The Effects of Information and Predisposition on

Individual Responses to Hypothetical Survey Questions

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Abstract

This study investigates the effects of information and predisposition on individual responses to hypothetical questions. By employing the empirical implications of theoretical models (EITM) framework, I confirm that information and predisposition have positive effects on individual substantive responses to the hypothetical questions about the independence-unification issue in Taiwan. Respondents with higher levels of information and predisposition are more likely to provide substantive responses. More importantly, information and predisposition exert a negative interaction effect on individual responses to hypothetical questions, which implies that when an individual counts more on information to respond to hypothetical questions, her predisposition plays a less important role in her responses and vice versa. Finally, this study suggests that hypothetical questions are effective to probe individual opinion on specific issues under hypothetical conditions.

Keywords: information, political sophistication, predisposition, hypothetical questions, EITM.

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Introduction

Political scientists have different opinions about whether people have "true attitudes" toward political, economic and social issues that pollsters are asking about. In his seminal study, Converse (1964) found that a great majority of people neither adhere to a full, complete set of beliefs which produces a clear ideology nor do they have a clear grasp of what ideology is. Accordingly, he concluded that most people do not have strong belief systems; that is, they do not think ideologically. Moreover, although minorities of people have fixed preferences and answer survey questions consistently, most simply give random answers. In other words, for Converse, most people have no "true attitudes" (or non-attitudes) and they just choose an answer in an almost random fashion at the moment of answering survey questions. On the contrary, Achen (1975) thought that people have "true attitudes," and moreover, these "true attitudes" are overwhelmingly stable. Instability in survey responses is mainly due to "measurement errors" produced by unreliable measurement instruments. On the other hand, Zaller (1992) argued that survey answers are "opinion statements" and they do not reveal a single true attitude, but instead reflect a sample of the types of concerns and predispositions people bring to bear when considering issues in the realm of politics. That is, most people respond to survey questions on the basis of whatever ideas are on their minds at the moment of answering.

The above theories are mainly based on the assumption that pollsters ask people questions about "true" issues in the real world and people may rely on their predispositions, information, or just flip mental coins to respond to these questions. However, when being asked hypothetical questions, how do people respond? Hypothetical questions are the mixture of assumed or established facts and circumstances, developed in the form of a coherent and specific situation, which are presented to people to elicit their opinions. Because hypothetical questions often ask people's opinions on assumed situations, people have no chance to think about such questions and therefore, are unlikely to form any opinions on them beforehand. Nonetheless, as Zaller said (1992: 6), "Every opinion is a marriage of information and predisposition: information to form a mental

picture of the given issue, and predisposition to motivate some conclusion about it." Accordingly, it can be known that information and predisposition jointly determine the contours of public opinion. In this study, information refers to the extent to which an individual understands political issues, whereas predisposition is defined as the stable, individual-level attitude that regulates an individual's political view. According to Zaller (1992), it is expected that when people are asked hypothetical questions, they are able to rely on information they have in mind and their predispositions to help them respond to such questions.

In order to confirm the above argument, this study examines the issue of the relationship between Taiwan and China in Taiwan. The relationship between Taiwan and China has been one of the most salient political issues in Taiwan, and thus various surveys have been conducted to investigate Taiwanese people's opinions on it. The following question has been used to gauge Taiwanese people's opinions on the relationship between Taiwan and China:

> *Concerning the relationship between Taiwan and mainland China, which of the following six positions do you agree with: (1) immediate unification, (2) immediate independence, (3) maintain the status quo, move toward unification in the future, (4) maintain the status quo, move toward independence in the future, (5) maintain the status quo, decide either unification or independence in the future, (6) maintain the status quo forever.*

According to the data from the Election Study Center at National Chengchi University in Taiwan, it is known that at present, most Taiwanese people (i.e., approximately 34 percent) prefer to maintain the status quo and then decide on either unification or independence in the future. [2] To examine the effects of information and predisposition on individual responses to hypothetical questions, this study first employs the empirical implications of theoretical models (hereafter EITM) framework to depict

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[2] With regard to the change in the Unification-Independence stance of Taiwanese, please refer to the website of the Election Study Center at National Chengchi University: http://esc.nccu.edu.tw/course/news.php?Sn=167.

their theoretical relationships and unify formal model and empirical analysis. Then this study would utilize the survey data from "Taiwan's Election and Democratization Study, 2002-2004 (IV): The Legislative Election, 2004 (hereafter TEDS2004L)" [3] to perform the empirical test due to the fact that in addition to the above question, TEDS2004L also asks a set of hypothetical questions about whether respondents support Taiwan independence or unification with China under assumed situations. As mentioned above, this study argues that when being asked such hypothetical questions, people are able to utilize information and their predisposition to offer substantive answers. If people lack information and predisposition, they are likely to choose "nonresponse" answers. Specifically, in this study, "nonresponse answers" include "refuse to answer," "it depends," "no opinion," and "don't know," whereas substantive answers are the response options except for "nonresponse" answers. This study expects to provide a clear link between information and predisposition on the one hand and individual response to hypothetical questions on the other hand. Furthermore, this study would offer a direct test of Zaller's argument that public opinion is a function of information and predisposition.

This study proceeds as follows. I first briefly review the literature on the relationships between information, predisposition and survey response. Then, I present the ETIM framework and propose a set of working hypotheses. Third, I describe the data used in this study and measurement of variables for empirical testing. Fourth, I report the results of empirical analysis of the effects of information and predisposition on individual response to hypothetical questions. Lastly, I conclude with summarized findings and provide some implications of this study.

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[3]   Data analyzed in this article were from Taiwan's Election and Democratization Studies, 2004: The Legislative Election (TEDS 2004L) (NSC 93-2420-H004-008-SSS). The coordinator of multi-year project TEDS is Professor Chi Huang (National Chengchi University). The principal investigator is Professor I-Chou Liu (National Chengchi University). More information can be found on the website of TEDS (http://www.tedsnet.org).

Information, Predisposition and Survey Response

Groves et al. (2009) thought that the cognitive processes in answering survey questions include four stages: comprehension of the question, retrieval of information, estimation and judgment, and reporting an answer. "Comprehension" includes such processes as attending to the question and accompanying instructions, assigning a meaning to the surface form of the question, and inferring the question's point. "Retrieval" is the process of recalling information relevant to answering the question from long-term memory. "Estimation" and "judgment" are the processes of combining or supplementing what the respondents have retrieved. Judgments may be based on the process of retrieval. "Reporting" is the process of selecting and communicating an answer. It includes mapping the answer onto the question's response options and altering the answer for consistency with prior answers, perceived acceptability, or other criteria. As a result, we can know that information plays an important role at the stage of retrieval and it also affects how respondents evaluate questions and make judgments about their answers.

