How are Previous Study Participation and Personality Related to Attitude Toward Online Study Information?

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PSBE3-BTHO: Bachelor Honours Thesis

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July 3rd, 2023

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Abstract

A study information form is an essential part of the consent procedure introducing participants to the study's purpose, procedure, and risks. Yet, previous research has shown that many participants neglect to fully read it. Attitude plays a major role in this behavior. This thesis investigated the attitude toward study information concerning previous related study participation, neuroticism, conscientiousness, and the number of past studies at the University of Groningen. In a short online survey completed by 293 participants, attitude was measured by asking participants to rate the importance of reading separate elements of the study information. Personality traits were assessed with the MIDUS II. To check whether participants were part of a previous study on informed consent conducted earlier in the year and involving a high and a low interactivity condition, identifying SONA numbers were compared. No hypothesized correlations were discovered between previous study participation and attitude. Only participants part of the low interactivity condition demonstrated higher attitude levels compared to those from the high interactivity condition and compared to new participants. Neuroticism and the number of past studies both did not correlate with attitude. Conscientiousness was found to be positively associated with attitude. This study shows that attitude plays a vital role in the issue of low reading of study information and that it is correlated with individual differences as well as situational factors like previous study participation. Further research should examine these factors in more detail to increase understanding of attitude toward study information and, thus, ensure reading.

Keywords: study information, attitude, neuroticism, conscientiousness, previous studies

How are Previous Study Participation and Personality Related to Attitude Toward Online Study Information?

As clarified by the Dutch National Ethics Council for Social and Behavioural Sciences (2018), all studies conducted at Dutch Universities in social and behavioral sciences must provide participants with information explaining the study's aim and consequences. This is consistent with the internationally recognized Belmont Report defining human subjects research guidelines which, in the U.S., must be supervised by Institutional Review Boards (IRBs) (U.S. Department of Health and Human Services, 1979; U.S. Department of Health and Human Services, 2009). This study information is usually presented as a form and sometimes referred to as a consent form. Though, since it does not describe the contractual part in which participants provide consent by signing or ticking a box but rather the information about the study, we will refer to it here as *study information form*.

A study information form must discuss several points, roughly summarized: Information about the researchers, the study's topic and purpose, the research procedures, risks and benefits for the participants, privacy-related matters like handling of personal data, and the participants' rights e.g., that participation is voluntary (The National Ethics Council for Social and Behavioural Sciences, 2018). Following the communication of this information, the participants are asked to provide consent to take part in the study and, if applicable, to the processing of their personal data (The National Ethics Council for Social and Behavioural Sciences, 2018).

This consent procedure is perceived as ethically correct as it puts the responsibility on the researchers as well as on the participants. The researchers must present participants with their study's details and ethical risks in an easily comprehensible manner while the participants must read what they are consenting to and make the conscious decision to participate or not (Nijhawan et al., 2013). However, this process only works with the

assumption that the participants actually read, and subsequently understand, the study information (Pedersen et al., 2011).

Indeed, past research has consistently shown that participants providing consent often neglect to fully read, remember, and comprehend the information presented during the consent procedure. For example, in a study conducted by Perrault & Keating (2018), most participants decided to only skim the information form (69%) or not read the form at all (21.2%). Perrault & Nazione (2016) found that almost half of their study's participants provided consent yet did not read the form beforehand. Naturally, someone who does not fully read the form is less likely to understand its content. This was supported by Perrault and Keating (2018) whose study depicted significantly higher comprehension for participants who fully read the information compared to those only skimming it. Comprehension was assessed through mostly open-ended questions on the content of the information form. Further, Varnhagen et al. (2005) found an average recall rate of under 10% for 55 content units in the study information across all participants. Lack of understanding is especially problematic when it comes to ethical and privacy-related risks for the participants. Alarmingly, in a study by Pedersen et al. (2011), it was shown that more than 33% of participants did not remember the study's risk information either directly after reading it or after completing a survey in between.

This challenge of reading neglect in study information forms is specifically pronounced in the online context. Assessing recall of information by comparing online vs. in-person environments, Pedersen et al. (2011) found that participants in the online condition were 50% less likely to recollect information than those in the in-person condition when measured directly after exposure to the form or after survey completion. A systematic review of interventions to improve understanding during informed consent established that in-person

interactions are the best method to increase comprehension of study information (Flory & Emanuel, 2004) which, however, is often not feasible.

With the Covid-19 pandemic, the number of online studies in psychological research has increased immensely (Pappas, 2021) which does not just involve studies with minimal risks but also potentially distressing studies like those employing the trauma film paradigm (James et al., 2016; Bücken et al., 2022; Gauthier, 2023; Jones & McNally, 2022). The trauma film paradigm describes an experimental approach to investigate responses to and symptoms of psychological trauma after presenting participants with traumatic films involving scenes of car accidents or violent conflicts, for example (James et al., 2016). This short-term induction of trauma symptoms can lead to significant distress which makes the participants' awareness of their rights and the study's risks even more relevant (James et al., 2016). To reduce negative consequences, James et al. (2016) emphasize the importance of careful briefing on the clip's character and the right to stop participation at any time. If feasible, the presence of a clinical professional is suggested to guide the study procedure and provide support if needed after the study. Since this is not possible in an online study, it is extremely important to understand the mechanisms behind the attitude toward reading study information, specifically in the online setting.

So far, most research investigated attitudes toward study information in terms of potential improvement approaches concerning length, detail, or structure of the form (such as in Perrault & Nazione, 2016; Perrault & Keating, 2018; Flory & Emanuel, 2004; Geier et al., 2021). Examining the effects of various changes to the information form (e.g., low reading level, spaces and bold, brevity) on reading or comprehension, Geier et al. (2021) found no significant results except for the high interactivity condition. Here, content questions were added after each segment of the study information and it was shown that interactivity could improve comprehension on specifically the content tested with the questions. Perrault &

Keating (2018) tested multiple adapted versions of the study information and found only small effects on understanding and the review by Flory & Emanual (2004) suggested that multimedia approaches to enhance comprehension do not provide reliable effects. This leads to the necessity to look for further approaches that could positively affect attitude on reading study information. Perrault & Keating (2018) discovered that the most common reasons why participants did not read the study information concerned a lack of attribution of importance to the form. 24.1% of the participants said they did not find it important to read such a form and, conversely, 41.8% indicated reading study information fully only when handling important issues (Perrault & Keating, 2018). This implies that participants must perceive the decision to take part in a study as an important matter which requires their careful attention and, thus, a thorough reading of the study information.

Though it has been established that participants' attitudes toward consent procedures play a vital role in increasing reading of study information (such as in Schouten et al., 2002; Valle-Mansilla et al., 2010; Rodriguez del Pozo, 2013), individual differences in reading, recall, or attitude have not been explored much yet. Geier et al. (2021) investigated participant self-efficacy and perceptions of researchers with regard to reading study information but did not find any significant associations. Pedersen et al. (2011) found a significant positive correlation between recall of information and autonomy orientation – that is, finding intrinsic motivation and interests in current activities. No significant association was found between recall and social desirability or conscientiousness. Nevertheless, it is well established that personality traits can affect attitude in various domains (such as in Lee et al., 2020; Khavari & Mabry, 1985; Friedman 2000; etc.).

Looking at specific personality traits, it has been supported that "healthy neuroticism" is positively associated with protective health behaviors like mindfulness of potential symptoms and keeping up with treatment (Friedman, 2000). Moreover, a strong positive

association was found between neuroticism and anxiety (Ormel et al., 2013), supposedly promoting less effective responding and hyperresponsivity to information linked to threat (Crow, 2019; Mathews, 1990). Related to consent procedures, it is reasonable to assume that the more neurotic people are, the more likely they are to read the study information to be aware of potential risks of an upcoming study.

