

Do personality and self-construal predict response style in self-rating scales?

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Abstract

Response bias has been identified as a threat to the generalizability of social science studies. Response bias can be divided into response set and response style. Although response bias has been discussed for years, limited research has focused on it. Response bias consists of response set, which is a content-dependent bias, and response style, which is a content-independent bias. In this study, focus is restricted to response style, which is rarely detected and is thus a greater threat to the validity of a survey.

The purpose of this study was to discuss four different response styles (extreme, acquiescent, disacquiescent, and mid-point), and to examine the impact of personality traits (indecisiveness, dichotomous thinking, introversion, and pessimism) and self-construal on response styles. In a 2x2 design, 159 undergraduate students in Hong Kong were divided into two groups based on their predominant self-construal and were randomly assigned to receive either collectivistic-prime or individualistic-prime.

Our findings were that (1) indecisive individuals were significantly more likely to exhibit mid-point response style; (2) individuals with a higher level of decisiveness and lower level of dichotomous thinking were more likely to exhibit extreme response style; (3) introverted individuals were more likely to exhibit disacquiescence response style, and the relationship was mediated by pessimism; (4) self-construal predicted neither extreme nor acquiescence response style.

The results suggested that personality is an effective predictor of response styles. The implications of the results and the limitations of the study are discussed.

Introduction

Surveys are almost a way of life, from formal ones, e.g. customer preference surveys, government surveys, personality surveys, to less formal ones, e.g. surveys conducted by the television stations in Hong Kong which collect data from people who watch their programmes via mobile phone. Although there are numerous ways to collect data (observation, questionnaire interview, case study, etc.), the questionnaire is the most popular (Moors, 2010). This is because social science values the generalizability of the

results (Gall, Borg, & Gall, 1996). A case study can give detailed information but it can hardly be generalised to a large population, whereas questionnaire surveys can (Flyvbjerg, 2006). People fill out questionnaires to express their attitudes and behaviours. One of the most frequently used questionnaire formats is the rating scale (Moors, 2010). This format has its shortcomings, however. The data collected from participants might not reflect their real opinions because of response bias (Paulhus, 1991). If the response bias is minimised, we can be more confident about using the data. Although the concept of response bias has been around for many years (e.g. Jackson & Messick, 1958; Light, Zax, & Gardiner, 1965; McGee, 1962), little research has focused on it. In order to minimise response bias, the rationale behind it should first be identified.

Literature Review and Formulation of Hypotheses

Response Bias

It is known that any observed variance in a survey can be divided into two parts – true variance and error variance. True variance is the real variance that we want to measure and the changes owed to the effect of predictors (Bakeman & Robinson, 2005). Error variance can be further divided into random error and systematic error (Cote & Buckley, 1987).

Random errors are unpredictable noise and cannot be controlled individually, but they can be reduced by increasing the total number of observations. Systematic errors are predictable and affect test validity (Gibson, 2005). They are caused by factors that systematically affect the results across participants. There are two main sources of systematic errors: sample selection and response bias.

One of the sample selection errors comes from the sampling method. If random sampling is adopted, the sample selection error can be minimised. If, however, non-probability sampling methods, e.g. consecutive sampling and snowball sampling, are employed, the sample may not be representative and may lead to systematic error (Gibson, 2005).

Response bias is defined as ‘a systematic tendency to respond to a range of questionnaire items on some basis other than the specific item content’ (Paulhus, 1991, p. 17). It clearly shows that the response made cannot represent the individual’s real opinion. Therefore, response bias should be avoided. To avoid it successfully, the nature of it should be understood. Response bias can be decomposed into response set and response style (Paulhus, 1991).

Response Set

The response set is the conscious or unconscious desire of participants to respond to survey items based on the content of the questions in order to act like others (Rorer, 1965). The most popularly exhibited response bias is the desirability response set. Everyone has their own general concepts of socially undesirable attitudes (e.g. drug abuse,

drunken driving, and suicide) and socially desirable attitudes (e.g. loving others, church attendance; Groves, 1989). To conform to the societal norms, people may present themselves desirably regardless of their real self. That is, they overrate the socially desirable attitudes or behaviours and underrate the socially undesirable attitudes and behaviours (Randall & Fernandes, 1991).