Furthermore, previous studies have pointed out the significant effect of information on respondents' answers to survey questions. For instance, Price and Hsu (1992) examined the effects of misinformation and attitudes toward homosexuals on support for restrictive public policies aimed at HIV-infected persons. They found that misinformation about AIDS transmission and negative attitudes toward homosexuals are strong predictors of support for stringent restrictions on persons with AIDS. Jerit and Barabas (2006) investigated the effect of misinformation on knowledge about Social Security and they found that many citizens mistakenly believe that Social Security will run out of money because political elites occasionally use words that lead to overly pessimistic assessments of the program's financial future.

Although the above-mentioned studies demonstrate that information has a critical influence on people's answers to survey questions, my focus in this study is whether well-informed people are more likely to provide substantive answers to hypothetical questions, rather than how information induces people to choose some specific answers. Nadeau and

Niemi (1995) thought that those with high motivation and ability are more likely both to give a substantive answer and to answer correctly. That is, the type of answer (substantive-accurate, substantive-inaccurate, DK) depends on one's motivation to answer and one's ability to do so. Motivation is likely to come about because of interest in the topic and those who are interested are more likely to pay attention to relevant information. On the other hand, those with greater ability are more likely to use the information possessed by them to provide substantive answers. However, so far, the relationship between information and individual responses to hypothetical questions is unclear. Although some past studies used hypothetical questions to explore people's opinions on specific issues, none examined the relationship between information and the type of response. For instance, Simon (1965) mailed questionnaires which included three hypothetical questions to publishers, national-advertising managers, and retail-advertising managers to investigate their opinions about the effect of advertising rate on advertising linage and the effect of advertising linage on circulation. Simon and Simon (1974) employed hypothetical questions to look at the relationship between money incentives and family size and concluded that money incentives could have a significant influence on family size in the United States. Benson (1982) analyzed the American public's opinion on U.S. military intervention and found that when being asked about more specific hypothetical situations that might justify the use of the American troops, respondents oppose the use of troops in most instances.

Since almost all previous studies simply employed hypothetical questions to probe people's opinions on specific issues and none examined how people respond to hypothetical questions – either substantive response or nonresponse, this study is expected to provide a preliminary analysis of the relationship between information and individual responses to hypothetical questions. In regards to the relationship between information and individual responses to hypothetical questions, this study argues that people with more information are able to understand the content of hypothetical questions and quickly come up with substantive answers to them using their information as cues. Conversely, people without sufficient information has a more difficult comprehending hypothetical questions and thus fail to offer substantive answers. As a result, this study anticipates that

respondents with higher levels of information about political issues are more likely to provide substantive answers to hypothetical questions about the independence-unification issue in Taiwan.

On the other hand, a significant positive relationship between predisposition and individual responses to hypothetical questions is expected. Zaller (1992: 22) referred to predispositions as "stable, individual-level traits that regulate the acceptance or non-acceptance of the political communications the person receives." Of the various different types of predispositions, political values have received the most sustained attention from political scientists, because they have a stronger and more pervasive effect on mass opinions than any of the other predispositional factors. Values refer to "general and enduring standards" that hold a "more central position than attitudes" in individuals' belief systems (Kinder and Sears, 1985: 674) and that "lead us to take particular positions on social issues" (Rokeach, 1973: 13). For example, a person strongly attached to the value of economic individualism would be more likely to reject an argument for higher taxes to pay for social welfare spending than would someone less attached to this value (Zaller, 1992: 23). As a result, it can be inferred that when an individual has a set of core political values, she is able to easily express her preferences or opinions on policy issues asked by pollsters. In other words, she will provide a substantive response to the survey question. Although my definition of predisposition is slightly different from that of political values, I expect that the relationship between predisposition and individual responses to hypothetical questions will follow the same pattern as political values. Since predisposition reflects an individual's stable attitude toward a political issue, she is able to rely on her predisposition to offer substantive answers to survey questions about a specific political issue. Furthermore, when asked hypothetical questions, an individual can simply use her predisposition as a cue to offer substantive answers, even though she might not understand the questions. As a result, this study expects that predisposition exerts a positive effect on individual responses to hypothetical questions. That is, the stronger predisposition a person has, the more likely she is to offer substantive responses to hypothetical questions.

In this section, I briefly discuss the relationships between information, predisposition

and survey response. In the next section, I will explain the EITM framework for this study and expect to provide a clear link between theoretical model and empirical analysis.

The EITM Framework

The EITM framework places an emphasis on developing behavioral and applied statistical analogues and linking these analogues.[4] It contains three steps: the first step is to find an appropriate statistical concept to match with the theoretical concept; the second step is to find an analogue to link theoretical and statistical concepts with empirical tests; and the third step is to unify the mutually reinforcing properties of the formal and empirical analogues (see Granato et al. 2010). Therefore, I follow these three steps to propose the EITM framework for this study.

Step 1: Unify theoretical concepts and applied statistical concepts

This study argues that individual response to hypothetical questions is a function of information and predisposition. In other words, information and predisposition affect how an individual decides to answer hypothetical questions, that is, either substantive response or nonresponse. Therefore, for this study, the theoretical concept is decision making. Besides, this study focuses on individual response to hypothetical questions that is a dichotomous action (i.e., substantive response or nonresponse). Hence, for this study, the applied statistical concept is discrete choice. To sum up, decision making and discrete choice serve as the EITM relation. Furthermore, the following utility function can be derived:

$$U(R) = I + P \qquad\qquad (1)$$

where *U(R)* refers to the utility of response, *I* stands for individual level of

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[4] With regard to the definition of analogue, Granato et al. (2010: 786) argue that "An analogue is a device representing a concept via a continuous and measurable variable or set of variables."

information probability and *P* stands for individual level of predisposition to a specific issue. Moreover, let *I* and $P \geq 0$. As a result, if *U(R)* > 0, an individual will choose to provide a substantive response; if *U(R)* = 0, an individual will opt for nonresponse.

Step 2: Develop behavioral (formal) and applied statistical analogues

The behavioral analogue I use is decision theory (e.g., utility maximization), and therefore, it is known that when the utility of response is positive (i.e., *U(R) = I + P* > 0), an individual will choose to offer a substantive response. In contrast, when the utility of response is equal to zero (i.e., *U(R) = I + P* = 0), she will opt for nonresponse. Since information and predisposition are assumed to be equal to or greater than 0 (i.e., *I* and $P \geq 0$), it is known that an individual *i* will provide a substantive answer to a hypothetical question if:

1. $I_i > 0$ and $P_i > 0$.
2. $I_i > 0$ but $P_i = 0$.
3. $I_i = 0$ but $P_i > 0$.

