

# **Does Interviewer Personality Matter for Survey Outcomes? Evidence from a Face-to-face Panel Study in Taiwan\***

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**ABSTRACT**

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We examine the effects of personality traits on interviewer performance in terms of the likelihood of refusal using a face-to-face panel of Taiwan. Studies on interviewer personality have been rare, and most found that interviewer personality is not associated with survey out-

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comes. Yang and Yu (2011) and Jäckle et al. (2013) are few exceptions. This study adopted the well-developed NEO-FFI to measure personality traits. In addition, respondent characteristics were controlled in the multilevel model to better clarify the influence of interviewer personality. After controlling for interviewer and respondent characteristics, extraversion was found to be negatively associated with refusal, while agreeableness exhibited the opposite effect. However, no significant association was found for conscientiousness, openness, or neuroticism. These findings are somewhat different from the study of Jäckle et al. on face-to-face interviewers in the UK, as well as the study of Yang and Yu on telephone interviewers of Taiwan. The possible underlying explanations were discussed. The implications of these findings on survey practice were also discussed.

**Keywords:** interviewer personality, interviewer performance, unit non-response, refusal, Big-Five model

## 面訪員的人格特質是否會影響訪問結果？ 臺灣面訪追蹤調查的實證研究\*

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### 摘要

本研究的主要目的，在探索面訪員的人格特質對訪問結果的影

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- \* 本文採用的 NEO-FFI 量表，已取得出版商（Psychological Assessment Resources, PAR）授權，版權為 PAR 所有。本研究承蒙國科會專題研究計畫（NSC 98-2410-H-001-056-MY2）經費補助，特此致謝。
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響。我們以受訪者拒訪的可能性衡量訪員工作表現，並以五大人格模型 (five-factor model) 測量訪員的人格特徵。在調查研究領域，以訪員人格與其工作表現為題材的研究相當稀少，而相關研究多發現訪員人格與工作表現間並無顯著關係。Yang and Yu (2011)、Jäckle et al. (2013) 是少數的例外。本文採用社會科學研究領域廣被使用的 NEO-FFI 作為人格測驗工具，分析面訪員人格特質對其拒訪機率的影響效果。文中採用多階層模型 (multilevel model)，同時考量訪員、受訪者特性的可能影響。研究結果發現，外向性 (extraversion) 對樣本拒訪機率有顯著的負向影響，親和性 (agreeableness) 呈顯著的正向影響。審慎性 (conscientiousness)、開放性 (openness) 與神經質 (neuroticism) 則無顯著的影響效果。相較以英國面訪員為分析對象的 Jäckle et al. (2013)，及以臺灣電訪員為對象的 Yang and Yu (2011)，本文的研究結果不盡相同。對此，文中嘗試尋求可能的解釋。另外，也就調查實務上的意涵做了討論。

關鍵字：訪員特質、訪員表現、單位無回應、拒訪、五大人格模型

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## I. Introduction

When implementing a face-to-face survey, interviewers play an important role in determining the survey outcomes (Groves and Couper, 1998). There have been many studies investigating the effects of interviewer characteristics on survey outcomes. The demographic characteristics investigated include the interviewer's gender (Walker, 1992; Kane and Macaulay, 1993), education (Berk and Bernstein, 1988; Van Tilburg, 1998; Yang and Yu, 2008), ethnicity (Finkel et al., 1991; Davis, 1997), and interviewing experience (Durbin and Stuart, 1951; Groves and Fultz, 1985; Groves and Couper, 1998: Chap.7; Hughes et al., 2002). However, few

studies attempt to analyze the influence of interviewer personality on the survey outcomes.<sup>1</sup>

Among all the interviewer traits, interviewer personality deserves special discussion. Some interviewer characteristics (e.g., gender, education, interviewing experience), although shown to be contributing factors for interviewer performance, cannot be used to screen interviewers in advance due to anti-discrimination legislation or practical concerns. As to interviewer personality, the scenario might be different. Once certain personality traits are identified as important factors for survey outcomes, they can be used in survey practice to recruit new interviewers or to predict job performance of existing interviewers.

As indicated above, there have been very few studies on the association between the interviewer's personality and job performance (e.g., Axelrod and Cannell, 1959; Groves and Couper, 1998; Johnson and Price, 1988; Jäckle et al., 2013). Furthermore, the personality measures used in most relevant studies were either not based on rigorous theories or rather narrow in scope.<sup>2</sup> And most of these studies found there is no association between interviewer personality and survey outcomes. Yang and Yu (2011) and Jäckle et al. (2013) are exceptions.

Both Yang and Yu (2011) and Jäckle et al. (2013) adopted the well-developed five-factor personality inventory to explore the relationship between interviewer personality and interview completion. The former focused on face-to-face interviewers in the UK, while the latter targeted telephone interviewers in Taiwan. Jäckle et al. (2013) found extraversion

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1. see, for example, the discussion of Jäckle et al. (2013).

2. Exceptions include Yang and Yu (2011) and Jäckle et al. (2013).

is positively associated with the probability of cooperation, but agreeableness and openness turned out to exhibit the opposite effect. Neither conscientiousness nor neuroticism was significant. As to Yang and Yu (2011), the only significant personality factor was extraversion. Similar to Jäckle et al. (2013), extraversion was found to be positively associated with the probability of completion in Yang and Yu (2011).