The response set can have great impact on the occupational field. Many companies use personality tests as one of their interview procedures because personality is a good predictor of whether the employee can integrate into the company's culture (Bowen, Ledford, & Nathan, 1991). Also, there are questions asking for comment about ethical business behaviours, e.g. 'Ethical practices are good business in the long-run' (Brown & King, 1982, p. 15). Faced with these types of questionnaires, people are more likely to reject the socially undesirable answer in order to be hired (Bowen et al., 1991; Randall & Fernandes, 1991). Such bias threatens the validity of the tests.

Response Style

The response style (RS) is the tendency of participants to answer in a certain direction, regardless of the content of the survey. RSs have been shown to be consistent across the single questionnaire (Javaras & Ripley, 2007) and affect the validity of research conclusions (e.g. Baumgartner & Steenkamp, 2001; Dolnicar & Grun, 2006; Gilman et al., 2008).

Different types of response styles have been reported in the literature (see Baumgartner & Steenkamp, 2001). Acquiescence response style (ARS) is the tendency of participants to give positive responses to the items and avoid negative response (e.g. slightly agree, agree, and strongly agree). Extreme response style (ERS) is the tendency of participants to give responses at either end-point of the scale (e.g. strongly agree or strongly disagree). Mid-point response style (MRS) is the tendency to give a middle-category response. Mild response style (MLRS) is the tendency not to give extreme responses. Disacquiescence response style (DARS) is the tendency to give negative responses (e.g. slightly disagree, disagree, and strongly disagree). Net acquiescence response style (NARS) is the tendency to show more agreement than disagreement, and response range (RR) is the range of response categories.

It is founded that response set can be detected by using a lie score, for example, the Need for Closure Scale (Roets & Van Hiel, 2007) consists of few items testing the response bias. On the other hand, response style is harder to detect because there is not such a method to detect it. It is thus more threatening to the validity of a survey. In our study, only response style was investigated. All seven RSs stated above are commonly discussed in the literature but not all will be examined in this study. ERS is simply the opposite of MLRS. Also it is highly correlated with RR, so it is logical that the RR is larger when the responses are 'strongly disagree' and 'strongly agree' than when the responses are 'neither agree nor disagree' (Baumgartner & Steenkamp, 2001). Also,

NARS is simply the proportion of ARS to DARS. Therefore, we will only discuss ERS, ARS, DARS and MRS, but not MLRS, RR, or NARS in our study.

Factors Associated with Different Response Styles

Personality Factors

The effect of personality on RSs was overlooked for years (Rorer, 1965). Weijters, Geuens, and Schillewaert (2010a), however, proved that ARS, DARS, MRS, and ERS were stable in their one-year longitudinal study, suggesting that personality is a possible factor for RSs.

Previous studies have found that ERS, ARS, NARS and MRS are associated with personality trait, e.g. intolerance of ambiguity (Hamilton, 1968; Naemi, Beal, & Payne, 2009), tendency to simple thinking (Naemi et al., 2009), and introversion (Couch & Keniston, 1960). The results are mixed, however. A recent study used peer evaluation to predict participants' RS (Naemi et al., 2009), but the methodology itself was problematic. Everyone has a tendency to exhibit RS, so using a possibly biased result obtained with peers to test a participant's response bias was self-contradictory. Therefore, the result might not be conclusive. More research is needed to identify the possible factors. The literature suggests three novel predictors.

Indecisiveness

Indecisiveness is chronic difficulty experienced in any form of decision-making (Crites, 1969). Indecisive people are characterised as decision-making-avoidant and experience uncertainty during the decision-making process (Germeijs & De Boeck, 2002). In Rassin and Muris's (2005) study, indecisive participants chose 'do not know' more often than decisive participants, which confirmed the avoidance of decision-making. On the other hand, Thompson, Naccarato, and Parker (1989) noted that decisive people are more confident in their decisions and find it easier to make decisions (as cited in Naemi et al., 2009). Therefore, they are more likely to give firm responses. Moreover, decisiveness and assertiveness are emphasised in masculine culture (Hofstede, 1998), which has been found to correlate with ERS (e.g. Johnson, Kulesa, Cho, & Shavitt, 2005; De Jong, Steenkamp, Fox, & Baumgartner, 2008). Although one study has shown the effect of decisiveness on extreme response style (Naemi et al., 2009), because of possible error in the research method further work is needed to confirm the relationship. It is hypothesised that (1) *individuals who scored high in indecisiveness are more likely to exhibit MRS, whereas strongly decisive individuals are more likely to exhibit ERS.*