In other words, an individual *i* will not provide a substantive answer only when $I_i = 0$ and $P_i = 0$. Furthermore, because the probability of providing a substantive response is conditioned on information and predisposition, I assume that the true values of an individual's information and predisposition are conditioned on her observed values, $\widehat{I_i}$ and $\widehat{P_i}$ via survey and set $y_i = 1$ if an individual chooses to provide a substantive response and 0 otherwise. As a result, the probability that an individual provides a substantive response can be shown as: [5]

$$Pr(y_i = 1 \mid \widehat{I_i}, \widehat{P_i}) = Pr(I_i = 1 \mid \widehat{I_i}) + Pr(P_i = 1 \mid \widehat{P_i}) \qquad (2)$$

I assume that the probability that an individual has information is independent of the probability that she has a predisposition. Therefore, equation (2) can be further written as:

$$Pr(y_i = 1 \mid \widehat{I_i}, \widehat{P_i}) = 1 - Pr(I_i = 0 \mid \widehat{I_i}) Pr(P_i = 0 \mid \widehat{P_i}) \qquad (3)$$

This equation simply presents that the probability of providing a substantive

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[5] The idea here comes from Blais and Achen (2011) and what I do is extend their idea.

response is one minus the chance that an individual's levels of information and predisposition are equal to zero (i.e., $I_i = 0$ and $P_i = 0$). Then, I take two probabilities in the above equation to be probit specifications with linear arguments. That is, I use the notation, Φ, that is, the standard normal cumulative distribution function to denote the probabilities and suppose that the probability of having information is $\Pr(I) = \Phi(\alpha_I + \beta_I \hat{I})$, and the chance of having a predisposition is $\Pr(P) = \Phi(\alpha_P + \beta_P \hat{P})$. [6] Accordingly, by using the familiar property of the standard normal cumulative distribution function that $1 - \Phi(z) = \Phi(-z)$ (Blais and Achen, 2011; Zelen and Severo, 1964), equation (3) can be rewritten as:

$$\Pr(y_i = 1 \mid \hat{I_i}, \hat{P_i}) = 1 - [1 - \Phi(\alpha_I + \beta_I \hat{I})][1 - \Phi(\alpha_P + \beta_P \hat{P})]$$

$$= 1 - \Phi(-\alpha_I - \beta_I \hat{I}) \, \Phi(-\alpha_P - \beta_P \hat{P})$$

$$= 1 - \Phi(\alpha_I \alpha_P + \alpha_P \beta_I \hat{I} + \alpha_I \beta_P \hat{P} + \beta_I \beta_P \hat{I}\hat{P})$$

$$= \Phi[\gamma_0 + \gamma_1 \hat{I} + \gamma_2 \hat{P} + \gamma_3 (\hat{I} \times \hat{P})] \qquad (4)$$

where $\gamma_0 = -\alpha_I \alpha_P$, $\gamma_1 = -\alpha_P \beta_I$, $\gamma_2 = -\alpha_I \beta_P$, and $\gamma_3 = -\beta_I \beta_P$. This equation (4) is just a conventional probit setup with one interaction term. Consequently, I would estimate a statistical model with information, predisposition as well as their interaction term. Simply speaking, the applied statistical analogue I use is discrete choice modeling, and in this study, it means a binary probit model that contains an interaction term between information and predisposition.

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[6]   I assume that information and predisposition are normally distributed, so I take the standard normal cumulative distribution. Furthermore, $\Pr(I) = \Phi(\alpha\_I + \beta\_I \; \hat{I})$, and $\Pr(P) = \Phi(\alpha\_P + \beta\_P \; \hat{P})$ are the standard representation of the cumulative density function for the normal distribution. Of course, logit analysis would work as well. The main difference between probit and logit models lies in the assumption about the distribution of the errors. Given the similarities between the two types of models, either model will produce identical substantive conclusions in most applications. In fact, if one multiplies a probit estimate by a factor of 1.814, one gets an approximate value of the corresponding logit estimate (Liao 1994: 24-25).

Step 3: Unify and evaluate the analogues

The empirical test follows directly from the theoretical model (i.e., equation 4), and methodological unification occurs when an empirical analogue for discrete choice is used. Specifically, the binary probit model is based on equation (4) and can be expressed as follows:

Probit(Substantive response) = δ_0 + δ_1(Information) + δ_2(Predisposition) + δ_3(Information × Predisposition) (5)

where δ_1 and δ_2 are expected to be positive and δ_3 is expected to be negative. From equation (4) (i.e., $\Pr(y_i = 1 \mid \widehat{I_i}, \widehat{P_i}) = 1 - \Phi(-\alpha_I - \beta_I \hat{I}) \Phi(-\alpha_P - \beta_P \hat{P})$), it is known that as an individual's level of information increases, $\Phi(-\alpha_I - \beta_I \hat{I}) \rightarrow \Phi(-\infty) = 0$. [7] Then she will approach 100 percent probability of providing a substantive response and the effect of predisposition will be negligible. By contrast, if an individual has low level of information (i.e., $\Phi((-\alpha_I - \beta_I \hat{I}) \rightarrow 1)$, then equation (4) will reduce to:

$$\Pr(y_i = 1 \mid \widehat{I_i}, \widehat{P_i}) = 1 - \Phi(-\alpha_P - \beta_P \hat{P}) \qquad (6)$$

Equation (6) reflects that when an individual does not have any information, her responses to hypothetical questions will be mainly driven by her predisposition. As a result, it can be inferred that with the increase of information, the influence of predisposition on individual responses to hypothetical questions will diminish; by contrast, lack of information will strengthen the impact of predisposition on individual responses to hypothetical questions. The interaction between information and predisposition is the key to showing the relationship that the effect of information on individual responses to hypothetical questions weakens as predisposition becomes important in affecting individual responses, and vice versa. As a result, the interaction term in equation (5) should display a negative sign. In short, this study tests the following hypotheses:

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[7] It is assumed that an individual's observed level of information is positively associated with her true level of information (i.e., β_I>0).

H₁: Information is positively associated with individual substantive response to a hypothetical question (i.e., $\delta_1 > 0$).

H₂: Predisposition is positively associated with individual substantive response to a hypothetical question (i.e., $\delta_2 > 0$).

H₃: The interaction term between information and predisposition is negatively associated with individual substantive response to a hypothetical question (i.e., $\delta_3 < 0$).