To complete an interview, a face-to-face interviewer has to react to the concerns and queries raised by the respondent, and to persuade the reluctant respondent into cooperation at the doorstep. Because the personality traits crucial for face-to-face interviewers might be different from those of telephone interviewers, and the effects of interviewer personality may be different between Taiwan and the UK, it is worthwhile to examine the role of interviewer personality in face-to-face surveys of Taiwan.

In addition to research interest, a delicate study on the effects of personality traits has potential contribution to survey practice. It has been known that interviewer training costs represent a huge portion of budgets of survey projects. According to Wojcik and Hunt (1998: 331), field interviewer training costs often account for a figure in excess of ten percent of total budgets. Screening interviewers effectively in recruiting, if possible, may reduce the training costs spent on unqualified interviewers, and improve response rates at the same time. Understanding that interviewer traits matter for survey outcomes is crucial for deciding the criteria in recruiting interviewers.

In this study, datasets related to a face-to-face panel survey conducted in Taiwan are used to explore the issue in depth. In Section 2, we briefly review the five-factor personality model, and discuss the relevant studies on interviewer personality and survey outcomes. Furthermore, the possible effects of interviewer personality on interview completion are discussed.

In Section 3, we introduce the analytical model and the contents of our panel data along with the variables. The results are presented in Section 4. The final section concludes with a short discussion.

## II. Literature Review and Hypotheses

### A. Five-factor personality model

In the past two decades, the five-factor personality model (or the “Big Five” model) has become one of the most dominant perspectives in psychology (Goldberg, 1993a; 1993b; John et al., 2008). With its clearly defined dimensions and ample empirical results in relation to job performance, the Big Five model seems an ideal choice. The five dimensions in the Big Five model are neuroticism (N), extraversion (E), openness (O), agreeableness (A), and conscientiousness (C). As mentioned in John et al. (2008: 116), the five-factor model does not represent a particular theoretical perspective, but was derived from analyses of the natural-language terms people use to describe themselves and others.<sup>3</sup> The first relevant personality questionnaire was developed by Costa and McCrae (1985), namely the NEO Personality Inventory. It was designed to measure the three dimensions, i.e., neuroticism, extraversion and openness. In later research, Costa and McCrae extended their model by adding the agreeableness and conscientiousness dimensions. They also demonstrated that their five questionnaire scales converged with lexically based measures of the Big Five (McCrae and Costa, 1985; 1987).

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3. See, for example, Norman (1963) and Goldberg (1981) for the studies on personality lexicons.

The 240-item NEO Personality Inventory Revised (NEO-PI-R) was published in the early 1990s (Costa and McCrae, 1992). In this most complete version, there are 6 facets in each dimension, and every facet of a dimension is measured with 8 questions. The facets of neuroticism are anxiety, angry hostility, depression, self-consciousness, impulsiveness and vulnerability. Facets of extraversion are warmth, gregariousness, assertiveness, activity, excitement-seeking, and positive emotions. Those of openness are fantasy, aesthetics, feelings, actions, ideas, and values. The facets of agreeableness include trust, straightforwardness, altruism, compliance, modesty, and tender-mindedness. Of conscientiousness, the facets are competence, order, dutifulness, achievement striving, self-discipline, and deliberation.

Since the NEO-PI-R was too lengthy for many research applications, Costa and McCrae (1992) also developed an abbreviated version of 60 items (NEO Five-factor Inventory, NEO-FFI). Even though other researchers have developed different questionnaires for Big-Five,<sup>4</sup> NEO-PI-R and NEO-FFI are the most commonly used measures (Scandell, 2000).

In recent years, the five-factor personality model has been widely applied in many fields (e.g., personnel psychology, personality psychology, personnel management, labor economics) to analyze the association between the employee's personality and job performance for various occupations (Barrick and Mount, 1991; 1993; Barrick et al., 1993).

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4. For the development of questionnaire-based Big Five research, see John et al. (2008) for detailed discussion.

## B. Studies on interviewer personality

In the field of survey methodology, there are very few studies adopting the five-factor personality model to analyze the relationship between the interviewer's personality and job performance. If the interest of study is further confined to face-to-face interviewers, the relevant studies are even more scarce (Jäckle et al., 2013).

To complete an interview, a face-to-face interviewer has to contact the targeted individual and persuade the reluctant respondent into cooperation. From this perspective, a salesperson is similar to a face-to-face interviewer in the task. Studies on the relationship between personality factors and sales performance have usually found that conscientiousness and/or extraversion traits are significant personality factors. Some found both significant (Barrick and Mount, 1991; Barrick et al., 2002; Hurtz and Donovan, 2000; Vinchur et al., 1998); some found only extraversion significant (Furnham and Miller, 1997; 2008); and some found only conscientiousness significant (Mount and Barrick, 1995). However, because a respondent's doorstep decision about whether to accept an interview might be very different from whether to buy a product, we cannot simply borrow the findings of salespersons to predict the key personality traits for a successful interviewer.

Concerning the possible association between a face-to-face interviewer's personality factors and the probability of cooperation, Jäckle et al. (2013: 4) proposed the following conjectures.

- Agreeableness: An agreeable interviewer is likely to be more compassionate and better at identifying the concerns of the respondent. Besides, the respondent may find it harder to refuse a request from an agreeable interviewer.