Introversion and Pessimism

Introverts focus more on their internal world (Myers, 1962) because of lower thresholds of arousal (Eysenck, 1967). Therefore, they enjoy spending time alone rather than being accompanied by a large group of people (Myers, 1962). It is suggested that they do not

need to flatter people in order to gain friendship. There is research showing that introversion is negatively correlated with agreeableness (Carlo, Okun, Knight, & de Guzman, 2005), which relates to a soft-hearted, modest, trusting, and altruistic personality (McCrae & Costa, 1999). In the light of this argument, it is hypothesised that (2) *introverts are more likely to exhibit DARS than extroverts.*

Furthermore, introverts are known to be more pessimistic (Zeidner, 2010). Pessimism is defined as a generally negative attitude towards events (Chang, Chang, Sanna, & Hatcher, 2008). Also, they tend to be doubtful (Carver & Connor-Smith, 2010). Therefore, it is suggested that they may not easily agree with people and they are more likely to exhibit DARS. A possible mechanism among the three variables, introversion, pessimism, and DARS obtains: introversion predicts pessimism which in turn predicts DARS. Therefore, it is hypothesised that (3) *the association between introversion and DARS is mediated by pessimism.*

Dichotomous Thinking

Dichotomous thinking, also known as absolutistic or all-or-nothing thinking, is defined as 'judgments about oneself, personal experiences, or others are placed into one of two categories' (Wright, Basco, & Thase, 2006, p.11). People with absolutistic thinking are more likely to use 'always', 'never', and 'every', and they view the world in black and white. This construct is similar to intolerance of ambiguity, which is related to ERS (Naemi et al., 2009). Intolerance of ambiguity is defined as 'the tendency to perceive ambiguous situations as sources of threat' (Budner, 1962, p. 29). When they encounter threatening situations, people react cognitively, emotionally, and behaviourally (Grenier, Barrette, & Ladouceur, 2005). However, it is suspected that the extreme response style is correlated only with cognitive inflexibility rather than a package of cognition, emotion and behaviour because filling in questionnaire is a cognitive process. Given that ERS adoption is the conversion of the Likert scale into dichotomist questions (i.e. yes/no questions) it is hypothesised that (4) *people with a higher score on dichotomous thinking will have a higher proportion of extreme responses.*

Investigating the relationship between personality variables and response styles can help minimise the response bias within culture. A recent meta-analysis of response style (Vaerenbergh & Thomas, 2012), however, observed that personality factors explain less than 10% variance of RS. More than half of the variance of RS may be explained by country/culture level. Also, studying the relationship between culture and RS can help to minimise the response bias between cultures, which is beneficial to cross-cultural research.

Self-construal

To compare cultures, it is useful to describe them in terms of individualism and collectivism. Asian cultures have been categorised as collectivistic cultures and Western

cultures as individualistic (Triandis, 1990). There is research showing that RS varies across cultures but the results are mixed. Some studies show that cultures scoring high on individualism are positively associated with ERS (De Jong et al., 2008; Gilman et al., 2008), some show no effects on ERS or ARS (Grimm & Church, 1999), and some show a negative relationship between individualism and ARS and ERS (Harzing, 2006). Also, cultures scoring high on collectivism are reported to be positively associated with ARS and ERS (Harzing, 2006). This supported the idea that interdependent self-construal is linked to collectivism and independent self-construal is linked to individualism (see Gudykunst et al., 1996); it is suspected that the rationale behind the mixed results for collectivistic and individualistic culture is self-construal.

Self-construal was introduced by Markus and Kitayama (1991), who compared the construct of self in Western and Eastern cultures. They recognised two types of self-construal. Western cultures encourage independent self-construal. The characteristics of independent self-construal include expressing oneself, being unique, and promoting individual goals. People with independent self-construal compare with others for self-evaluation. In contrast, Eastern cultures encourage interdependent self-construal. The characteristics of interdependent self-construal are fitting in with a group and maintaining harmonious relationships in the group. In order to maintain a peaceful relationship, one would try to avoid giving a negative response, because it might produce conflict (Osula & Irvin, 2009). Confucius's thought is also influential in Chinese culture. Confucius advocates the Golden Mean, which means never being too extreme, so as to maintain good interpersonal relationships. From these two perspectives, it is hypothesised that (5) *interdependent self-construal will lead to a higher score for MRS and ARS, and a lower one for ERS.*

