will attend your Pap smear test every three years at a certified hospital?

Strongly disagree 1 2 3 4 5 6 7 Strongly agree

52. Age (Numerical Value): _____

53. What is your education level?

- a. Primary School
- b. Middle School
- c. High School
- d. Secondary School
- e. Bachelor
- f. Bachelor
- g. Post-secondary
- h. Master
- i. Doctor/Post-Doctor

54. Where is your residence?

- a. Rural
- b. Urban

55. What is your marriage status?

- a. Married
- b. Single
- c. Divorced
- d. Unmarried couple/Living together
- e. Seperated
- f. Widowed

56. Does your family have cancer history?

- a. Yes
- b. No
- c. Not Sure

57. Do you have Pap smear test in the past three years (During a Pap smear test, a small sample of cells from the surface of the cervix is collected by your doctor)?

- a. Yes
- b. No
- c. Not Sure

Thanks for your participation! You may enter your email address below. We will randomly draw 10 participants to win a ¥ 50 gift card for themselves and \$25 Amazon gift card for their inviters!

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