Conscientiousness is a personality trait that strongly predicts better health outcomes and incorporates high levels of self-control, orderliness, and responsibility (Friedman, 2000; Roberts et al., 2014). This entails increased restraint, perseverance, and reliably complying with obligations (Spielmann et al., 2022) – all of which are relevant traits to follow through with the request of carefully reading study information. Further, conscientiousness was found to correlate positively with vigilance and perceptual sensitivity (Hadžiahmetović & Koso-Drljević, 2022; Rose et al., 2002) which could be important in information recall and comprehension.

One situational factor consistently found to negatively relate to attitude and reading behavior of study information is habituation. When Varnhagen et al. (2005) asked for reasons for only skimming or not reading the form at all, almost half of the participants (47%) stated that all study information involved similar content. This was confirmed by Geier et al. (2021) with a percentage of 20% saying they did not read the form because it is all the same. This effect could be explained by habituation suggesting a decrease in reading and attitude when participants have been exposed to comparable information in previous studies (Bravo-Lillo et al., 2014). At the University of Groningen, first-year psychology students are used as samples for a multitude of studies conducted at the Department of Psychology. As most recruitment of participants takes place through the SONA system, the studies are often referred to as *SONA studies*. The students gain partial course credits for participating in a SONA study and must collect a certain amount throughout the academic year to finish the course. Thus, this sample

is expected to habituate to information forms that are displayed in every study they participate in.

An online SONA study was conducted recently at the University of Groningen assessing the role of interactivity with the study information in relation to the retention of information (Perricci, 2023; Reichwein, 2023). It was designed following a study by Geier et al. (2021) which showed that interactivity can significantly increase understanding by directing attention to certain information during the consent procedure. To increase ecological validity, the study used an information form that was usually employed for an online trauma film paradigm study to measure the effects of different levels of interactivity on retention (Perricci, 2023; Reichwein, 2023). Participants were randomly assigned to a high vs. a low interactivity condition. In the high interactivity condition, knowledge questions were appended to each segment of the study information, depicted one after the other on separate pages. These questions had to be answered correctly to be able to go to the following page. No questions were present in the low interactivity condition while reading the study information, as done in usual practice. The questions that were part of the high interactivity condition, along with new questions about the study information, were asked to participants of either condition after having read the study information, to measure a difference in retention between groups. After the retention questions, the study involved a debriefing of the study's purpose and further questions on experiences with past SONA studies. Data collection took place from December 2022 until January 2023 and preliminary results have been made available within the university environment (Perricci, 2023; Reichwein, 2023).

A significant difference was found between interactivity groups regarding the questions asked during the retention test (Perricci, 2023; Reichwein, 2023). The participants in the high interactivity condition answered significantly more questions correctly than participants in the low interactivity condition. However, additional analyses revealed that this

was only true for the old questions, whereas there was no significant difference between groups with respect to the new questions that were not part of the high interactivity condition. It seems that there was no spill-over effect for participants in the high interactivity condition from answering questions while reading the study information to answering new questions afterward.

Irrespective of the results, this study hopefully led the participants to consciously engage with and reflect on the consent procedure. They were made more aware of the importance of reading and understanding the study information which can be seen as an attitude intervention – that is, the reflection on previous SONA studies and on their own attitude toward study information due to the debriefing and the survey. Due to the questions after each information segment, participants of the high interactivity condition were made to engage more carefully with the study information than those part of the low interactivity condition. Hence, an attitude intervention effect might be specifically pronounced for participants that were part of the high interactivity condition.

For simplicity and since no interactivity questions were present in the low interactivity condition, we refer to it here also as the non-interactive condition, while the high interactivity condition is referred to as the interactive condition.

The Present Study

This study aimed to measure attitude by asking participants to rate the importance of reading the separate sections of a study information form. Specifically in the online environment, it has been consistently demonstrated that many participants neglect to read study information fully, leading to ethical and privacy-related risks for the participants (Perrault & Keating, 2018; Perrault & Nazione, 2016; Pedersen et al., 2011). Emphasizing the relevance of attitude, a study by Perrault & Keating (2018) indicated that the most common reason for participants not reading the form is a lack of seeing the importance of doing so.

Factors influencing attitude toward study information might be previous related study participation, neuroticism and conscientiousness through their relations to threat-hyperresponsivity (Crow, 2019; Mathews, 1990) and perceptual sensitivity (Hadžiahmetović & Koso-Drljević, 2022; Rose et al., 2002) respectively, and habituation to the content of study information (Geier et al., 2021; Bravo-Lillo et al., 2014).

For this study, we employed a SONA sample of first-year psychology students at the University of Groningen. Since the data collection took place rather late in the academic year (April/May), it is likely that the participants have taken part in many SONA studies prior to this one.

In this study, we explored attitude to study information with regard to previous related study participation, relevant personality traits, and habituation based on the following hypotheses.

Hypothesis 1: Participants who took part in the previous study about informed consent report better attitudes toward information forms compared to participants who did not take part in the previous study.

Hypothesis 2: This (Hypothesis 1) is particularly true for participants who in the previous study were assigned to the interactive condition.

Hypothesis 3: Neuroticism is positively associated with attitude to study information forms.

Hypothesis 4: Conscientiousness is positively associated with attitude to study information forms.

Hypothesis 5: The more SONA studies participants have taken part in, the worse their attitudes to study information forms.

Methods

Participants

The survey was opened 306 times of which five cases were duplicate recordings – that is, participants who did the study twice. Starting with a data set of 306 cases, first, one preview case was taken out as this was a trial run by the researchers. Four more were filtered out for not consenting to participate or to the processing of personal data. The remaining four duplicate cases were excluded and finally, four remaining incomplete data were taken out. Thus, 13 cases were excluded from the data analysis leaving us with a total sample size of 293.

The 293 participants were Dutch or international first-year psychology students at the University of Groningen. Of those, 56 participants were part of the previous study as well – 29 in the interactive condition and 27 in the non-interactive condition, whereas 237 were not. All participants were recruited through the SONA participant pool by the University and signed up for the study of their own volition. Compensation took place via SONA credits which the participants required for their study program.

With the assumption of a power of 0.80 and an alpha of 0.05, we needed a minimum of 78 participants per group to detect a moderate effect for the first hypothesis. The aim was to recruit at least 156 participants. However, due to time constraints, data collection was stopped in mid-May and the goal of 78 participants per group could not be fulfilled. Thus, data analysis of hypothesis 1 will only yield results with a power of below 0.80.

Materials and Measures

Unstandardized Questionnaires

The main outcome variable of attitude toward study information was assessed by asking participants to indicate how important they find it to read the separate parts of the study information; comprising six items on the study's topic, procedures, burden,

compensation, privacy, and voluntariness. Ratings were measured using a Likert Scale (-2 = *Strongly Disagree*, 2 = *Strongly Agree*) (see Appendix A). As the overall outcome variable, the average across all six items was calculated. A Cronbach's alpha of $\alpha = .791$ of the survey element to measure attitude indicated acceptable internal consistency.

The number of past SONA studies was assessed by asking participants to estimate the number of SONA studies they participated in prior to the present study and to write it in a text box.