Bicultural Participants

To test the effect of self-construal on RS, bicultural participants were recruited. In previous cross-cultural studies, between-culture comparison was conducted (e.g. Dolnicar & Grun, 2006; Gilman et al., 2008). The results of these studies, however, may be confounded by variables such as language proficiency. Therefore, within-culture comparison is urged. According to Hong, Morris, Chiu, and Benet-Martinez, (2000), when exposed to Chinese and Western culture primes, Westernised bicultural Chinese will shift their cognition according to the culture, i.e. when primed with East Asian cues, they exhibit East Asian behaviours and when primed with Western cues, they exhibit Western behaviours. In this study, participants were separated into two random groups. One group received collectivistic prime (COL-primed) and another group received individualistic prime (IND-primed). When the RS adopted by two groups of the same culture primed to different cultures were not the same, convincing evidence is provided that the cultural difference observed in RS is accounted for by self-construal.

Hong Kong, a former colony of Britain, is deeply influenced by Western culture while maintaining its inherent relationship with China. The two cultures converge and make Hong Kong a unique city where collectivism and individualism coexist (Ng, 2007). To provide a suitable background for a bicultural study (Ng & Lai, 2009), bilingual university students were invited to participate in the present study.

Methodology

Design

This study was composed of two parts. The first part differentiated the participants with predominant collectivistic self-construal from those with predominant individualistic self-construal. Then, in the second part, the groups with predominant collectivistic and predominant individualistic self-construal were randomly assigned to receive one of the two priming procedures in equal numbers. Therefore, there were altogether four experimental cells in a 2 (collectivistic versus individualistic self-construal) x 2 (individualism-primed versus collectivism-primed) factorial design.

This procedure ensured that the effect came from priming rather than participants' original self-construal. Participants were assessed by filling in self-report questionnaires.

Participants

In this study, 212 participants were recruited through convenience sampling. All of them were bilingual university students from universities in Hong Kong. For the purpose of dividing the participants into two groups, six participants without self-construal tendency, i.e. scoring zero on the self-construal scale, were excluded from further analyses. In the second wave of data collection, 159 responded, a response rate of 77%. Of the respondents, 47% were male and 53% were female, with ages ranging from 18 to 25 ($M = 21.0$, $SD = 1.32$).

Procedure

The study consisted of two waves. In the first wave, a consent form was signed by each participant before completing the questionnaire. Then they were asked to complete the Self-Construal Scale (SCS). After calculation of the SCS score, participants were divided into two groups according to their self-construal. Then they were given one of the two different sets of questionnaires (one with an individualistic priming procedure and one with a collectivistic priming procedure).

Materials

Self-Construal Scale. The Self-Construal Scale (SCS; Singelis, 1994) is designed to measure the strength of the individual's independent and interdependent self-construal. The scale consists of 30 items, rated on a seven-point scale (from 1= strongly disagree to

9 = strongly agree). The items can be divided into two dimensions, one for independent self-construal and one for dependent self-construal. Each dimension contains 15 items. For each participant, a single self-construal was obtained by subtracting the scores of the independent items from those of the interdependent items. Positive scores indicated independent self-construal and negative scores indicated interdependent self-construal.

Cultural Prime. According to Oyserman and Lee (2008), the Similarities and Differences with Family and Friends Task (SDFF; Trafimow, Triandis, & Goto, 1991, p.651) cues individualism, whereas the Sumerian warrior story (Trafimow et al., 1991) cues collectivism. These two priming methods were adopted.

SDFF. To prime individualism, participants were instructed to think about the differences between themselves and their family and friends. In contrast, to prime collectivism, participants were instructed to think about the similarities between themselves and their family and friends. They were asked to write down those differences and similarities to make sure that they were concentrating.

Sumerian Warrior Story. This has two versions, both of which describe how to choose a warrior. The main difference between the two versions is the rationale behind the choice, one focused on individual-talent (individualism-priming) and one focused on tribe-membership and family considerations (collectivism-priming). Participants were instructed to read the story and then made a judgment about the main character.

Dichotomous Thinking. The Dichotomous Thinking Inventory (DTI; Oshio, 2009) is designed to assess all-or-nothing thinking. The scale consists of 15 items rated on a six-point scale (from 1 = strongly disagree to 6 = strongly agree). This self-report scale contained three dimensions: (1) *dichotomous belief*, i.e. the belief that everything in the world can be categorised into two; (2) *preference for dichotomy*, i.e. the preference for conciseness, clarity, and distinctness; and (3) *profit-and-loss thinking*, i.e. reaping the benefits while avoiding the disadvantages. Each dimension consists of five items. The higher the score, the tendency towards dichotomous thinking will be higher.