Empirical Test: Data and Measurement

This study focuses on the issue of the relationship between Taiwan and China and utilizes TEDS 2004L data. Following the standard-format question about Taiwanese people's opinion on the independence-unification issue (i.e., the wording of the standard-format question can be found in the Appendix), TEDS 2004L asked four questions about whether respondents support Taiwan's independence or unification with China under different hypothetical conditions. That is, whether respondents support Taiwan's independence if the declaration of independence would cause China to attack Taiwan; whether respondents support Taiwan's independence if the declaration of independence would not cause China to attack Taiwan; whether respondents support unification with China if the gaps in the economic, social, and political conditions between Taiwan and China were quite large; and whether respondents support unification with China if the economic, social, and political conditions between Taiwan and China were about same. Because these four questions are based upon hypothetical conditions, this study assumes that when respondents answer these questions, they would rely on their levels of information and predisposition to the independence-unification issue to help them answer such questions. The respondent's answers to the hypothetical questions about the independence-unification issue are coded as 1 for substantive response that includes all meaningful options provided by the question and 0 for nonresponse that includes answers such as "refuse to answer," "it depends," "no opinion," and "don't know."

To gauge individual levels of information, I use political sophistication as a proxy for information. Previous studies have indicated that politically sophisticated people tend to know much more about politics (McGraw and Pinney, 1990; Gallego, 2014; Sidanius, 1988). In other words, people with higher levels of political sophistication have higher levels of political information. According to Luskin (1987), political sophistication refers to the quantity and organization of a person's political cognitions and it is a fundamental concept for the understanding of individual political decision-making processes.[8] With regard to the measurement of political sophistication, political scientists have different perspectives. For instance, Luskin (1987) argued that a person is politically sophisticated to the extent to which his or her political belief system is large, wide-ranging, and highly constrained. Moreover, an individual political belief system varies in three dimensions: size (the number of cognitions), range (the coverage of the political universe), and organization (constraint), and political sophistication is the conjunction of these dimensions; Delli Carpini and Keeter (1993) concluded that factual knowledge is the best single indicator of sophistication; Bartel (1996) used interviewer's subjective assessment as a summary of respondents' political information; moreover, previous studies showed that the distribution of political sophistication is correlated with political interest (Althaus 1998; Gilens 2001; Luskin 1990); in addition, some scholars found that there is a strong bivariate correlation between educational attainment and political sophistication (Bennett 1989; Neuman 1986; Nie, Junn, and Stehlik-Barry 1996), though Luskin (1990) and Highton (2009) indicated that education has no effect on political sophistication. Due to data limitations and the fact that factual knowledge, political interest, and education are key components of political

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[8] Sometimes it is difficult to tell the difference among political sophistication, political knowledge, political awareness, and political expertise conceptually. Delli Carpini and Keeter (1996: 10) define political knowledge as "the range of factual information about politics that is stored in long-term memory." Zaller (1992: 21) refer to political awareness as "the extent to which an individual pays attention to politics and understands what he or she has encountered." Besides, according to Krosnick (1990: 4), political experts are those who "find themselves thinking often and deeply about politics and knowing a lot about political history and current affairs." In practice, the concepts of political sophistication, knowledge, and expertise are so closely related that they can be treated as identical (Delli Carpini & Keeter 1993).

sophistication, I combine a series of factual knowledge and individual levels of political interest and education to measure the respondent's level of political sophistication. As can be seen in Table 1, there are moderate correlations among factual knowledge, political interest, and educational level, and all correlation coefficients are statistically significant at the 0.001 level. Furthermore, the result of factor analysis shows that only one factor is retained (see Table 2). As a result, I am confident about combining factual knowledge, political interest, and education to create an aggregate variable for political sophistication.[9] The specific wording of all items can be found in the Appendix.

Table 1

Correlations among Political Knowledge, Political Interest and Educational Level

	Factual knowledge	Political interest	Educational level
Factual knowledge	1.00		
Political interest	0.40***	1.00	
Educational level	0.46***	0.33***	1.00

Data source: TEDS2004L.

Note: *** is significant at $p < 0.001$

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[9] First of all, in TEDS2004L, five questions are used to measure the respondent's factual knowledge. I code the respondent's answers as 1 for being correct and 0 otherwise and then sum the respondent's answers to constitute an index of political knowledge which is coded to range from 0 to 5. Therefore, the higher value means that respondents have higher level of information. Second, a continuous variable is used to measure the respondent's political interest that is coded to range from 0 to 3 and the higher values means that respondents have higher level of political interest. Finally, the respondent's educational level is treated as a continuous variable that is coded to range from 0 to 4, 0 being elementary school and 4 being college and above. The scores for these three variables are summed together to produce the variable of political sophistication.

Table 2

Factor Loadings and Unique Variances

	Factor 1	Uniqueness
Factual knowledge	0.64	0.59
Political interest	0.53	0.72
Educational level	0.59	0.66

Data source: TEDS2004L.

Second, predisposition is seen as an individual's stable attitude toward a political issue. Since this study examines individual responses to hypothetical questions about the relationship between Taiwan and China, predisposition is operationalized as an individual's attitude toward the independence-unification issue. TEDS2004L provides the eleven-point scale to gauge the respondent's attitude toward the independence-unification issue, and I recode it to range from 0 to 6, 0 being that the respondent has no opinion on this issue and 6 being that the respondent has a strong preference for either Taiwan independence or unification with China. The specific wording of this item can be found in the Appendix.

Although my theoretical model simply suggests that individual responses to hypothetical questions are a function of information and predisposition, it is suspected that some variables can also affect individual responses to the hypothetical questions about the independence-unification issue in Taiwan. Therefore, I would also estimate binary probit models with some control variables in the subsequent empirical test so that I can examine whether the empirical results based on my theoretical model are robust. Due to the close relationship between party identification and the independence-unification issue in Taiwan (i.e., the conventional wisdom holds that Democratic Progressive Party (DPP) supports Taiwan independence and Kuomintang (KMT) supports eventual unification with China), it is expected that those who have stronger party identification are more likely to provide substantive answers to the hypothetical questions about the independence-unification

issue. In addition, because this study is only concerned about whether respondents provide a substantive response or nonresponse, which party the respondent identifies with does not matter for this study. Accordingly, a continuous variable is used to measure the respondent's strength of party identification that is coded to range from 0 to 3, and the higher value means that the respondent has stronger party identification. In Taiwan, men are found to be more interested in and concerned about politics than women (Hawang & Chou, 1996; Chen & Lo, 2006), so it is likely that men are more likely than women to provide substantive responses to the hypothetical questions about the independence-unification issues. Hence, one dummy variable, "*Male,*" is coded as 1 if the respondent is male and 0 otherwise. Besides, it is also found that with the increase of age, people become more and more interested in politics (Chen & Lo, 2006). Therefore, age should be associated with individual substantive responses to hypothetical questions and it is measured by the number of years since birth. The descriptive statistics for all variables are shown in Table 3.