Standardized Questionnaires

To assess neuroticism and conscientiousness, the Revised Midlife Development Inventory Personality Scales (MIDUS II) was implemented (Lachman, 2005). This scale was generated as the shortest items-set to assess personality along six traits – Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism, and Agency – within five minutes (Lachman & Weaver, 1997). The Revised version holds high internal consistency reliability for all subscales and exhibits significant correlations with the NEO Short Form (Lachman, 2005). In the MIDUS II, participants are asked to indicate how well each of the thirty-one words (e.g. "outgoing", "curious", "worrying") describes them with a scale from 1 = *a lot* to 4 = *not at all* (Lachman & Weaver, 1997; Lachman, 2005). Its high reliability and low time effort are why we decided on employing this scale. In our survey, the subscales agreeableness ($\alpha = .845$), agency ($\alpha = .705$), openness ($\alpha = .747$), and extraversion ($\alpha = .782$) had either good or acceptable internal consistency while neuroticism ($\alpha = .658$) and conscientiousness ($\alpha = .679$) only demonstrated questionable internal consistency.

Procedure

The study was advertised and conducted online in the University SONA environment. Data were collected with a short online questionnaire of 10-15 minutes. After having signed up, the participants were presented with the study information and asked to consent to

participate and to the processing of their personal data. The study's purpose was stated straightforwardly, and no deception or blinding was involved. No demographic data were collected. The SONA numbers were the only identifiable information, obtained to give credits and to link these data to those of the previous study.

Besides overall attitude, the number of previous studies, and the personality traits, further informal questions were asked. These involve, for example, first participation in a SONA study, retention of study information in-person vs. online, and previous distressing experiences with SONA studies, as well as a modified version of the Reactions to Research Participation Questionnaire (RRPQ) to measure opinions about past experiences with research participation (Kassam-Adams & Newman, 2002). Note that the present thesis only includes results on overall attitude, the number of past SONA studies, and measures from the MIDUS II.

To finish the study and attain their SONA credits, the participants must have completed all questions and were then redirected to the SONA portal. The study was conducted in English. For further clarification on the procedure and the survey, refer to the registration on OSF (https://osf.io/atrj5).

Analyses

Hypothesis 1 was tested using a two-sided independent-samples t-test with an alpha of 0.05. The assumption of no significant outliers was checked by plotting two boxplots, one for the "new" and one for the "old" participants, as in those that were part of the previous study. Normality of attitude for each group was assessed through normal Q-Q plots and the Shapiro-Wilk test of normality. To check for homogeneity of variances, we conducted Levene's test of homogeneity of variances. In case any of the assumptions were not met and to ensure consistency in results, the Mann-Whitney U test was conducted as a nonparametric equivalent. See Appendix C for the graphs of the assumption checks.

To test hypothesis 2 and examine a difference in attitude between all three groups, we conducted a univariate Analysis of Variance (ANOVA). This analysis further distinguished between old participants depending on the condition they were in – that is, in the interactive or the non-interactive condition. To compare the three groups, post hoc tests with a Bonferroni correction were conducted, two-sided and with an alpha of 0.05. The same assumption checks were carried out as for hypothesis 1 and, as a nonparametric equivalent, we employed the Kruskal-Wallis test. Dunn's multiple comparisons tests were conducted in the case of a significant Kruskal-Wallis test. See Appendix D for the graphs of the assumption checks.

To test hypotheses 3 to 5 and examine the association between attitude and neuroticism, conscientiousness, and the number of past SONA studies respectively, we conducted linear regression analyses. Correlation coefficients and further regression results are reported with a two-sided t-test and an alpha of 0.05. We created scatterplots to check for linearity and significant outliers. The assumption of homoscedasticity was tested with a scatterplot of the residuals and a normal P-P plot was created to test for normality of the residuals. Spearman's rho was conducted as a nonparametric equivalent. See Appendix E, F, and G respectively for the graphs of the assumption checks.

For the analysis of hypothesis 5, 18 cases had to be excluded due to unrealistic high numbers of the number of previous SONA studies. Considering the number of hours that had to be completed with SONA studies and the time frame given in the academic year, we set the cut-off score at a maximum of 70 past studies. For the respective analysis, a sample size of 275 remained.

Additional analyses are reported under the results.

Results

After linkage with the data from the previous study (Perricci, 2023; Reichwein, 2023), the SONA numbers were removed, and the anonymized data were prepared for analysis. All data preparation and analysis were conducted in SPSS and the respective syntax, output, and data files will be uploaded on OSF (https://osf.io/atrj5).

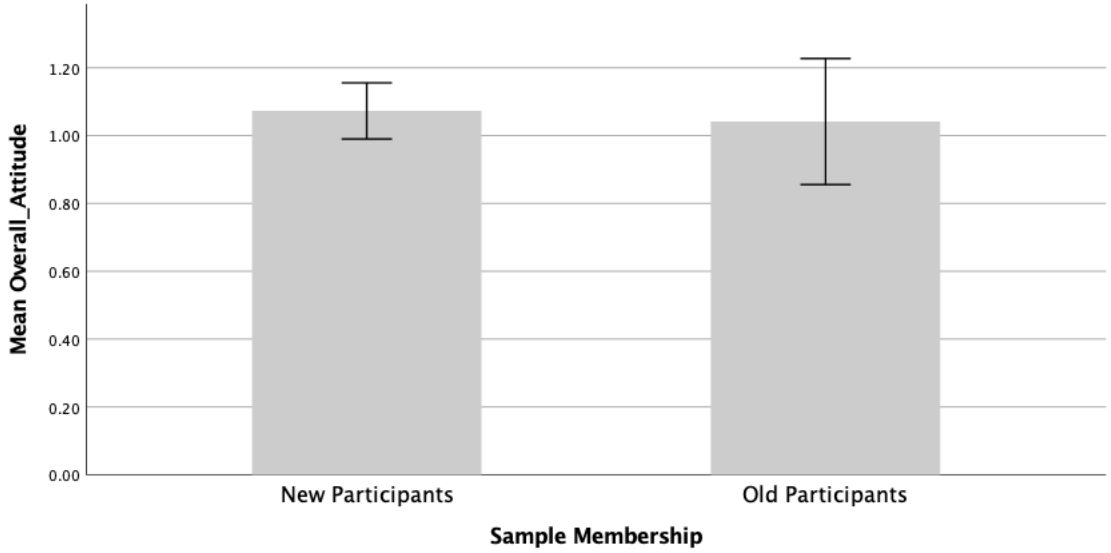
The distribution of scores on the main outcome variable of overall attitude toward study information across all participants (M = 1.1, SD = 0.7) was skewed to the right with one extreme outlier lying outside the ranges of (third quartile + 3 * interquartile range) and (first quartile – 3 * interquartile range) (see Appendix B). This individual indicated "Strongly Disagree" on all items of the attitude measure (see Appendix A). As this might still be a valid response, the outlier was included in the analysis. To account for it nevertheless, nonparametric equivalent tests were conducted for all hypotheses.

Hypothesis 1

The mean attitude level of the 56 old participants was 1.0 (SD = 0.7) while the mean attitude level of the 237 new participants was 1.1 (SD = 0.6) (see Figure 1). The difference between groups was not significant, $t(291) = .32$, $p = .747$, with an effect size of $d = 0.05$. However, according to the Shapiro-Wilk test, the assumption of normality was not met for the new participants ($W(237) = .94$, $p < .001$), nor among the old participants ($W(56) = .93$, $p = .002$). All other assumptions as well as the assumption of homogeneity of variances ($F(291) = .44$, $p = .509$) were met. Nonetheless, the Mann-Whitney U test was not significant ($U = 6597$, $p = .945$) and pointed towards the same conclusion. These results do not support the first hypothesis claiming that those who took part in the previous study about informed consent report better attitudes compared to participants who did not take part in the previous study.