Indecisiveness. The Indecisiveness Scale (IDS; Frost & Shows, 1993) is scored on a five-point scale ranging from 1 = strongly disagree to 5 = strongly agree. This scale consists of 15 items. The summed score shows the indecisiveness level of the individual, with a higher score representing a higher level of indecisiveness.

Introversion. The extroversion subscale in a 50-item set of the International Personality Item Pool (IPIP; Goldberg, 1999) NEO-PI was used to measure the introversion trait. It is a short version of the Big Five Inventory (John & Srivastava, 1999). There are 10 statements, with five reversed statements, concerning the extraversion dimension, ranging from very inaccurate to very accurate. The alpha reliability for extraversion is .87 (Goldberg et al., 2006). The introversive tendency score was obtained by summing all the items. The lower the scores, introversiveness will be higher.

Pessimism. The revised life orientation test (LOT-R; Scheier, Carver, & Bridges, 1994) consisting 10 items, rating on a five-point scale from strongly disagree to strongly agree. It is a unidimensional scale measuring optimism and pessimism, i.e. there is only one score indicating the optimistic or pessimistic tendency of a person. Three of the items were reversely scored, and the higher summed score indicated higher optimistic tendency.

Response style testing

To test response styles, self-esteem scales were employed. Self-esteem is not a personality trait, so it could not interact with the personality and affect the response styles. Also, the scales consist of an equal number of negatively worded and positively worded statements and are suitable for assessing ARS and DARS.

Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). The English version of the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) was employed. It is a 10-item scale measuring the self-esteem of individuals. Each item is answered on a four-point Likert scale, from 1= strongly agree to 4 = strongly disagree. In order to test RSs, however, the scale was adjusted to a seven-point scale, from 1= strongly disagree to 7 = strongly agree, and 4 = neither agree nor disagree.

The Chinese Adolescent Self-Esteem Scales (CASES) – General Self-Esteem subscale (GS). The CASES (Cheng, 2005) was developed for Hong Kong young people. It comprises a general evaluation of self-esteem and six-domain evaluations of the self-concepts. It is based on a seven-point Likert scale. In our study, only GS was employed because it measured the same construct as RSES.

Detection of the Response Style

ARS and DARS. In assessing ARS, the responses to the positively worded items were compared with negatively worded items. If the responses to positively (or negatively) worded items were rated from five to seven (showing agreement with the items) and negatively (or positively) worded items four (neutral), one point was given. Two points were given if the responses to both positively and negatively worded items were rated between five and seven. The scores were then summed to develop an index of ARS. Adoption of this method meant not only that the direction of response style could be detected, but also its magnitude. DARS was assessed by the same method, except that the scores were given to items rated between one and three rather than five to seven.

ERS and MRS. The method used by Baumgartner and Steenkamp (2001) was adopted for assessing ERS and MRS. The extreme responding style was assessed by counting the frequency of extreme responses given. Every response of strongly agree or strongly disagree received a score of one, and others received a score of zero. The MRS was assessed by counting the frequency of mid-point responses rated.

Results

Descriptive Statistics

The demographic characteristics of the participants in the four groups are summarised in Table 1. The age range was narrow because the target participants were restricted to college students.

Table 1
Demographic information of participants in groups

Variables	Participants in Group				Total
	IND-trait, IND-primed	IND-trait, COL-primed	COL-trait, IND-primed	IND-trait, COL-primed	
Age (M ± SD)	21.2 ± 1.32	20.9 ± 1.52	21.1 ± 1.28	21.1 ± 1.27	
Gender (N, %)					
Male	15 (9.4)	15 (9.4)	24 (15.1)	21 (13.2)	75 (47.1)
Female	10 (6.3)	19 (11.9)	21 (13.2)	34 (21.4)	84 (52.8)
Year of study (N, %)					
Year 1	3 (1.9)	15 (9.4)	9 (5.7)	14 (8.8)	41 (25.8)
Year 2	12 (7.5)	2 (1.3)	26 (16.4)	15 (9.4)	55 (34.6)
Year 3 or above	10 (6.3)	17 (10.6)	10 (6.3)	26 (16.4)	63 (39.6)
Total (N, %)	25 (15.7)	34 (21.4)	45 (28.3)	55 (34.6)	159 (100)

Hypothesis testing

First Hypothesis. The first hypothesis examined the relationship between indecisiveness and ERS and MRS. It was expected that a higher score in indecisiveness would show MRS, whereas a lower score in indecisiveness would show ERS. The IDS cut-off was determined by the median, which was 42. As shown in Table 2, the independent t-test with the factor indecisiveness revealed that less decisive people were more likely to exhibit MRS than decisive people, $t(157) = 7.26, p < .001$; conversely, strongly decisive individuals were more likely to exhibit ERS than indecisive individuals, $t(157) = -3.73, p < .001$. Thus, the first hypothesis was supported.