Table 3

Descriptive Statistics of Variables

Variable	Mean	S.D.	Min.	Max.
Opinion on independence-unification issue (hypothetical question 1)	0.88	0.32	0	1
Opinion on independence-unification issue (hypothetical question 2)	0.87	0.33	0	1
Opinion on independence-unification issue (hypothetical question 3)	0.87	0.34	0	1
Opinion on independence-unification issue (hypothetical question 4)	0.86	0.35	0	1
Political sophistication	5.76	2.59	0	12
Predisposition	2.28	1.95	0	6
Strength of party identification	1.23	1.00	0	3
Male	0.51	0.50	0	1
Age	42.00	15.51	20	90

Data source: TEDS2004L.
Note: The number of observations is 1169.

Empirical Test: Results

Before examining the effects of information and predisposition on individual responses to the hypothetical questions about the independence-unification issue, I first investigate whether there are significant differences in proportions of substantive response between respondents' answers to the standard-format and hypothetical questions about the independence-unification issue. The respondent's answer to the standard-format question is treated as a benchmark to compare with their answers to four hypothetical questions. Likewise, the respondent's answer to the standard-format question about the independence-unification issue is coded as 1 for substantive response that includes all meaningful options provided by the question and 0 for nonresponse that includes answers such as "refuse to answer," "it depends," "no opinion," and "don't know."

As shown in Table 4, the proportions of respondents' substantive response to four hypothetical questions are lower than the standard-format question and the differences in proportion of substantive response between them are statistically significant. More specifically, 90.3 percent of respondents provide substantive answers to the standard-format question, but only 85.3 percent of respondents provide substantive answers to the first hypothetical question, that is, whether respondents support Taiwan independence if the declaration of independence would cause China to attack Taiwan. Moreover, 84.1 percent of respondents provide substantive answers to the second hypothetical question, that is, whether respondents support Taiwan independence if the declaration of independence would not cause China to attack Taiwan. Additionally, 83.5 percent of respondents provide substantive answers to the third hypothetical question, that is, whether respondents support unification with China if the gaps in economic, social, and political conditions between Taiwan and China were quite large, and 82.3 percent of respondents provide substantive answers to the fourth hypothetical question, that is, whether respondents support unification with China if the economic, social, and political conditions were about the same in both Taiwan and China. In summary, it can be concluded that when being asked hypothetical questions, respondents become less and less likely to

provide substantive answers due to the fact that the hypothetical questions bring more uncertainty to respondents and thus increase the probability that respondents choose a non-substantive answer.

Table 4

Test for Difference between Proportions

Variable	Substantive response (%)	Nonresponse (%)	Test for difference between proportions[a]
Opinion on independence-unification issue (standard format)	90.3	9.7	
Opinion on independence-unification issue (hypothetical question 1)	85.3	14.7	t-statistic= 5.57 $p < 0.001$
Opinion on independence-unification issue (hypothetical question 2)	84.1	15.9	t-statistic= 6.43 $p < 0.001$
Opinion on independence-unification issue (hypothetical question 3)	83.5	16.5	t-statistic= 7.54 $p < 0.001$
Opinion on independence-unification issue (hypothetical question 4)	82.3	17.7	t-statistic= 8.05 $p < 0.001$

Data source: TEDS2004L.
Note: a: T-test is used to examine the difference in proportion of effective response between response to the standard-format question and response to four hypothetical questions.

Then the next step of my analysis is to examine whether the respondent's levels of information and predisposition affect their probability to provide substantive answers to hypothetical questions. Table 5 reports the results of binary probit analysis based on my theoretical model. As expected, political sophistication and predisposition are found to be positively associated with individual responses to the hypothetical questions about the independence-unification issue. That is, as the respondent's levels of political sophistication and predisposition increase, they are more likely to provide substantive responses to the hypothetical questions about the independence-unification issue. In addition, the interaction term between political sophistication and predisposition exerts a significant

negative effect on individual responses to the hypothetical questions about the independence-unification issue as expected, though it is not statistically significant in the third hypothetical question (i.e., whether respondents support unification with China if the gaps in economic, social, and political conditions between Taiwan and China were quite large). [10] This significant interaction effect indicates that the impacts of information and predisposition on individual responses to hypothetical questions depend on each other. Therefore, it is necessary to add the product term of political sophistication and predisposition to the equation. If the interaction term is not included in the model, we would produce biased estimates of the effects of political sophistication and predisposition on individual responses to hypothetical questions. As Ganzach (1997) said, "if the appropriate product terms are added to the equation, then the estimated model may indicate concave (convex) relationships between the independent variables and the dependent variable, whereas the true relationship is, in fact, convex (concave)."

Because the marginal effect of a change in both interacted variables is not equal to the marginal effect of changing just the interaction term and the sign may be different for different observations (Norton et al., 2004), I compute the correct marginal effect of a change in two interacted variables for each binary probit model. [11] As can be seen in Figures 1, 2, and 3, the mean interaction effects are negative but vary widely. [12] Moreover, for few observations, the interaction effect is positive, and for the others, it is negative.

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[10]   Some may suspect that there are high correlations among information, predisposition and their interaction, and thus multicollinearity might be a problem. To examine multicollinearity, I perform a diagnostic test for multicollinearity. The result shows that the values of variance inflation factor (VIF) for these three variables in all four models are smaller than 6, and the mean VIF is less than 5, which indicates no violation of multicollinearity. Therefore, multicollinearity does not pose a major threat to my analysis.

[11]   Norton et al. (2004) showed that for the probit model, $F(\cdot)$ is the familiar normal, cumulative distribution function: $F(u) = \Phi(\beta_1 x_1 + \beta_2 x_2 + \beta_{12} x_1 x_2 + X\beta)$. When the interacted variables are both continuous, the interaction effect is the double derivative with respect to x1 and x2: $\frac{\partial^2 F(u)}{\partial x_1 \partial x_2} = \{\beta_{12} - (\beta_1 + \beta_{12} x_2)(\beta_2 + \beta_{12} x_1)u\}\phi(u)$.

[12] The mean interaction effects for Figures 1, 2, and 3 are -0.009, -0.010, and -0.009, respectively. Besides, since the interaction effect in the model of the third hypothetical question is not statistically significant, I do not compute the marginal effect for it.

Overall, for people whose predicted probability of having a substantive response is around 0.3 (toward the left end of the figure) and 1.0, the interaction effect between political sophistication and predisposition is positive and negative for the predicted probability between 0.3 and 1.0.