- Conscientiousness: A conscientious interviewer is likely to be more diligent and thorough.
- Extraversion: An extravert interviewer is likely to be better at creating and maintaining an interaction with the respondent.
- Neuroticism: A neurotic interviewer is likely to be less resilient to setbacks and discouragement.
- Openness: An open interviewer is likely to be more understanding of the concerns and queries raised by the respondent, which should better equip the interviewer to tailor his or her reactions to the respondent's concerns and queries.

Based on these conjectures, Jäckle et al. (2013) predicted that the probability of cooperation is positively associated with agreeableness, conscientiousness, extraversion and openness, and negatively associated with neuroticism.

The main data of Jäckle et al. (2013) were from 28 face-to-face surveys conducted by the UK National Center for Social Research (NatCen) between December 2007 and December 2008. The interviewers who worked for NatCen were asked to complete a mailed questionnaire in May 2008. In the questionnaire, a 15-item version of the big-five inventory was adopted to assess the interviewers' personality traits. The sample consisted of 842 interviewers and more than 100,000 cases. The multivariate regression results indicated that, after controlling for the survey and area characteristics, extraversion exhibited a positive effect on the probability of cooperation, while both agreeableness and openness had the opposite effects. But when interviewer experience and attitudes were further controlled, extraversion was no longer significant. Neither conscientiousness nor neuroticism was significantly associated with cooperation.

Thus, only the effect of extraversion was partially consistent with the hypothesis in Jäckle et al. (2013), while the effects of openness and agreeableness were in the opposite direction to their hypotheses. Concerning the negative association between agreeableness and cooperation, Jäckle et al. explained that an agreeable interviewer might be more respondent-oriented, and thus less likely to persuade a reluctant respondent to accept the interview. As to the finding on openness, Jäckle et al. did not provide any explanation.

Some earlier studies have used other personality measures to explore the relationship between interviewer personality and survey outcomes (e.g., Axelrod and Cannell, 1959; Groves and Couper, 1998; Johnson and Price, 1988). For example, Axelrod and Cannell (1959) examined the effects of various traits on interviewer performance and found small differences in the scores on empathy and three of the ten Guilford-Zimmerman factors (measures for personality factors) between better and poorer interviewers among the 175 interviewers in the Survey Research Center, University of Michigan. The three factors are restraint, thoughtfulness-effectiveness, and personal relations. Johnson and Price (1988) used the Jackson Personality Inventory to look at the association between personality traits and supervisor ratings of interviewers and found that the interviewers' completion rates were weakly and positively associated with their social adroitness and organization. Groves and Couper (1998: Chap. 7) investigated the association between 138 interviewers' self-monitoring ability (meaning that the interviewer can adjust his or her own behavior to adapt to the situation or to others' expectation) and their performance. Unexpectedly, they found that the interviewers' average self-monitoring score was lower than that of the student sample. Moreover, the self-monitoring ability was not significantly related to the completion rates. However, the personality measures used in

these studies are not as pervasive and widely accepted as the five-factor personality inventory. To better understand the relationship between interviewer personality and survey outcomes, the five-factor personality inventory is definitely a more suitable instrument.

To our knowledge, in Taiwan there has been only one published article on the association between interviewer personality and survey outcomes. Yang and Yu (2011) collected data from 52 telephone interviewers and analyzed their performance in three telephone surveys conducted by the Center for Survey Research, Academia Sinica. Yang and Yu found that, within the five personality factors, only extraversion was positively associated with the probability of interview completion, while agreeableness, openness, conscientiousness, and neuroticism were insignificant.

### **C. Conjectured effects of interviewer personality**

As mentioned earlier, the purpose of this study is to explore the association between interviewer personality and probability of refusal using a face-to-face panel survey of Taiwan. Face-to-face interviewers, unlike telephone interviewers, have to make personal contact to the respondents and react to the concerns and queries raised by the respondents. The personality traits required to complete an interview may be different from those of the telephone interviewers.

Because Taiwan is more collectivistic than the Western societies (Wheeler et al., 1989; Hofstede, 1984; 2001; Chiou, 2001; Wu, 2006), the interviewer personality traits which matter for survey outcome may be different from those in the Western world. As indicated in Wheeler et al. (1989: 81), people in a collectivistic society tend to stress harmonious interactions, whereas those in an individualistic society appear to focus on meeting their

personal needs.

In addition to cultural background, the design of this study is different from that of Jäckle et al. (2013) in several aspects. First, Jäckle et al. used cross-sectional surveys, while the primary data source of this study is a panel survey. By adopting panel data, it is feasible to control for respondent characteristics and to better understand the influence of interviewer traits. Second, this study uses the 60-item NEO-FFI as the measures for personality, which is more widely adopted than the 15-item inventory used by Jäckle et al. Third, NEO-FFI and other relevant information of interviewers were collected using a self-administered questionnaire during interviewer training, and nearly all the interviewers who participated in the survey completed the questionnaire. In Jäckle et al. (2013), the information on interviewers was collected by mail survey, and only about 80% of the interviewers provided a completed questionnaire.