Table 2
MRS and ERS means for decisive and less decisive participants

	Indecisiveness level		<i>t</i>	<i>Df</i>
	Decisive	Less decisive		
MRS	4.5 (3.15)	1.46 (1.82)	7.26***	157
ERS	0.83 (1.92)	2.63 (3.98)	-3.73***	157

Note. *** $p < .001$. Standard deviations appear in parentheses below means.

Second and Third Hypothesis. The hypothesis concerning the mediation effect of pessimism between introversion and DARS was tested via linear regression.

In accordance with Baron and Kenny (1986), a series of linear regression analyses were conducted to test the mediation effect. To establish a mediation model, four conditions must be met: (1) introversion must predict pessimism; (2) introversion must predict DARS; (3) pessimism must predict DARS significantly after controlling for introversion; (4) after controlling for pessimism, the effect of introversion to DARS must be reduced or become insignificant. If the effect is reduced to zero when introversion is controlled, perfect mediation is established. If, however, partial mediation occurs, i.e. the effect is not reduced to zero, a Sobel test (1982) is employed to determine if the reduction is statistically significant to indicate mediation (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

As shown in Table 3, introversion was significantly correlated with DARS ($\beta=0.209$, $p < .01$) and pessimism ($\beta=0.377$, $p < .001$), which supported the second hypothesis. Pessimism was positively associated with DARS ($\beta=0.228$, $p < .01$). After controlling for pessimism, the relationship between introversion and DARS became insignificant ($\beta= 0.123$, $p = 0.138$). The Sobel Test result suggested that mediation was established (Sobel $z = 2.430$, $p < .05$) (Figure 1).

Table 3
Mediation analysis on the effects of pessimism on the association between introversion and DARS

Test of mediation pathway	β	SE	95% CI
<i>Model: introversion-pessimism-DARS pathway^a</i>			
Introversion → DARS	0.209**	0.010	0.01, 0.05
Introversion → Pessimism	0.377***	0.056	0.18, 0.40
Pessimism → DARS (introversion controlled)	0.228**	0.014	0.01, 0.07
Introversion → DARS (pessimism controlled)	0.123	0.011	-0.01, 0.04
Sobel Test			$z = 2.43^*$

Note. β : standardised regression coefficient; SE: standard error; CI: confidence interval.

^aRegression equations were controlled for gender and age.

* $p < .05$; ** $p < .01$; *** $p < .001$

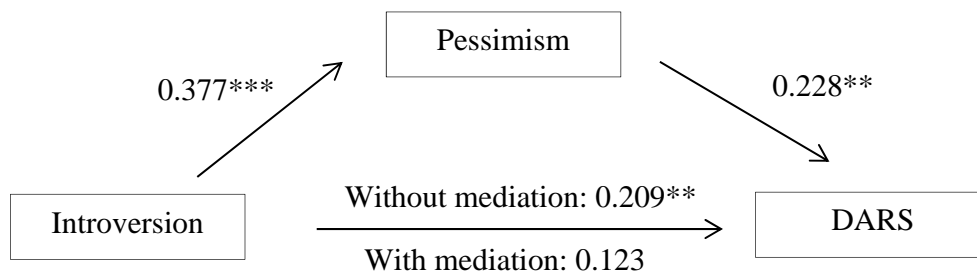


Figure 1. The mediation analysis for the relationship between introversion, pessimism, and DARS.

** $p < .01$; *** $p < .001$

Fourth hypothesis. The fourth hypothesis examined the relationship between absolutist thinking and extreme response style. It was expected that the higher tendency of dichotomous thinking would attract a higher proportion of extreme responses. The DTI was employed to test dichotomous thinking, and cut-off was determined by the median, which was 55. Independent sample t-test was employed to test the effect of dichotomous thinking on response styles. It was shown that individuals scoring low on dichotomous thinking were significantly more likely to show extreme response than individuals scoring high on dichotomous thinking, $t(157) = -2.09, p < .05$, which contradicted the fourth hypothesis. As DTI is composed of three subscales, when the relationship between the subscales and ERS was tested, it was found that only *dichotomous belief* correlated with ERS, $t(157) = -3.60, p < .001$.