Figure 1

Simple Bar Graph of Overall Attitude by Sample Membership



Note. Error bars are indicated using 95% confidence intervals.

Hypothesis 2

The assumption of normality was met for those that were part of the non-interactive condition ($W(27) = .94$, $p = .116$), but for neither the interactive condition ($W(29) = .89$, $p = .005$) nor for the new sample ($W(237) = .94$, $p < .001$). All other assumptions as well as the assumption of homogeneity of variances ($F(2, 290) = 1.51$, $p = .224$) were met. The ANOVA F test revealed a significant difference between groups with $F(2, 290) = 6.49$, $p = .002$ (see Figure 2).

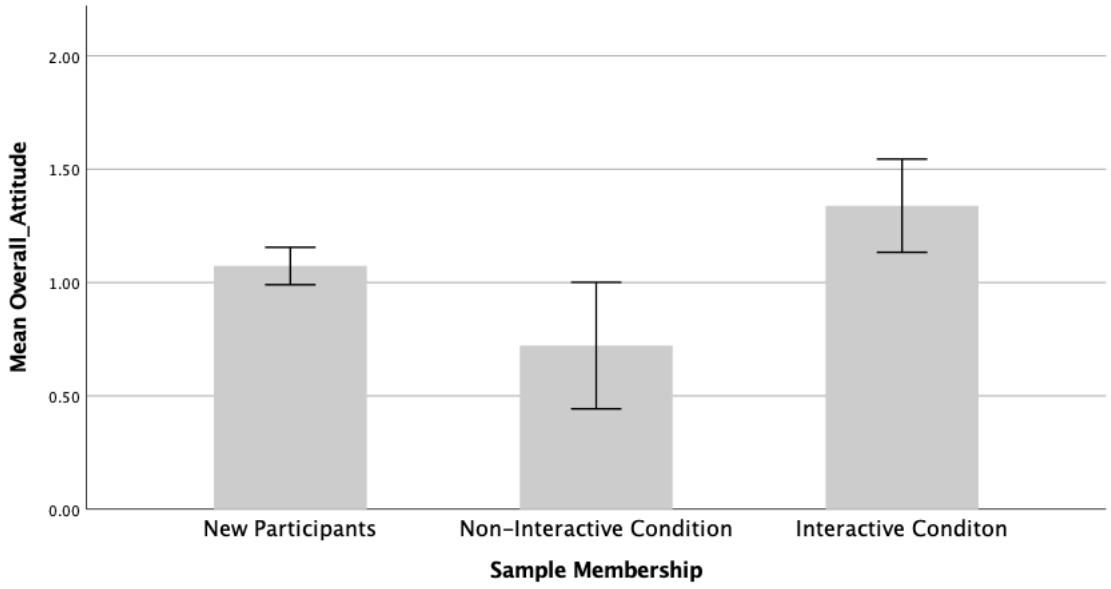
The sample of new participants attributed significantly more importance to reading study information than those in the non-interactive condition, $p = .023$. The interactive condition sample in contrast to the new participants found it more important to read study information, yet, without significance, $p = .109$. Comparing the two conditions, the interactive sample reported significantly better attitudes than the non-interactive sample, $p = .001$. For the mean and standard deviation of the three groups, see Table 1.

The Kruskal-Wallis test confirmed the model's significance ($H(2) = 12.55$, $p = .002$) and the significant differences between groups. Dunn's multiple comparisons tests were significant for the difference between the new and the non-interactive sample ($p = .014$, Bonferroni-adjusted $p = .04$) and for the difference between the non-interactive and the interactive sample ($p < .001$, Bonferroni-adjusted $p = .001$). They further depicted a significant difference between the interactive condition sample and the new participants ($p = .023$) though not when Bonferroni-adjusted (Bonferroni-adjusted $p = .07$).

These results do not confirm the second hypothesis. Instead of a group difference between new and interactive condition participants, we found a significant difference between non-interactive and interactive condition participants as well as between non-interactive condition and new participants.

Figure 2

Simple Bar Graph of Overall Attitude by Sample Membership



Note. Error bars are indicated using 95% confidence intervals.

Table 1

Descriptives of Overall Attitude Depending on Sample Membership

Overall_Attitude			
	N	*M*	*SD*
New	237	1.07	.65
Interactive	27	.72	.71
Non-Interactive	29	1.34	.54
Total	293	1.07	.65

Hypothesis 3

All assumptions for the analysis were met. Neuroticism (M = 2.5, SD = 0.6) did not predict attitude, $R^2 < .001$, $F(1, 291) = 0.04$, $\beta = .01$, $p = .842$. This non-significant result was confirmed when measuring Spearman's rho, $r(291) = .02$, $p = .771$. The third hypothesis is not supported and there does not seem to be evidence for a linear correlation between attitude to study information and neuroticism.

Hypothesis 4

To test the fourth hypothesis, all assumptions were met. Conscientiousness (M = 2.9, SD = 0.5) positively predicted attitude, $R^2 = .052$, $F(1, 291) = 15.9$, $\beta = .28$, $p < .001$. The same analysis with Spearman's rho replicated this outcome, $r(291) = .21$, $p < .001$. This clearly supports our fourth hypothesis and points towards a weak positive correlation between conscientiousness and attitude.

Hypothesis 5

All assumptions met, the number of past SONA studies (M = 26.2, SD = 11.1) did not predict attitude, $R^2 = .001$, $F(1, 273) = 0.31$, $\beta = .002$, $p = .578$, which was further confirmed by Spearman's rho, $r(273) = .01$, $p = .931$. Hypothesis 5 is not supported and there does not seem to be evidence for a negative correlation between attitude and the number of past SONA studies.

Additional Analyses

To check for potential confounders in hypothesis 2 in that some types of individuals may have been more likely to take part in the previous study and the respective conditions, we carried out three more ANOVA F tests. The independent variables from hypotheses 3, 4, and 5, neuroticism, conscientiousness, and the number of past SONA studies were set as outcome variables to test for a predicting effect of group membership – as in being part of the interactive condition, the non-interactive condition, or part of the new sample. With the number of past studies as the dependent variable, no significant difference between the groups was found ($F(2, 272) = 2.45$, $p = .088$). There was neither a significant difference between groups with neuroticism as the dependent variable ($F(2, 290) = 2.54$, $p = .081$), nor with conscientiousness as the dependent variable ($F(2, 290) = 0.57$, $p = .566$). These results indicate that none of the three variables can be seen as confounders for the correlation between group differences and attitude. Group membership does not account for differences in either neuroticism, or conscientiousness, or the number of past SONA studies.

As an extension to hypotheses 3 and 4, we ran a multiple linear regression analysis with all six personality traits as predictors. The model was significant with $R^2 = .091$, $F(6, 286) = 4.78$, $p < .001$. Conscientiousness still positively predicted attitude independent of the other traits and agreeableness ($M = 3.4$, $SD = 0.6$) was further found to positively correlate with attitude, $r(291) = .24$. Independent of the other traits, no other personality characteristics significantly predicted attitude to study information (see Table 2). This indicates that, regarding the main personality traits as differentiated by the MIDUS II (Lachman & Weaver, 1997; Lachman, 2005), only agreeableness and conscientiousness predict attitude toward study information.