According to Barrick and Mount (1991), among the five factors, extraversion and agreeableness are valid predictors for the occupations which involve frequent and tense interaction with others. Based on the theory of personality psychology and the empirical studies of Jäckle et al. (2013) and Yang and Yu (2011), we predict that extraversion is negatively associated with the likelihood of refusal. As indicated by Jäckle et al. (2013), an extraverted interviewer is better at creating and maintaining interaction with the respondent, and thus is more likely to have a lower refusal rate. As to agreeableness, an agreeable interviewer is likely to be more compassionate and better at identifying the concerns of the respondent (Jäckle et al., 2013: 4). Nevertheless, an agreeable interviewer is likely to avoid conflict and concede to the refusal intentions shown by the respondent. The effect of agreeableness on refusal depends on which of these

conflicting impacts dominates in the end.

### III. Method and Data

#### A. Method

A multilevel model is particularly suitable for analyzing the effects of interviewer characteristics on survey outcomes, since it takes into consideration the hierarchical nature of the framework.<sup>5</sup> As stated earlier, we have data consisting of respondents (first-level) and interviewers (second-level). For a respondent  $i$  interviewed by interviewer  $j$ , we observe a binary outcome,  $y_{ij}$ , with  $y_{ij}=1$  if the interview ends up in refusal, and  $y_{ij}=0$  if the interview is completed. Let the probability of refusal be  $p_{ij}=\Pr(y_{ij}=1)$  and let  $p_{ij}$  be modeled using a logit link function. The first-level logit model can be written as

$$\log(p_{ij}/1-p_{ij})=\beta_{0j}+\sum_{k=1}^K\beta_{kj}Z_{kij}+e_{ij}, \quad (1)$$

where  $Z_{kij}$  is the  $k$ th control variable for respondent  $i$  interviewed by interviewer  $j$ , and its corresponding coefficient is  $\beta_{kj}$ . In the analysis,  $Z_{kij}$ 's include the respondent's gender, marital status, education, residential area, and the inclination to refuse in the prior wave.<sup>6</sup> Because the interviewers were not randomly assigned to the respondents, similar to the setting of Yang and Yu (2008), the respondent's residential area is categorized into several dummies according to the strata of sampling.  $\beta_{0j}$  is the intercept for

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5. See Hox (1994), Guo and Zhao (2000), and Dailey and Claus (2001) for examples.

6. The birth year of the respondents is between 1977 and 1983. Because the age range among respondents is rather narrow, age and birth year are not added in the model as controlled variables.

interviewer  $j$ , and  $e_{ij}$  is the error term of the first-level model.

In the second-level, the intercept,  $\beta_{0j}$ , is allowed to vary after being modeled with the interviewers' characteristics:

$$\beta_{0j} = \gamma_{00} + \sum_{l=1}^L \gamma_{0l} X_{lj} + \sum_{m=1}^M \gamma_{0m} W_{mj} + \varepsilon_{0j}. \quad (2)$$

In equation (2),  $\gamma_{00}$  is the overall intercept across all interviewers.  $X_{lj}$  denotes the  $l$ th independent variable for interviewer  $j$ , with its corresponding coefficient being  $\gamma_{0l}$ . As described in Section 2,  $X_{lj}$ 's include measures of interviewer personality. The  $W_{mj}$ 's contain the control variables for interviewer  $j$ , with the corresponding coefficients being  $\gamma_{0m}$ 's. The error term  $\varepsilon_{0j}$  is assumed to follow a standard normal distribution. Similar to the setup of existing studies (Olson and Peytchev, 2007; Durrant et al., 2010; Olson and Bilgen, 2011), interviewer's gender, education and interviewing experience are controlled in our models. In addition, interviewer's marital status is controlled because family and marriage are the main themes of the Panel Study of Family Dynamics (PSFD) used in the analysis. By the inclusion of the interviewer's marital status, one can observe whether a theme-related interviewer characteristic is associated with the probability of refusal.

All the coefficients for the respondents' control variables, the  $\beta_{kj}$ 's, in equation (1) are assumed to be fixed (i.e.,  $\beta_{kj} = \gamma_{k0}$ ). Equations (1)–(2) constitute our overall model, and the model is estimated by the Laplace iteration algorithm in the statistical software, HLM. Our main interest is in the coefficients of the independent variables in the interviewer level. The coefficients  $\gamma_{0l}$ 's are used to examine our conjectures.

## B. Data

The data used in the analysis are mainly from the PSFD. The PSFD is

an island-wide face-to-face panel survey launched in 1999 under the auspices of the Academia Sinica in Taiwan.<sup>7</sup> The surveys were conducted by the Center for Survey Research (CSR). The interviewers were also recruited, trained, and supervised by the center.<sup>8</sup> The PSFD contains four cohorts of respondents: Cohort 1 was born between 1953 and 1964, cohort 2 between 1935 and 1954, cohort 3 between 1964 and 1976, and cohort 4 between 1977 and 1983. They were first introduced to the survey in the years 1999, 2000, 2003, and 2009, respectively. In the first-wave survey of each cohort, the sample was randomly drawn by a stratified three-stage sampling procedure based on the household registration records. These respondents were then followed up by face-to-face interview on an annual basis.

The CSR has a standardized procedure to implement face-to-face surveys. About two weeks before the implementation of the PSFD, an advanced letter was sent to each targeted respondent by postal mail. All the interviewers who participated in the survey had to attend a two-day training session held in the Academia Sinica. The training courses included design and contents of the questionnaire, interviewing and persuasion skills, recording and coding procedures, etc. Due to the concern of travelling costs, the interviewers were assigned to the targeted respondents according to their residential areas.