Table 5

Binary Probit Analysis without Control Variables

	Hypothetical question 1		Hypothetical question 2		Hypothetical question 3		Hypothetical question 4	
	Coef.		Coef.		Coef.		Coef.	
	(S.D.)		(S.D.)		(S.D)		(S.D.)	
Political sophistication	0.276	***	0.252	***	0.271	***	0.289	***
	(0.030)		(0.029)		(0.031)		(0.030)	
Predisposition	0.308	***	0.376	***	0.272	***	0.334	***
	(0.060)		(0.066)		(0.059)		(0.056)	
Political sophistication×Predisposition	-0.035	**	-0.036	**	-0.018		-0.035	**
	(0.012)		(0.012)		(0.013)		(0.011)	
Constant	-0.411	**	-0.463	**	-0.572	***	-0.675	***
	(0.145)		(0.144)		(0.145)		(0.144)	
N	1169		1169		1169		1169	
Likelihood ratio test	172.72	***	182.83	***	217.28	***	213.45	***
Pseudo R^2	0.21		0.21		0.24		0.22	
-2×Log-Likelihood	668.56		703.79		704.46		753.09	

Data: TEDS2004L.

Note: 1. Coef. = Regression Coefficient; S.E. = Standard Error.

2. *** is significant at $p < 0.001$; ** is significant at $p < 0.010$.

Figure 1

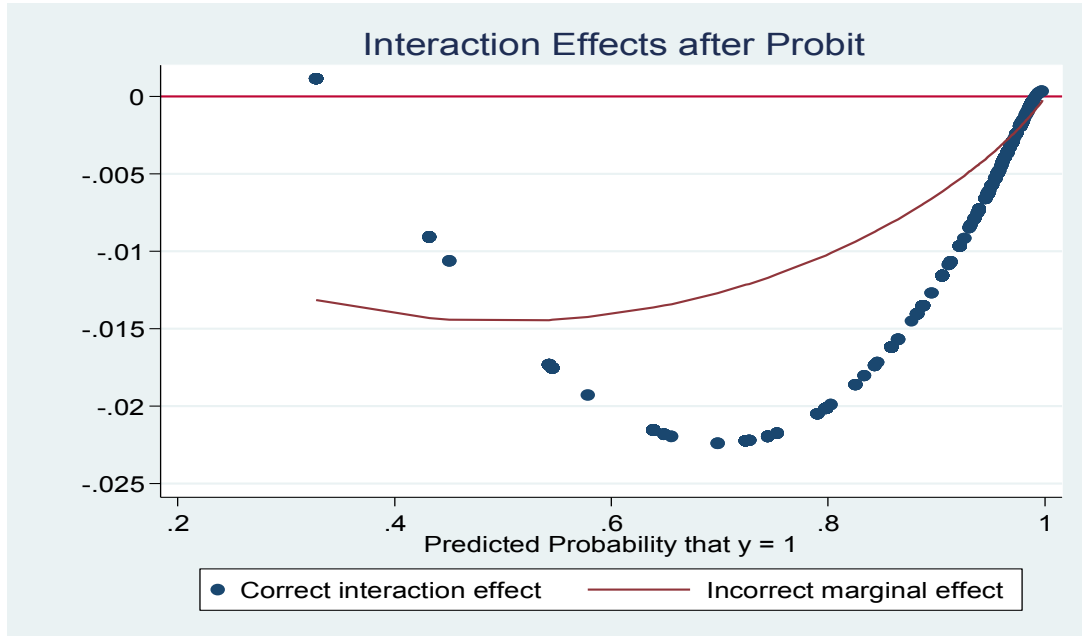*Interaction Effect for Hypothetical Question 1*

Figure 2

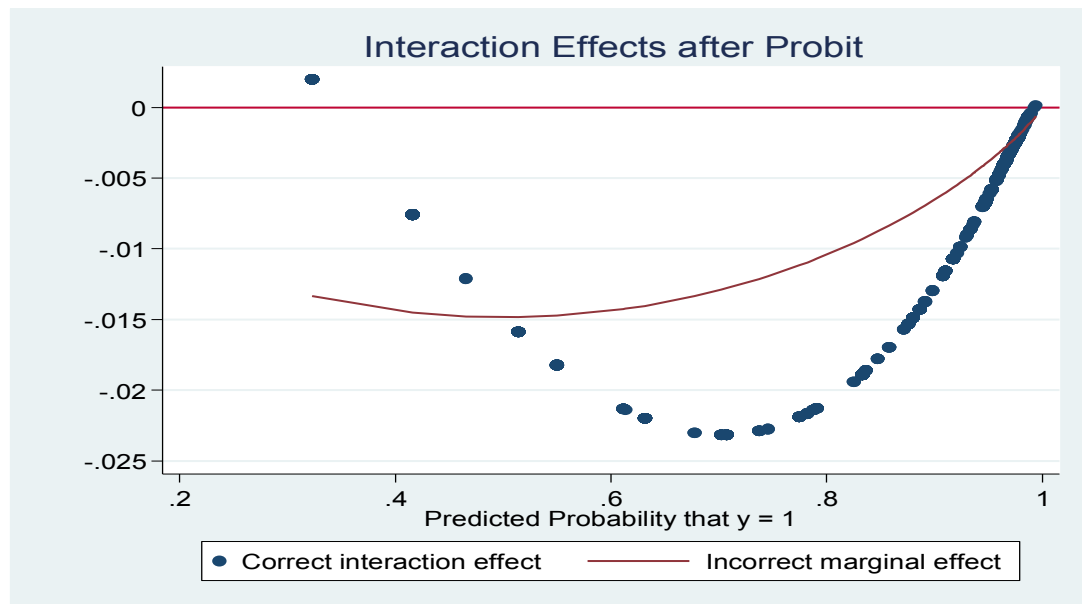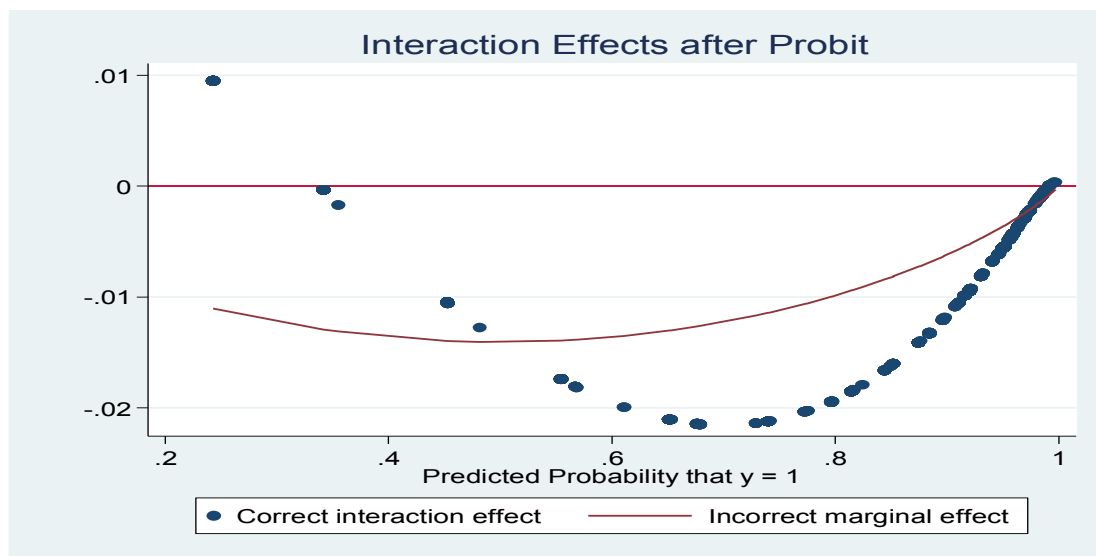*Interaction Effect for Hypothetical Question 2*