Table 2

Regression Coefficients of Overall Attitude Depending on the MIDUS II Personality Traits

	Unstandardized Coefficients			
	B	*Std. Error*	*t*	*Sig.*
(Constant)	-.327	.355	-.920	.358
Agency	-.065	.089	-.730	.466
Extraversion	-.037	.099	-.379	.705
Agreeableness	.204	.087	2.341	.020
Openness	.110	.095	1.162	.246
Conscientiousness	.209	.074	2.817	.005
Neuroticism	.015	.065	.237	.813

a. Dependent Variable: Overall_Attitude

Discussion

In this study, we aimed to investigate attitude to study information with respect to previous related study participation and relevant personality traits, namely neuroticism and conscientiousness. Previous study participation refers to an online SONA study about informed consent that was conducted earlier in the year at the University of Groningen and that involved a high and a low/ no interactivity condition. The interactivity condition involved content questions after each segment while the non-interactive condition did not. Participants that were part of the previous study did not report a significantly better attitude toward study information than new participants who were not part of the previous study, refuting our first hypothesis. Distinguishing between conditions, those part of the interactive condition did not report a significantly better attitude than new participants which provided evidence against hypothesis 2. However, participants that were part of the non-interactive condition rated the reading of study information as significantly less important than both, the new participants and those part of the interactive condition (see Figure 2). The difference in

rating was larger between the two conditions than between the non-interactive condition and the new participants.

This unexpected finding of a particularly low attitude in the non-interactive condition sample compared to the interactive condition sample and the new sample could be explained by a selection bias. The number of past studies, neuroticism, and conscientiousness can be excluded as potential confounders due to insignificant results when analyzed as dependent variables of group membership. A selection bias in this context could mean that only a fraction of individuals that were part of the non-interactive condition decided to participate in this study due to individual differences. In the SONA advertisement, potential participants were informed that this study would be a follow-up to the previous one mentioned by name. It could have been that, seeing the SONA advertisement, primarily non-interactive condition participants with a negative attitude toward study information signed up for the study leading to the difference between groups.

However, it is too early to draw strong conclusions, and to gain more insight into this outcome, we should have looked at the separate items of the attitude measure. Attitude was assessed by asking participants to rate how important they find it to read the six separate parts of a study information – that is, the study's topic, procedures, burden, compensation, privacy, and voluntariness. As the burden part includes information on potential risks, attitude ratings might differ between participants specifically on that item. As indicated already, neuroticism is positively related to a hyperresponsivity to information linked to threat (Ormel et al., 2013; Crow, 2019; Mathews, 1990). Yet, attention to threat-related information might not only be increased for highly neurotic individuals but could depend on other variables as well. Group membership as in being part of the interactive condition, the non-interactive condition, or part of the new sample, might be one of these variables. For example, participants from the interactive condition might pay more attention to risk-related information due to increased

awareness of the topic in comparison to new participants. This is why an examination of the different item scores of the attitude measure between groups would have been important.

As for hypothesis 3, neuroticism was not significantly correlated with attitude to study information. This might be due to a lack of perceived threat in study participation. The hyperresponsivity to threat information, as indicated by Crow (2019), might not be present for highly neurotic individuals in SONA studies as they, like most others (Perrault & Keating, 2018), do not find importance in reading study information. Further, neuroticism as a personality trait might be too undifferentiated by itself with regard to health behaviors. The paper by Friedman (2000) points toward a nonlinear relationship in which individuals moderately high in neuroticism are likely to attain the most positive health outcomes in comparison to those at the extreme ends of neuroticism. Friedman (2000) distinguishes between two types of behavioral directions that neuroticism may initiate. The first type fosters frustration, resentment, and increasingly negative outcomes, while the second type – the "healthy neuroticism" – may lead neurotic individuals to be more vigilant and engage in protective behaviors. This indicates that neuroticism has many different facets, and instead of neuroticism overall, only the healthy, vigilant part and moderate levels of neuroticism might be relevant for the attitude toward study information.

The significant positive correlation of conscientiousness with attitude confirms our fourth hypothesis. Highly conscientious individuals who are characterized by a high sense of duty and self-control (Spielmann et al., 2022; Roberts et al., 2014) are more likely to have a positive attitude to study information than those low in conscientiousness. This outcome adds on to the results of Pedersen et al. (2011) who found no significant correlation between recall of information and conscientiousness. In that study, only two items were used to measure conscientiousness which might limit the measure's validity. Nevertheless, recall is objective and attitude is subjective. The results could indicate that recall and attitude function

independently of each other. While recall might not be related to conscientiousness, highly conscientious individuals could still be more likely to have a better attitude toward study information than those low in conscientiousness.

Hypothesis 5 proposing a negative correlation between the number of past SONA studies and attitude towards study information was not supported. The habituation effect implied by previous studies already (Varnhagen et al., 2005; Geier et al., 2021; Bravo-Lillo et al., 2014) was not replicated within the University SONA environment. In the study by Bravo-Lillo et al. (2014), the outcome variable to assess a habituation effect was the detection of change in the content of a displayed information field. It was found that the higher habituation to the information, the lower the performance on change detection. In this study, we examined attitude as the outcome variable to measure a habituation effect. These findings taken together indicate that habituation of behavior is different from habituation of attitude. Though many participants report not reading study information due to similarity in content across the forms (Varnhagen et al., 2005; Geier et al., 2021), this attitude might not change much over time and is independent of the number of past studies.

Beyond testing the five hypotheses, we found a significantly positive correlation between attitude and agreeableness which might be due to the prosocial tendencies inherent to high levels of agreeableness (Graziano & Eisenberg, 1997). Prosocial manners are described as unsolicited actions for the benefit of someone else (Graziano & Eisenberg, 1997). Related to attitude toward study information, highly agreeable individuals might find it more important to read the form to help the researchers collect data properly than those low in agreeableness. Agreeableness and conscientiousness as personality traits might have additive facets that both contribute to a positive attitude to reading study information. When looking at the items with which conscientiousness and agreeableness are measured in the MIDUS II, some words seem to be related in meaning. For example, items such as “helpful”

and “caring” are used to measure agreeableness, and items like “responsible” and the reverse score of “careless” are used to assess conscientiousness (Lachman, 2005). A paper on the factor structure of the MIDUS demonstrated factor correlations between agreeableness and conscientiousness as high as $r = .468$ with $p < .001$ (Joshanloo, 2018). To know which facets of agreeableness and of conscientiousness are the ones contributing most to a positive attitude toward study information, we should have examined the separate MIDUS II items scores for the two traits in more detail.

Limitations and Future Directions

When discussing the results of this study, it is important to take its limitations into careful consideration. As mentioned in the methods section, a minimum of 78 participants per group to detect a moderate effect with a power of 0.80 was not attained for hypothesis 1. Low power leads to a decreased chance of detecting a real effect and respective interpretations must be viewed critically. For hypothesis 2, only 29 participants were part of the interactive condition, and 27 were part of the non-interactive condition. Though we found a difference in attitude between the non-interactive condition sample and the interactive condition, as well as between the non-interactive condition sample and the new sample, this finding might not replicate with a larger sample due to the small sample sizes. Deficient power is a clear limitation to the informative value of the findings of hypotheses 1 and 2. Large enough sample sizes to obtain a power of 0.80 should be ensured for subsequent studies in the field to be able to come to well-grounded conclusions.

Examining the correlation between neuroticism and attitude for hypothesis 3, this thesis only explored a linear relationship. However, as implied by Friedman (2000), there might be a nonlinear relationship when relating neuroticism to health behaviors. In this case, the health behavior is having a positive attitude to reading study information to be aware of potential risks. Weston & Jackson (2017) found that the correlation between neuroticism and

good health is moderated by body vigilance implying that higher body vigilance might be correlated with neurotic individuals behaving more healthily. When controlling for vigilance, neuroticism correlated with unhealthy actions (Weston & Jackson, 2017). Future research should take a closer look at a nonlinear relationship between neuroticism and attitude toward study information, and take vigilance into account during this examination.