In this study, we focus on cohort 4 (born between 1977 and 1983). This cohort was first surveyed in 2009. The attrition rate between the first wave (2009) and second wave (2010) of this cohort was about 20%, and it stayed

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7. Further information on the PSFD project can be found on its website (<http://psfd.sinica.edu.tw/>).

8. Interested readers can visit the CSR website (<http://survey.sinica.edu.tw/>) for detailed information.

at about 3–5% in later waves. The respondents who completed the questionnaire in 2009 and were contacted successfully in 2010 were kept as our analytical sample. Specifically, for a respondent who completed the interview in 2009 and was contacted by the interviewer in 2010, we are interested in whether he or she rejected the interview in 2010. Whether a contacted respondent rejected the interview in the second wave is more worthy of exploring than that of later waves because there is more variation in the dependent variable among the respondents due to the higher attrition rate.<sup>9</sup>

Thus, the 2009 PSFD survey data and the interviewing records of the 2010 follow-up were used in the analysis. The dispositions of the interviewing outcomes are defined similarly to those of AAPOR (2008). Among the 2,182 respondents of cohort 4 who completed interviews in 2009, those who had the following final dispositions in the 2010 survey were excluded from our sample for analysis: (1) death prior to or during the survey, (2) in military service, (3) imprisoned or at-large criminal suspect, (4) whereabouts unknown, (5) incapable of communication, (6) unable to be contacted during the fieldwork period. After deleting these cases and dropping the cases with missing information, the number of respondents left is 1,772.

The information of interviewers came from two sources. One is the interviewer's demographic information provided by the CSR. The other is a self-administered questionnaire collected during the interviewer training of the 2010 survey. The demographic information provided by the CSR contained the interviewer's birth year, education, and the number of CSR survey projects they participated in. The self-administered questionnaire

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9. Because the analytical sample is those who completed the interview in the first-wave survey of 2009, the self-selection problem involved in the analysis is not serious.

for interviewers contained items on personality traits and other relevant questions. Each interviewer was paid \$300 NT dollars for participation. Among the 103 interviewers who were responsible for the cohort 4 respondents, 91 completed the questionnaires. Within the 91 interviewers, 34 were in charge of very few interview cases. Out of concern that these few cases might distort the analytical results, the interviewers who were assigned fewer than five cases were deleted from our sample. After the deletion, the numbers of respondents and interviewers left in the current study are 1,772 and 57, respectively.

Because the interviewers were assigned to the respondents according to their residential areas, it was impossible to entirely disentangle the effects of the interviewer's characteristics from the effects of locality. To partially remedy this problem, we create several dummy variables indicating the urbanization levels of the residential areas and use them as part of the controlled variables. This shall be explained further in the following subsection.

### **C. Variables**

In Table 1, we list the names, definitions, and descriptive statistics of all the variables. Most of the definitions are self-explanatory. Therefore, only some of the measures are discussed in detail below.

#### **(A) Dependent Variable**

From the information of the interviewing records, we define the dependent variable as whether a contacted respondent refused to be interviewed in the 2010 survey. The value of this binary variable (*Refusal*) is 1 if the respondent him/her-self or his/her family member refused to take the interview, and 0 otherwise. Within the 1,772 contacted respondents, 16% turned out to be refusal cases, as indicated in Table 1.

Table 1 Variable definitions and descriptive statistics

| Variable name  | Definition  | Mean  | (Std. Dev.) |
|--|---|-------|-------------|
| <b>Dependent variable</b>                            |   |       |             |
| <i>Refusal</i>                                       | = 1 if interviewer was rejected by respondent for an interview in 2010, otherwise 0.                                      | 0.16  | (0.36)      |
| <b>Independent variables—Interviewer personality</b> |   |       |             |
| <i>Neuroticism</i>                                   | Sum of interviewer's item scores on the neuroticism dimension. (potential range is 12 to 60)                              | 27.26 | (5.48)      |
| <i>Extraversion</i>                                  | Sum of interviewer's item scores on the extraversion dimension. (potential range is 12 to 60)                             | 40.07 | (5.27)      |
| <i>Openness</i>                                      | Sum of interviewer's item scores on the openness dimension. (potential range is 12 to 60)                                 | 39.54 | (6.28)      |
| <i>Agreeableness</i>                                 | Sum of interviewer's item scores on the agreeableness dimension. (potential range is 12 to 60)                            | 46.53 | (4.44)      |
| <i>Conscientiousness</i>                             | Sum of interviewer's item scores on the conscientiousness dimension. (potential range is 12 to 60)                        | 46.86 | (4.33)      |
| <b>Control variables—Interviewer</b>                 |   |       |             |
| <i>I_woman</i>                                       | = 1 if interviewer is female, otherwise 0.  | 0.74  | (0.44)      |
| <i>I_married</i>                                     | = 1 if interviewer is married, otherwise 0.   | 0.54  | (0.50)      |
| <i>I_college</i>                                     | = 1 if interviewer's education is college or above; otherwise 0.  | 0.72  | (0.45)      |
| <i>I_exp</i>   | = Number of CSR interviews the interviewer had participated in.   | 4.86  | (4.15)      |
| <b>Control variables—Respondent</b>                  |   |       |             |
| <i>R_woman</i>                                       | = 1 if respondent is female, otherwise 0.   | 0.46  | (0.50)      |
| <i>R_married</i>                                     | = 1 if respondent is married, otherwise 0.  | 0.30  | (0.46)      |
| <i>R_jr_high</i>                                     | = 1 if respondent receives at most junior high school education, otherwise 0. (senior high school is the reference group) | 0.05  | (0.22)      |
| <i>R_college</i>                                     | = 1 if respondent receives at least junior college education, otherwise 0. (senior high school is the reference group)    | 0.67  | (0.47)      |