Fifth hypothesis. It was hypothesised that individuals who received COL-prime would show MRS and ARS where those received IND-prime would show ERS. A two-way ANOVA was conducted to test the effect of self-construal and priming on the response styles.

For ARS, it had been shown that the main effect for self-construal, $F(1, 155) = 1.997, p = .16$, and priming, $F(1,155) = 0.416, p = .520$ were insignificant. The interaction effect was also not significant, $F(1,155) = 0.125, p = .724$.

The main effects for self-construal, $F(1, 155) = 0.020, p = .888$, and priming, $F(1,155) = 0.160, p = .690$, on MRS were not significant. Also, the interaction effect was not significant, $F(1,155) = 0.234, p = .629$.

Moreover, for ERS, the main effects for self-construal, $F(1, 155) = 1.549, p = .215$, and priming, $F(1,155) = 0.935, p = .335$ were not significant. The interaction effect was also insignificant, $F(1,155) = 0.481, p = .489$.

Overall, the fifth hypothesis was not supported.

Discussion

As set forth in the first hypothesis, more decisive people were significantly more likely to show extreme response style, which was consistent with the finding of Naemi et al. (2009), and less decisive people were significantly more likely to show mid-point response style, which was a novel finding. It is not unusual for people to fill in questionnaires with ‘neither agree nor disagree’ or ‘neutral’; an example is the Neuroticism-Extraversion-Openness Personality Inventory (NEO-PI; McCrae & Costa, 1999). As indecisive people are more likely to exhibit MRS than decisive people, if ‘neither agree nor disagree’ is not under investigation, it is suggested that it be omitted from the scale, which means using an even-point scale.

In addition, a novel model of pessimism, introversion, and DARS was established. After controlling gender and age, pessimism mediated the effects of introversion on disacquiescence response style. In line with the study conducted by Coughlin and Keniston (1960), introversion predicted DARS. Our study extended this relationship whereby introversion predicts pessimism which in turn predicts DARS. Specifically, the indirect prediction of pessimism for the introversion-DARS link was 0.086, suggesting that 7.7% of the prediction of introversion to DARS could be accounted for by the mediating effect of pessimism, whereas 92.3% of the prediction was direct. It suggests that the direct effect of the disposition trait introversion on DARS may be associated with personal attitudes, i.e. pessimism. The explanatory power of the model is relatively small, however, and possibly a more complex model including other mediating factors would better account for the DARS prediction. This awaits future development.

The third hypothesis was not supported but was indeed found to be reversely significant. The results showed that participants scored high on dichotomous thinking, particularly dichotomous belief, and were significantly less likely to exhibit ERS than those scoring low on dichotomous thinking. Dichotomous belief is the belief that everything in the world can be divided into two (Oshio, 2009). Even though people hold dichotomous beliefs, it does not necessarily mean they would view the world dichotomously. There is research showing that dichotomous belief is correlated with efficiency but not correlated with clear-headedness (Oshio, 2012). It is suggested that participants would finish the questionnaire quickly because of their efficiency. They do not have a clearer mind, however, than participants scoring lower on dichotomous belief. Therefore, they might adopt a ‘preservative’ approach to avoid extreme response and thereby decrease the risk of being wrong. Although both *agree* and *strongly agree* can be wrong (if disagree is the correct answer), people tend to answer *wrong* rather than *very wrong* (Spinelli, 1983). In short, participants with dichotomous belief completed the questionnaire efficiently with minimal errors; therefore, they are less likely to exhibit ERS.

This result was not consistent with previous studies (Naemi et al., 2009). Individuals who are less tolerance to ambiguity feel more threatened in uncertain situations, which in

turn induce a higher level of anxiety (Frone, 1990). Anxiety (Hamilton, 1968) and neuroticism were found to be associated with ERS (Iwawaki & Zax, 1969). Therefore, it is suggested that the relationship found in previous research which investigated the association between intolerance of ambiguity and ERS might be influenced by emotional factors. Further studies are needed to confirm this assumption.