With hypothesis 4 and some additional analyses, this paper looked at the main associations of personality traits on attitude to account for the role of individual differences. To attain a more in-depth understanding of the correlations between conscientiousness, agreeableness, and attitude, and to reveal potential moderators, interaction correlations could have been investigated. As demonstrated by Joshanloo (2018), there are moderate factor correlations in the MIDUS between agreeableness and conscientiousness. It could very well be that the association between conscientiousness and attitude varies depending on the level of agreeableness, or vice versa, that attitude's correlation with agreeableness depends on conscientiousness. As this would have gone beyond the scope of this paper, we strongly encourage future research to examine the interactions between personality traits in relation to attitude to study information forms.

When exploring hypothesis 5, other variables besides the number of past SONA studies might play a role. Participants may have taken part in other studies apart from SONA, like paid studies or those advertised publicly at the university. Specifically asking about SONA studies reduced the timeframe of assessment and does not include studies that participants may have been part of before the start of the academic year. This could have been measured in more detail in the questionnaire but would have been too comprehensive and a deviation from the study's actual focus. Moreover, we did not assess how often people deal with other types of online agreements and their attitudes toward these situations. In a study by Perrault & Keating (2018), 42.8% of participants indicated only fully reading

information consent forms outside of a research setting, for example when making large purchases. Future research should take a closer look at attitude and how it is related to past exposure to study information and other types of online agreements. This would help in distinguishing further between the time and type of the information encounters when examining their associations to attitude toward study information.

This study mainly examined attitude toward reading study information in the online environment. As suggested by Pedersen et al. (2011) and the review by Flory & Emanuel (2014), there is a difference in recall and comprehension of study information in online vs. in-person research. This is likely to be the case for attitude towards study information as well. This is why we propose a replication of our study in-person or further research directly assessing the difference in attitude between reading study information in an online vs. an on-site environment.

This paper's analysis relied solely on self-report data. As is widely acknowledged, this can entail social desirability response bias (Randall & Fernandes, 2013) and inaccurate information due to lacking memory of past events. For example, some participants might indicate higher attitudes toward study information than is the truth because this is more socially desirable. When asked about the number of past studies, participants were likely to give rough estimations which might differ significantly from the actual number of past studies. This noise in data is difficult to overcome when it comes to reporting attitude. However, the number of past studies may be determined by researchers in the University SONA environment through the SONA numbers as identifiers. Future research could implement this method to obtain more accurate data on potential habituation.

Theoretical and Practical Implications

This study significantly contributes to tackling the issue of research participants' neglect in reading study information before providing consent to participate (Perrault &

Nazione, 2016) by increasing insight into the role of attitude. Previous research mostly focused on improvement approaches such as Perrault & Keating (2018), Flory & Emanuel (2004), and Geier et al. (2021), however, without an understanding of the actual reasons behind reduced reading. This is the first study to investigate attitude in more detail in relation to previous related study participation and personality.

The findings of this thesis imply that reinforced awareness of the importance of reading study information may be relevant for attitude, even if not in the way that we had hypothesized here. It could not be supported that increased reflection in the previous study positively influenced attitude in the long run over the whole sample. Yet, participants from the non-interactive condition reported significantly worse attitudes than the interactive condition participants and the new participants. This shows that increased awareness of the issue might be important for attitude in one way or the other which leaves room for further exploration and provides a good start for follow-up research.

The study further depicted the relevance of certain personality traits on attitude to reading study information. There seems to be less of a challenge for individuals high in conscientiousness and/ or agreeableness to see the importance of reading such forms. The subsequent implication is that study information should either be adapted to individuals low in these traits or, before displaying the information, elements of conscientiousness or agreeableness could be short-term induced in the participants by fostering behavioral commitment. For example, as done in environmental psychology research (Steg et al., 2017), before seeing the form participants could be asked to write down or sign statements on the importance of reading study information as a formal agreement to act accordingly. This could elicit relevant facets like helpfulness and responsibility in the participants (Roberts et al., 2014, Graziano & Eisenberg, 1997) and promote a positive attitude, increasing the likelihood of reading the information.

The lack of replication of the habituation effect (Geier et al., 2021; Bravo-Lillo et al., 2014) for attitude suggests that a positive attitude toward study information can sustain without being impacted by the number of past studies. This implies that attitude must be of primary focus when working on getting more participants to read study information. Participants must be reminded of the importance of reading the form for every study anew. Specifically in the University SONA environment, such a reminder could be introduced at the beginning of the course that requires study participation and at every following block start.

Conclusion

Attitude is central to the issue of few research participants fully reading study information before providing consent. This thesis found that attitude toward study information differs between individuals depending on the level of conscientiousness and agreeableness. The higher the levels of either personality trait, the better the attitude. Further, it was supported that attitude toward study information sustains over time within the individual independent of the number of previous SONA studies. Previous participation in related studies on the consent procedure may play a role in attitude but must be investigated further in future research. The findings suggest forms of behavioral commitment to be implemented at the beginning of every study information by letting the participant write and sign a formal statement on the importance of reading study information. Further, regular reminders on the purpose and relevance of study information should be introduced, specifically in a university environment. Future research should keep examining attitude toward study information to further increase insight into its role in reading study information.

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Appendix A

Measurement of Attitude

Current attitudes towards information forms were assessed using the mean across the following items in the online survey. The responses were measured with a Likert Scale (-2 = *Strongly Disagree*, 2 = *Strongly Agree*).

Please indicate how strongly you agree or disagree with the following statements on your attitude toward information forms. With "study information" we mean the information provided during the consent procedure, right before you consented to participate.

I think it is important to read the following parts of a study information:

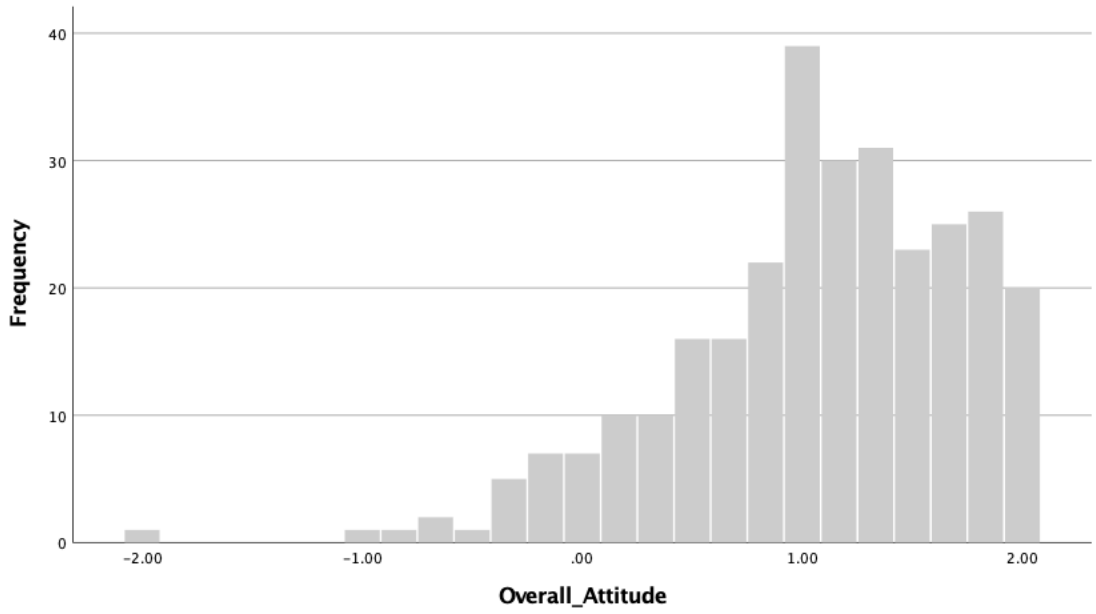
- What the research is about (topic)
- What is being asked of me (procedures)
- What the risks of participation are (burden)
- What the benefits of participation are (compensation)
- How my data is being handled (privacy)
- What my rights as a participant are (voluntariness)