Figure 3

Interaction Effect for Hypothetical Question 4

In order to examine the robustness of the above results, I estimate binary probit models with some variables that might be related to individual responses to the hypothetical questions about the independence-unification issue. As can be seen in Table 6, although the effects of political sophistication, predisposition, and their interaction term on individual responses to the hypothetical questions about the independence-unification issue are slightly reduced because of strength of party identification and age, in general, I get consistent results that indicate political sophistication and predisposition are positively associated with individual responses to the hypothetical questions about the independence-unification issue, whereas the interaction term between political sophistication and predisposition is negatively associated with individual responses to the hypothetical questions about the independence-unification issue except for the third hypothetical question. [13] Besides, it is not surprising to find that respondents who have stronger party identification are more likely to provide substantive response to the hypothetical questions about the independence-unification issue. As

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[13] Likewise, I do the multicollinearity diagnostic and the results show that multicollinearity is not an issue in my analyses

mentioned previously, DPP and KMT have clear positions on the independence-unification issue and thus it is possible for their supporters to follow the party line to answer survey questions about the independence-unification issue, even though the questions are hypothetical. Accordingly, strong partisans will be less likely to opt for nonresponse. Besides, age has a significant negative effect on individual responses to the hypothetical questions about the independence-unification issue. A possible explanation for this result might be that older people tend to regard these hypothetical conditions as unlikely to take place so that they are reluctant to express any opinion. In summary, the empirical analysis lends strong support to my theoretical argument that people rely on their information and predisposition to answer hypothetical survey questions. That is, those who have high levels of information and predisposition are more likely to offer substantive responses to hypothetical survey questions, but more importantly, information and predisposition will alleviate, rather than aggravate, each other's effect.

Although it is found that information, predisposition and their interaction can exert significant effects on respondents' substantive responses to hypothetical questions, the more important problem that we need to be concerned about is whether it is meaningful to use hypothetical questions to investigate people's opinions on specific political, social, or economic issues.   Table 7 shows that many respondents who provide substantive answers to the standard-format question change their answers into nonresponse when answering the hypothetical questions about the independence-unification issue. The percentage of such respondents ranges between 7.7 percent and 10.4 percent of all respondents. However, the percentage of respondents who change their answers from nonresponse to substantive response only ranges between 2.0 percent and 2.9 percent of all respondents. Therefore, it seems that hypothetical questions more easily induce respondents to choose nonresponse. This may be because respondents have doubts about the rationale for hypothetical questions and thus, they are not willing to answer such questions. Besides, most respondents do not change their responses either way (i.e., from substantive response to nonresponse or from nonresponse to substantive response). The percentage of such respondents ranges between 87.1 percent and 89.6 percent of all respondents.

Table 6

Binary Probit Analysis with Control Variables

	Hypothetical question 1		Hypothetical question 2		Hypothetical question 3		Hypothetical question 4	
	Coef. (S.D.)		Coef. (S.D.)		Coef. (S.D.)		Coef. (S.D.)	
Political sophistication	0.205	***	0.190	***	0.205	***	0.207	***
	(0.034)		(0.032)		(0.034)		(0.032)	
Predisposition	0.252	***	0.334	***	0.223	***	0.288	***
	(0.060)		(0.066)		(0.060)		(0.057)	
Political sophistication×Predisposition	-0.031	**	-0.032	*	-0.014		-0.032	**
	(0.012)		(0.012)		(0.013)		(0.011)	
Strength of party identification	0.371	***	0.216	***	0.286	***	0.312	***
	(0.063)		(0.058)		(0.059)		(0.058)	
Male	-0.032		0.023		0.155		-0.061	
	(0.114)		(0.109)		(0.111)		(0.109)	
Age	-0.015	***	-0.013	**	-0.013	**	-0.021	***
	(0.004)		(0.004)		(0.004)		(0.004)	
Constant	0.347		0.227		0.034		0.433	
	(0.284)		(0.271)		(0.275)		(0.265)	
N	1169		1169		1169		1169	
Likelihood ratio test	220.16	***	206.26	***	249.68	***	269.14	***
Pseudo R^2	0.26		0.23		0.27		0.28	
-2×Log-Likelihood	621.12		680.36		672.07		697.40	

Data: TEDS2004L.

Note: 1. Coef. = Regression Coefficient; S.E. = Standard Error.

   2. *** is significant at $p < 0.001$; ** is significant at $p < 0.010$; * is significant at $p < 0.050$.

Table 7

Cross Tabulation Analysis for Standard-Format and Hypothetical Questions –Substantive Response and Nonresponse

		Standard format			
		Effective response (%)	Nonresponse (%)	N	Test for independence
Hypothetical question 1	Effective response (%)	82.6	2.7	1258	Pearson's X^2 = 355.19
	Nonresponse (%)	7.7	7.0		$p < 0.001$
Hypothetical question 2	Effective response (%)	81.2	2.9	1258	Pearson's X^2 = 292.18
	Nonresponse (%)	9.1	6.8		$p < 0.001$
Hypothetical question 3	Effective response (%)	81.5	2.0	1258	Pearson's X^2 = 388.23
	Nonresponse (%)	8.8	7.7		$p < 0.001$
Hypothetical question 4	Effective response (%)	79.9	2.5	1258	Pearson's X^2 = 301.43
	Nonresponse (%)	10.4	7.2		$p < 0.001$

Data: TEDS2004L.