Table 1 Variable definitions and descriptive statistics (Continued)

| Variable name         | Definition  | Mean | (Std. Dev.) |
|-----------------------|---|------|-------------|
| <i>R_refusal</i>      | = 1 if respondent indicated an intention to refuse to be interviewed during the interview of 2009 although s/he finally completed the interview, otherwise 0. | 0.14 | (0.35)      |
| <i>R_Taipei</i>       | = 1 if respondent resides in Taipei City, otherwise 0. (the reference group is those in the countryside)  | 0.13 | (0.33)      |
| <i>R_Kaohsiung</i>    | = 1 if respondent resides in Kaohsiung City, otherwise 0. (the reference group is those in the countryside)   | 0.03 | (0.18)      |
| <i>R_city</i>         | = 1 if respondent resides in a provincial city in Taiwan, otherwise 0. (the reference group is those in the countryside)                                      | 0.17 | (0.37)      |
| <i>R_township1</i>    | = 1 if respondent resides in a very highly urbanized township (新興鄉鎮), otherwise 0. (the reference group is those in the countryside)                          | 0.17 | (0.38)      |
| <i>R_township2</i>    | = 1 if respondent resides in a highly urbanized township (工商市鎮), otherwise 0. (the reference group is those in the countryside)                               | 0.16 | (0.36)      |
| <i>R_township3</i>    | = 1 if respondent resides in a low-urbanized township (綜合性市鎮), otherwise 0. (the reference group is those in the countryside)                                 | 0.07 | (0.25)      |
| <i>R_township4</i>    | = 1 if respondent resides in a very low-urbanized township (服務性市鎮), otherwise 0. (the reference group is those in the countryside)                            | 0.13 | (0.33)      |
| <i>R_countrysides</i> | = 1 if respondent resides in the countryside, otherwise 0. (the reference group)  | 0.14 | (0.35)      |

### (B) Independent Variables

As explained in prior sections, the independent variable of interest in our study is interviewer personality. The measures are explained in detail below.

#### — Interviewer personality

The big-five personality inventory adopted in our study is the NEO-FFI developed by Costa and McCrae (1992). The NEO-FFI consists of 60 items,

12 for each of the five factors: neuroticism, extraversion, openness, agreeableness, and conscientious.<sup>10</sup> Each item is a statement with five options ranging from “strongly agree” to “strongly disagree.” The interviewer was asked to choose an option that best describes himself or herself. In computing scale scores, items were first recoded to be in the direction of the factor name. Then scores of items of the same factor were added up to form a factor score. As the lowest score of an item is 1 and the highest 5, the lowest score for a factor is 12, and the highest 60. Each interviewer has a score for each of the five dimensions.<sup>11</sup> From Table 1, interviewers on average considered themselves quite low in neuroticism and pretty agreeable and conscientious.

### (C) Control Variables

#### — Interviewer-level control variables

The control variables for interviewers include interviewing experience, gender, marital status, and education levels.

Interviewing experience, *I\_exp*, is measured by the number of CSR survey projects the interviewer participated in. In the existing studies, within-organization interviewing experience is found to be positively related to interviewer performance (Sheatsley, 1951; Hyman et al., 1954; Groves and Couper, 1998: Chap.7; Inderfurth, 1972; Lievesley,

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10. The NEO-FFI used in the study is authorized by the Psychological Assessment Resources, Inc. Due to the regulation of the authorization, we cannot reveal the content of the inventory. Interested readers may contact the Psychological Assessment Resources, Inc. for further information.

11. The NEO-FFI has been well developed and widely adopted by social scientists. Due to the limitation of length, the reliability and validity are not discussed in this study. Interested readers can find relevant discussion in, for example, Yang et al. (1999) and Caruso (2000).

1988). Therefore, we predict that a higher  $I\_exp$  is associated with a lower likelihood of refusal.

As shown in Table 1, the average number of CSR survey projects an interviewer attended was 4.86. 74% of the interviewers were women, and 54% were married. About three quarters (72%) had at least a junior college education.

— Respondent-level control variables

The control variables of the respondents include basic demographic variables, such as their gender, marital status, and education levels. Besides, it can be anticipated that some characteristics of the respondent (e.g., residential area, inclination to refuse in previous survey) might be associated with the likelihood of refusal in the 2010 survey. We include these variables as well. It can be seen from Table 1 that 5% of the respondents have at most a junior high school education, 67% at least a junior college education and thus 28% ( $=100\% - 5\% - 67\%$ ) have a senior high school education. Within the completed interviews of the 2009 survey, fourteen percent indicated an intention to refuse during the interview process. As explained earlier, eight dummy variables were created to characterize the urbanization level of the area in which the respondents resided. The other control variables are constructed using the survey data of 2009. The definitions of all the variables are given in Table 1.