Appendix B

Main Outcome Variable of Overall Attitude

Figure 3

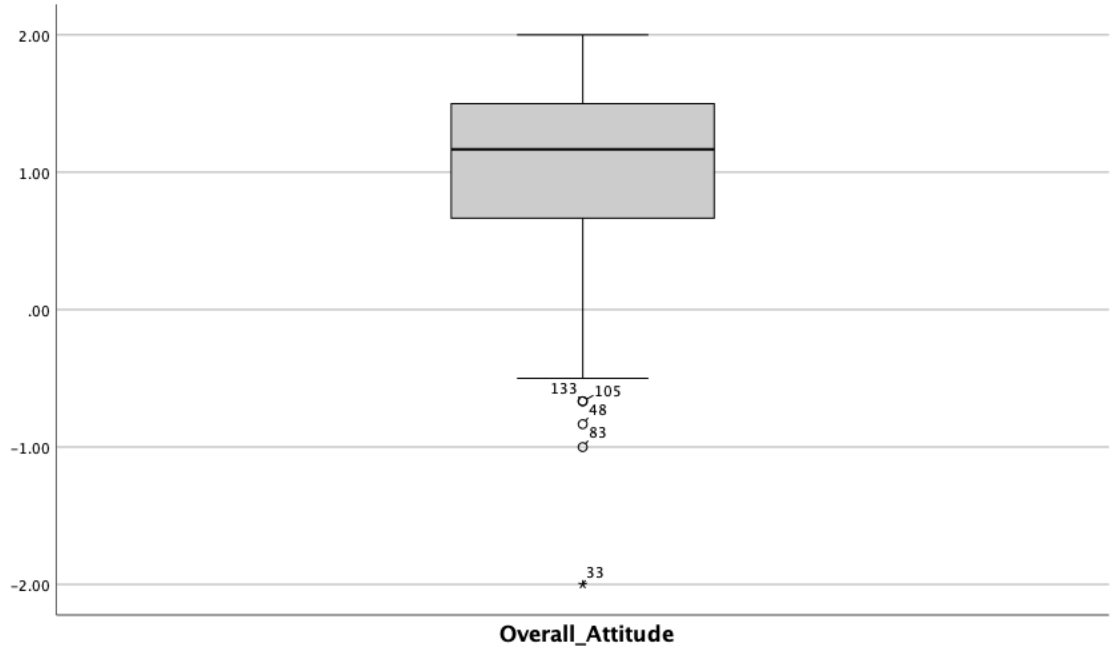
Frequency Distribution of Overall Attitude Across the Sample



Note. The distribution is slightly skewed to the right and depicts one main outlier to the very left. This involves a case with a minimum average rating of -2 on the importance of reading study information.

Figure 4

Boxplot of Overall Attitude Across the Sample



Note. The five circles marked by case number present outliers that lie outside the ranges of (third quartile + 1.5 * interquartile range) and (first quartile – 1.5 * interquartile range). There is one extreme outlier marked with an asterisk that lies outside the ranges of (third quartile + 3 * interquartile range) and (first quartile – 3 * interquartile range).