Contrary to our expectation, self-construal did not predict acquiescent response style or extreme response style. The mixed results from previous studies concerning the cultural differences in response style cannot be accounted for by self-construal. Hofstede's (1980) cultural framework was composed of four dimensions, individualism/collectivism, uncertainty avoidance, masculinity/ femininity, and power distance, and studies have found that ERS is associated with them. For example, De Jong et al. (2008) found that ERS was positively correlated with individualism, uncertainty avoidance and masculinity, whereas Johnson et al. (2005) found that the four dimensions were all negatively associated with ARS and that power distance and masculinity were positively associated with ERS. These studies suggested that the interaction of the four dimensions might better explain the extreme and acquiescence response styles rather than just one or two dimensions out of four. This needs to be confirmed by future study.

This study helps to explain the nature of response styles. By discovering the response bias and their correlates, we can use the psychometric tests for different purposes with better reliability and validity. Scores obtained from the tests can be used to determine whether the quality or the behaviour of an individual is different from the norm. Given that the norm is produced by a large group of people, however, it might not be compatible with the individual. In simple terms, imagine there are two people filling in questionnaires about motivation and frustration for job interview. It has been found that personalities predict RSs. If the one, who is hardly motivated but easily get frustrated, has personalities favour in getting better score for these questionnaires, the company will hire the 'wrong' candidate. The situation might be even worse in clinical testing. If the results of the tests are influenced by the response bias, and potential mentally-ill individuals are classified as normal, the consequences can be serious. Therefore, the minimisation of response bias is very important. Our study result suggests that in order to increase the likelihood of an accurate reflection of a person's abilities and qualities, the personality of the interviewee should first be examined.

The effect of response bias is more or less unfavourable in marketing research. Most marketing research gathers data from the population by means of questionnaires using the Likert scale. Understanding the effects of personality on response styles provides important cues in terms of minimising the bias and thereby producing good marketing strategies which promote the company or the product. For example, when a promotion is evaluated, it is suggested that a simple introversive trait test should be carried out. Identifying the introversive individuals means their scores on the evaluation form can be calculated separately from those of extroversive individuals. If slight adjustments are

made to the scores, the effect of the promotion will not be degraded by the disacquiescence response style.

Limitations and Directions for Future Research

There are four limitations to be noted in this study. The first limitation is related to the samples. All the participants recruited in our study were undergraduate students in order to ensure their bicultural characteristic. This begs the question of whether personality is a factor in terms of the non-bicultural or those who are less educated or experienced in questionnaire completion. Therefore, generalisability to those people is limited. Also, although our results were highly significant, the sample size of our study was relatively small and might affect the generalisability. Therefore, further research with a bigger sample size would increase the robustness of our results.

The second limitation is related to the mode of data collection. There have been studies showing that response styles may be influenced by situational factors, such as the scale format (e.g. number of response categories; Weijters, Cabooter, & Schillewaert, 2010b), modes of data collection (e.g. telephone or paper-and-pencil survey; Weijter, Geuens, & Schillewaert, 2008), and interviewer effects (i.e. experienced or inexperienced interviewer; Olson & Bilgen, 2011), etc.

In our study, only the paper-and-pencil method was employed. This might not apply to surveys using electronic appliances like computers.

The third limitation is related to the language of the questionnaire. Most of the scales used in the study were in English, which was not the mother tongue of the participants. The English proficiency level of participants was different. Its effect on the response styles is unknown.

We did not find any significant differences between participants with collectivistic and individualistic self-construal or between participants receiving collectivism-priming and individualism-priming in extreme or acquiescence response. It might be caused by the second priming method – the Sumerian warrior story. Some participants expressed confusion about the story. The story is about a great man in ancient times making decisions with an individualistic or collectivistic mindset. The name of the person and the name of the land, let alone the reason for the decision, were alien to Hong Kong undergraduates and difficult to understand. When the story was not easily understood, the priming effect might not have been very significant. It is suggested that in future study, the story should be modified.

Furthermore, as mentioned earlier, individualism might not be the only factor that predicts response styles, as the other three dimensions in Hofstede's (1980) cultural framework might also play a part. Further study is needed to confirm the interaction effect of those dimensions in prediction of response styles.

Conclusion

In our study, we showed that personality traits, indecisiveness, dichotomous thinking, introversion and pessimism have a significant impact on different response styles. Yet the impact of self-construal on response style was not proved. This study not only shows the independent relationship between personality factors and response styles, but also reveals the possible mediation effect between the factors on RSs. Because of the limitations of the study, further work is required to elaborate the hypothesised effects. In order to test the effect of culture on RSs, a cultural priming method that suits Hong Kong people should be developed.

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