## IV. Findings

In Table 2 we present a basic model with only control variables included to predict a refusal in the 2010 survey. The significant interviewer-level

Table 2 Basic Model: Control Variables on Likelihood of Refusal

| Variable                      | Coefficient | Std. Er. |
|-------------------------------|-------------|----------|
| Control Variables—Interviewer |             |          |
| <i>I_woman</i>                | 0.015       | (0.138)  |
| <i>I_married</i>              | -0.254      | (0.153)  |
| <i>I_college</i>              | 0.326*      | (0.187)  |
| <i>I_exp</i>                  | -0.055***   | (0.020)  |
| Control Variables—Respondent  |             |          |
| <i>R_woman</i>                | 0.554***    | (0.175)  |
| <i>R_married</i>              | 0.110       | (0.160)  |
| <i>R_jr_hi</i>                | 0.218       | (0.367)  |
| <i>R_coll</i>                 | 0.040       | (0.172)  |
| <i>R_refusal</i>              | 1.303***    | (0.145)  |
| <i>R_Taipei</i>               | 0.442*      | (0.244)  |
| <i>R_Kaohsiung</i>            | 1.352***    | (0.295)  |
| <i>R_city</i>                 | 0.264       | (0.240)  |
| <i>R_township1</i>            | 0.429       | (0.275)  |
| <i>R_township2</i>            | 0.268       | (0.270)  |
| <i>R_township3</i>            | 0.776***    | (0.164)  |
| <i>R_township4</i>            | -0.363      | (0.240)  |
| Intercept                     | -2.498 ***  | (0.299)  |
| First-level sample size       |             | 1,772    |
| Second-level sample size      |             | 57       |
| Var ( $\varepsilon_{0j}$ )    |             | 0.026    |

\*, \*\*, \*\*\* indicate two-tailed significance at 10%, 5%, 1% level, respectively.

variables include *I\_exp* and *I\_college*. The effect of the CSR-specific interviewing experience (*I\_exp*) is negatively significant, which is consistent with the expectation. Interviewers with higher education (*I\_college*=1) are

less likely to gain cooperation from the respondents.<sup>12</sup>

Regarding the respondent-level variables, the respondent's gender ( $R\_woman$ ), refusal tendency shown in previous wave ( $R\_refusal$ ), and several regional dummies are significant. The positive sign of  $R\_refusal$  indicates that if a respondent revealed intention to refuse in the 2009 survey, he or she was more likely to refuse in the 2010 follow-up. Female ( $R\_woman=1$ ) respondents were more likely to refuse in the 2010 interview. This indicates that female respondents might be more defendant and resistant to take interviews than the males. The findings on urbanization dummies indicate that respondents who resided in more urbanized areas such as Taipei city ( $R\_Taipei=1$ ), Kaohsiung city ( $R\_Kaohsiung=1$ ) or certain township ( $R\_township3=1$ ) were less likely to complete interviews.

In Table 3, the five personality factors of interviewer were included in addition to the variables of Table 2. Of the five dimensions, only extraversion and agreeableness are significant predictors at the two-tailed significance level of 10%. These two findings are consistent with those of Jäckle et al. (2013). An extraverted interviewer is more likely to enjoy interacting with respondents, and is more enthusiastic and action-oriented, and therefore is associated with a lower probability of refusal. An agreeable interviewer, who is regarded to be courteous, considerate and compliant toward others, might find it hard to persuade a reluctant respondent into cooperation. This may result in the positive association between agreeableness and refusal.

A conscientious interviewer is likely to be more self-disciplined and dutiful. But perhaps because these traits are less relevant to the social inter-

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12. For a review of the effects of interviewer education on survey outcomes, see Yang and Yu (2008) for example.

Table 3 Extended Model: Interviewer Personality Traits Included

| Variable                          | Coefficient | Std. Er. |
|-----------------------------------|-------------|----------|
| Independent Variables—Interviewer |             |          |
| <i>Neuroticism</i>                | -0.018      | (0.020)  |
| <i>Extraversion</i>               | -0.024*     | (0.013)  |
| <i>Openness</i>                   | 0.004       | (0.013)  |
| <i>Agreeableness</i>              | 0.038*      | (0.020)  |
| <i>Conscientiousness</i>          | 0.003       | (0.020)  |
| Control Variables—Interviewer     |             |          |
| <i>I_woman</i>                    | -0.123      | (0.140)  |
| <i>I_married</i>                  | -0.280*     | (0.149)  |
| <i>I_college</i>                  | 0.275       | (0.192)  |
| <i>I_exp</i>                      | -0.055**    | (0.023)  |
| Control Variables—Respondent      |             |          |
| <i>R_woman</i>                    | 0.564***    | (0.174)  |
| <i>R_married</i>                  | 0.112       | (0.159)  |
| <i>R_jr_hi</i>                    | 0.195       | (0.370)  |
| <i>R_coll</i>                     | 0.046       | (0.171)  |
| <i>R_refusal</i>                  | 1.329***    | (0.153)  |
| <i>R_Taipei</i>                   | 0.370       | (0.233)  |
| <i>R_Kaohsiung</i>                | 1.377***    | (0.289)  |
| <i>R_city</i>                     | 0.088       | (0.231)  |
| <i>R_township1</i>                | 0.469       | (0.311)  |
| <i>R_township2</i>                | 0.246       | (0.239)  |
| <i>R_township3</i>                | 0.635***    | (0.175)  |
| <i>R_township4</i>                | -0.347      | (0.235)  |
| Intercept                         | -2.958      | (1.662)  |
| First-level sample size           | 1,772       |          |
| Second-level sample size          | 57          |          |
| Var ( $\epsilon_{0j}$ )           | 4.6E-04     |          |