Next, I further investigate whether respondents would change their opinions on the independence-unification issue when they are asked the hypothetical questions. Respondents' substantive responses are classified into three categories: "support unification", "support independence", and "maintain the status quo." Table 8 presents the result of cross tabulation analysis. When respondents are asked whether they would support independence if the declaration of independence would cause China to attack Taiwan, 52.3 percent of respondents who originally support independence change their opinion to disagree with Taiwan's independence. Moreover, being asked whether they would support independence if the declaration of independence would not cause China to attack Taiwan, 44.9 percent of respondents who originally support unification with China change their opinion to agree with Taiwan's independence. On the other hand, when asked whether they would support unification with China if the gaps in economic, social, and political conditions between Taiwan and China were quite large, 59.4 percent of respondents who originally support unification with China change their opinion to disagree with unification with China.

Furthermore, when it comes to whether to support unification with China if the economic, social, and political conditions were about the same in both Taiwan and China, 34.2 percent of respondents who originally support independence change their opinion to agree with unification with China.

Table 8

Cross Tabulation Analysis for Standard-Format and Hypothetical Questions – Substantive Response

		Standard-format question			
		Support unification (%)	Support independence (%)	Maintain the status quo, decide in the future (%)	Test for independence
Hypothetical question 1	Disagree (%)	87.3	52.3	79.3	Pearson's X^2 = 107.89
	Agree (%)	12.7	47.7	20.7	$p < 0.001$
	Total (%)	100.0	100.0	100.0	
Hypothetical question 2	Disagree (%)	55.1	16.0	24.0	Pearson's X^2 = 103.54
	Agree (%)	44.9	84.0	76.0	$p < 0.001$
	Total (%)	100.0	100.0	100.0	
Hypothetical question 3	Disagree (%)	59.4	90.8	86.0	Pearson's X^2 = 95.94
	Agree (%)	40.6	9.2	14.0	$p < 0.001$
	Total (%)	100.0	100.0	100.0	
Hypothetical condition 4	Disagree (%)	14.3	65.8	35.7	Pearson's X^2 = 157.24
	Agree (%)	85.7	34.2	64.3	$p < 0.001$
	Total (%)	100.0	100.0	100.0	

Data: TEDS2004L.

In light of the above findings, it is suggested that although hypothetical questions may increase the percentage of nonresponse, they are still useful to investigate individual

opinion on a specific issue under hypothetical conditions, because it seems that respondents would take the hypothetical conditions into consideration and then express their opinions on those hypothetical questions. Moreover, it is known that information and predisposition play an important role in individual response to a hypothetical question. Overall, this study implies that hypothetical questions are meaningful and helpful for our understanding of people's opinions under specific conditions.

Conclusions

The independence–unification issue has been one of the most salient political issues in Taiwan, and therefore, the government and political scientists of Taiwan have paid much attention to the Taiwanese people's opinion on the relationship between Taiwan and China. In TEDS2004L, in addition to the standard-format question, four hypothetical questions about the independence-unification issue are asked to investigate whether Taiwanese people would support Taiwan independence or unification with China under some hypothetical conditions. The purpose of this study is to examine the effects of information and predisposition on individual substantive responses to these hypothetical questions. By employing the EITM framework, I provide a clear link between theoretical model and empirical analysis for this study and the results of the empirical test confirm that information and predisposition have significant positive effects on individual substantive responses to the hypothetical questions about the independence-unification issue. That is, respondents who have high levels of political sophistication and predisposition are more likely to provide substantive responses. Theoretically, people seldom have opportunities to think about these hypothetical questions, because these questions are based upon hypothetical conditions which have not taken place in the real world. Consequently, when people are asked the hypothetical questions, they need more information to help them judge the possibility that the hypothetical condition takes place and evaluate the possible outcome caused by the hypothetical condition so that they can answer such a question. Or they can simply stick to their predisposition (i.e., in this study, it means individual attitude toward the relationship between Taiwan and China) to provide substantive responses

regardless of what the hypothetical conditions are. Although the findings of this study cannot completely prove the above-mentioned cognitive process, this study provides a preliminary proof that information and predisposition matter when people answer hypothetical questions.

Furthermore, this study indicates that information and predisposition can exert a negative interaction effect on individual responses to hypothetical questions, which indicates that information and predisposition depend on each other to affect individual responses to hypothetical questions and more importantly, they reduce each other's effect. Therefore, it is necessary to add the product term of information and predisposition to the statistical model when we examine the effects of information and predisposition on public opinion. Otherwise our statistical model will produce biased estimates of their relationships. Overall, this study confirms that not only information but also predisposition is conducive to individual substantive responses to hypothetical questions. Although some may argue that the findings are not new and simply common sense, I think that common sense needs empirical evidence so that it can become scientific knowledge.

Finally, this study suggests that a hypothetical question is an effective tool to investigate people's opinions on specific issues under hypothetical conditions. It is found that people indeed give different answers to different hypothetical questions about the independence-unification issue, which implies that people take hypothetical questions seriously and answer them based on their information and predisposition.

APPENDIX

Survey Questions Employed in TEDS2004L

Variables	Question wording
Opinion on independence-unification issue (Hypothetical question 1)	If a declaration of independence by Taiwan would cause the Mainland to attack Taiwan, do you favor Taiwan independence?
Opinion on independence-unification issue (Hypothetical question 2)	If a declaration of independence by Taiwan would not cause Mainland China to attack Taiwan, do you favor Taiwan independence?
Opinion on independence-unification issue (Hypothetical question 3)	Suppose that the gaps in economic, social, and political conditions were quite large, do you favor that the two sides should still unify?
Opinion on independence-unification issue (Hypothetical question 4)	If the economic, social, and political conditions were about the same in both the mainland and Taiwan, then do you favor that the two sides should unify?
Opinion on independence-unification issue (Standard format)	Concerning the relationship between Taiwan and mainland China, which of the following six positions do you agree with: (1) immediate unification, (2) immediate independence, (3) maintain the status quo, move toward unification in the future, (4) maintain the status quo, move toward independence in the future, (5) maintain the status quo, decide either unification or independence in the future, (6) maintain the status quo forever.
Political Sophistication	*Factual knowledge:* 1. Who is the current Vice President of our country? 2. Who is the President of the PRC? 3. Who is the current President of the United States? 4. How many years is a legislator's term? 5. Which body has the power to interpret the Constitution? *Political interest:* Do you commonly talk with other people about politics or elections? *Educational level:* Respondent's educational level.

Variables	Question wording
Predisposition	In our society people often talk about the question of Taiwan independence from or unification with China. Some people say that Taiwan should declare independence right away. Other people say that Taiwan and China should unify right away. Yet other people have opinions between these two positions. On this card, the position that Taiwan should immediately declare independence is at 0 on a scale from 0 to 10, and the position that Taiwan should immediately unify with the mainland is at 10. About where on this scale does your own view lie?
Strength of party identification	Do you lean very strongly, somewhat, or just a little to this party?
Gender	Respondent's gender.
Age	Respondent's age.

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