\*, \*\*, \*\*\* indicate two-tailed significance at 10%, 5%, 1% level, respectively.

action between the interviewer and respondent, no significant effect is found for conscientiousness. A neurotic interviewer tends to be more vulnerable and frustrated when confronted with a respondent's rejection. But similar to Jäckle et al. (2013) and Yang and Yu (2011), no significant association is observed between neuroticism and refusal. An open interviewer, as suggested by Jäckle et al. (2013), might be likely to be more understanding of the concerns and queries raised by the respondent. Nevertheless, openness turns out to be an insignificant factor for the probability of refusal, which is also consistent with the findings of Jäckle et al. (2013) and Yang and Yu (2011).

As to the controlled variables, their effects are almost the same as those in Table 2, with the exceptions being the interviewer-side marital dummy (*I\_married*), education dummy (*I\_college*), and respondent-side urbanization dummy (*R\_Taipei*). Because the signs of these variables remain the same and only their significance levels have changed marginally, the relevant findings shall not be repeatedly discussed here.

As indicated in Tables 2 and 3, there were 57 interviewers in the second-level of the HLM analysis. A reasonable concern is whether the number of interviewers is too small to obtain reliable estimates for the coefficients and standard errors.<sup>13</sup> The simulation results of Maas and Hox (1999) indicated that if the number of observations of the second-level is larger than 50, the maximum likelihood estimates of the coefficients and the asymptotic standard errors of HLM would be quite accurate. Therefore, the sample size in our analysis seems to be adequate for estimation as well as inference.

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13. We thank a referee for raising this point.

## V. Concluding Remarks

In this study, we have taken advantage of a panel study and its paradata for their rich information to look more precisely at the effects of the face-to-face interviewer's personality on the likelihood of refusal. Our findings indicate that the only two significant personality factors are extraversion and agreeableness. Extraversion has a significantly negative effect on the likelihood of refusal, while agreeableness acts oppositely. According to Barrick and Mount (1991), extraversion and agreeableness are the key personality traits contributing to the performance of occupations requiring social interactions. Our findings echo this proposition. In addition, these two findings are consistent with the results of Jäckle et al. (2013) on face-to-face interviewers in the UK. An extraverted interviewer is less likely to get a rejection, perhaps because he or she tends to have positive emotions and assertively and actively search for cooperation when faced with a defensive and reluctant sample person. As to the opposite effect of agreeableness, this is probably because an agreeable interviewer tends to be courteous, considerate and compliant, which makes it hard for him or her to persuade a reluctant respondent into accepting an interview.

Our finding on extraversion is similar to that of Yang and Yu (2011) on telephone interviewers of Taiwan. Yet the finding of positive association between agreeableness and refusal is different from the insignificant result of Yang and Yu (2011). A plausible cause for the difference is that the corresponding cost (either mentally or physically) for a respondent to take a face-to-face interview is much more than that of a telephone interview. In addition, a face-to-face interviewer has to confront the respondent in person

to complete an interview, which involves more social and communicative interaction with the respondent. An agreeable interviewer, seeking a harmonious interaction with the respondent, may find it more difficult to persuade an unwilling respondent to cooperate when conducting a face-to-face interview.

Neuroticism, openness and conscientious are all found to be insignificant in our study. The result is in line with the argument of Barrick and Mount (1991) that, among the five factors, extraversion and agreeableness tend to exhibit higher associations with the job performance of occupations requiring frequent and intense social interaction. Nevertheless, the insignificance of neuroticism, openness and conscientious on refusal does not imply that these personality factors are not associated with other facets of interviewer performance (such as the quality of completed questionnaires).

The study has some implications for survey practice. First, it might be useful to administer a personality test in recruiting new interviewers, especially on the dimensions of extraversion and agreeableness. High (low) scores on the extraversion (agreeableness) suggest that the applicant might be suitable as a face-to-face interviewer. Second, within-organization interviewing experience is a contributing factor in reducing the likelihood of refusal. More experienced interviewers are expected to be more successful in gaining cooperation from the respondents. Third, compared to the respondent who is completely cooperative with the interview, a reluctant respondent is more likely to reject the interview in the next wave of the panel. For the converted respondents, survey practitioners may create some incentives (e.g., personalized advanced letter) to increase their probability of cooperation in the follow-up of a panel. Fourth, married interviewers are more likely to gain cooperation from the respondents, perhaps due to the topic of the sur-

vey. This implies that interviewer characteristics, when related to the theme of a survey, may make a difference in the completion rate of the survey.

This study can be extended in several directions. First, interviewer performance is measured by the likelihood of refusal in our analysis. Supposing data quality is the main concern, the crucial personality traits might be different. Second, our analysis is static in nature. It is worth exploring whether the influence of interviewer personality diminishes as a panel proceeds to its later waves. Third, this study does not take respondent personality into account. It would be interesting to investigate the interaction effects of respondent personality and interviewer personality. Through these extensions, the association between interviewer personality and survey outcomes can be better understood.

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