Appendix C

Assumption Checks for Hypothesis 1

Figure 5

Normal Q-Q Plot of Overall Attitude in the New Sample

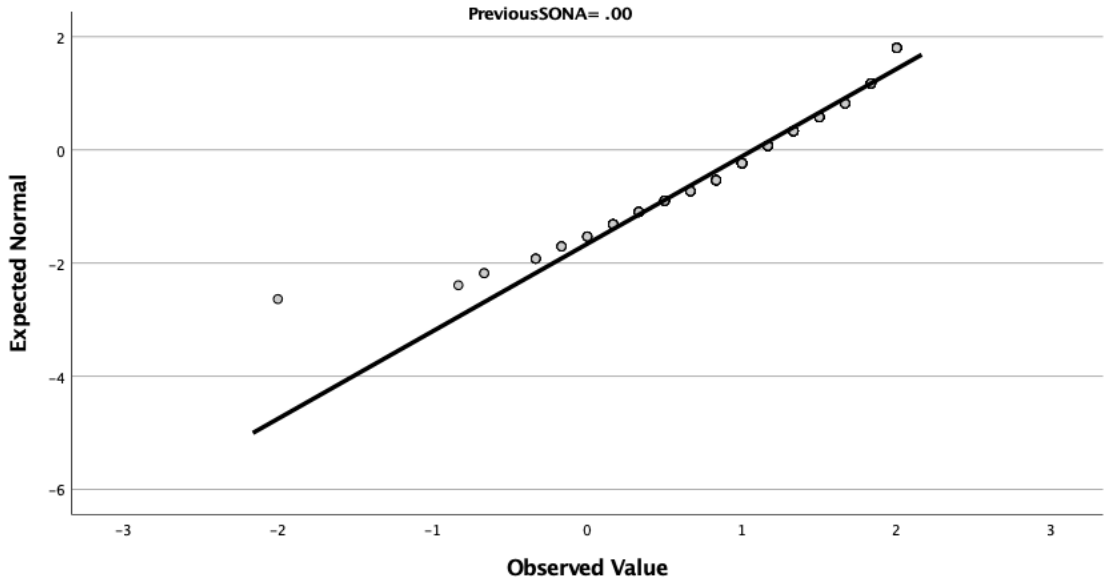


Figure 6

Normal Q-Q Plot of Overall Attitude in the Old Sample

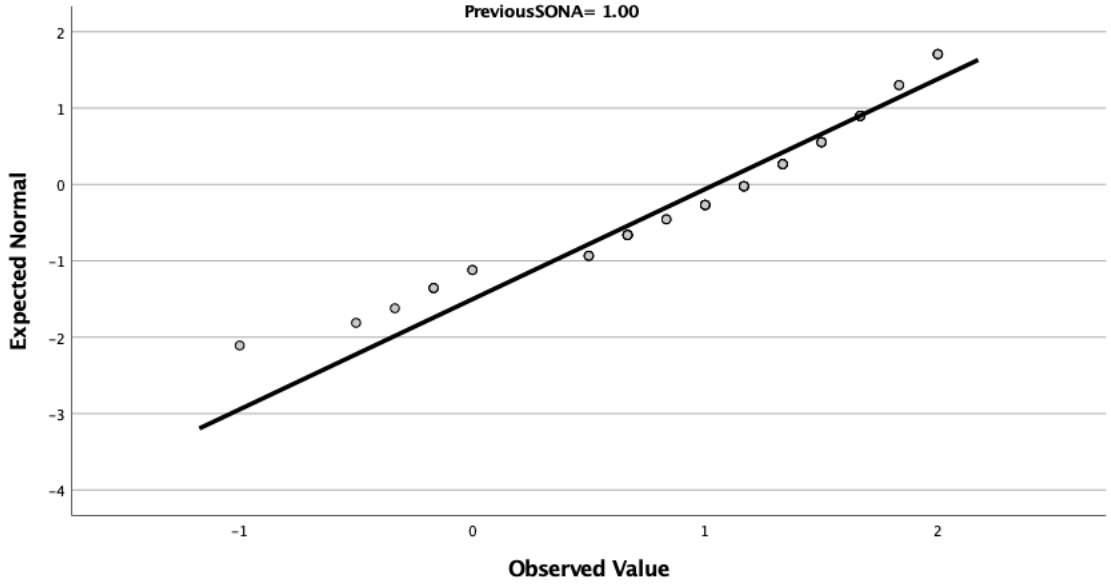
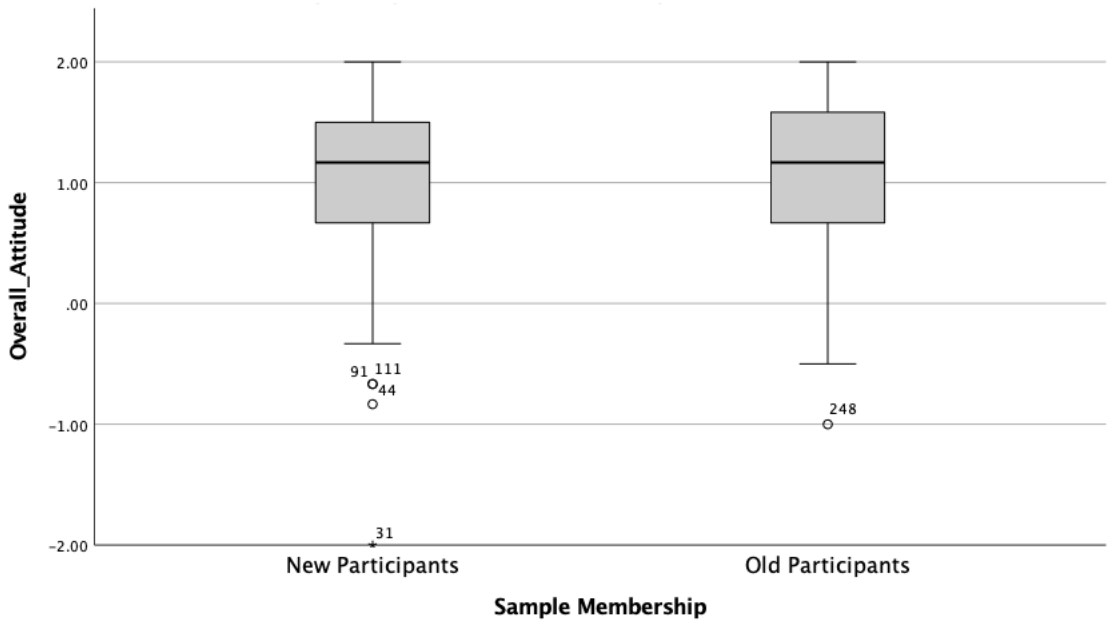


Figure 7

Simple Boxplot of Overall Attitude By Sample Membership



Appendix D

Assumption Checks for Hypothesis 2

Figure 8

Normal Q-Q Plot of Overall Attitude in the New Sample

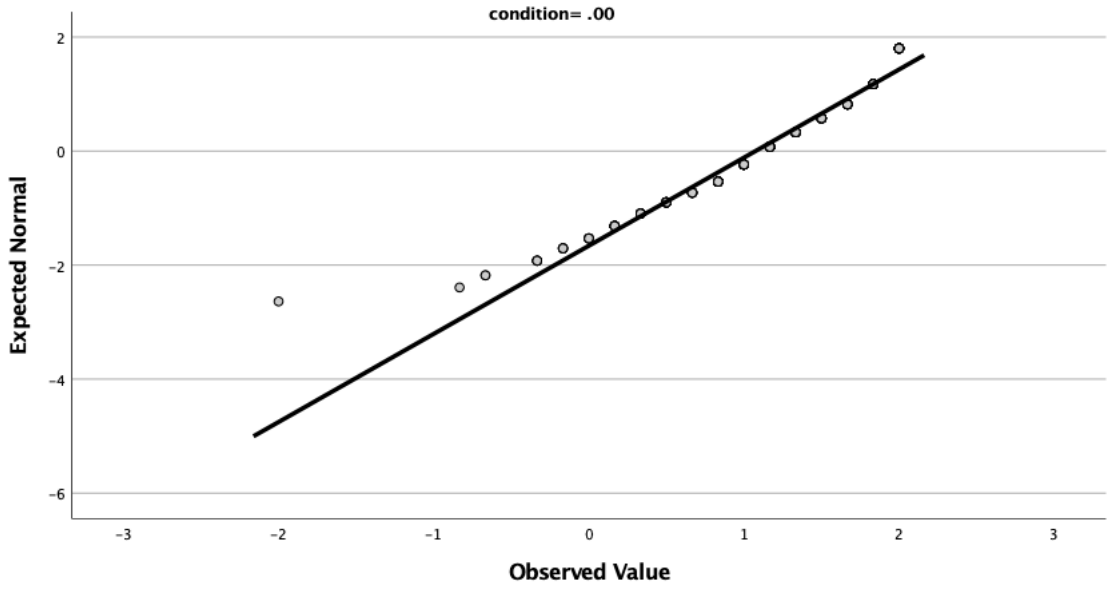


Figure 9

Normal Q-Q Plot of Overall Attitude in the Non-Interactive Sample

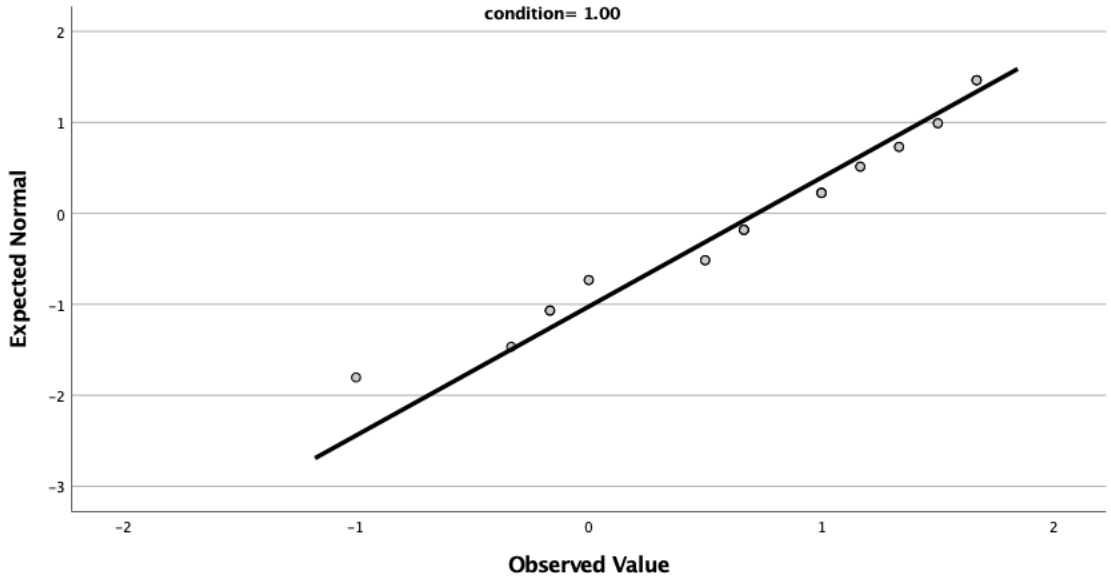


Figure 10

Normal Q-Q Plot of Overall Attitude in the Interactive Sample

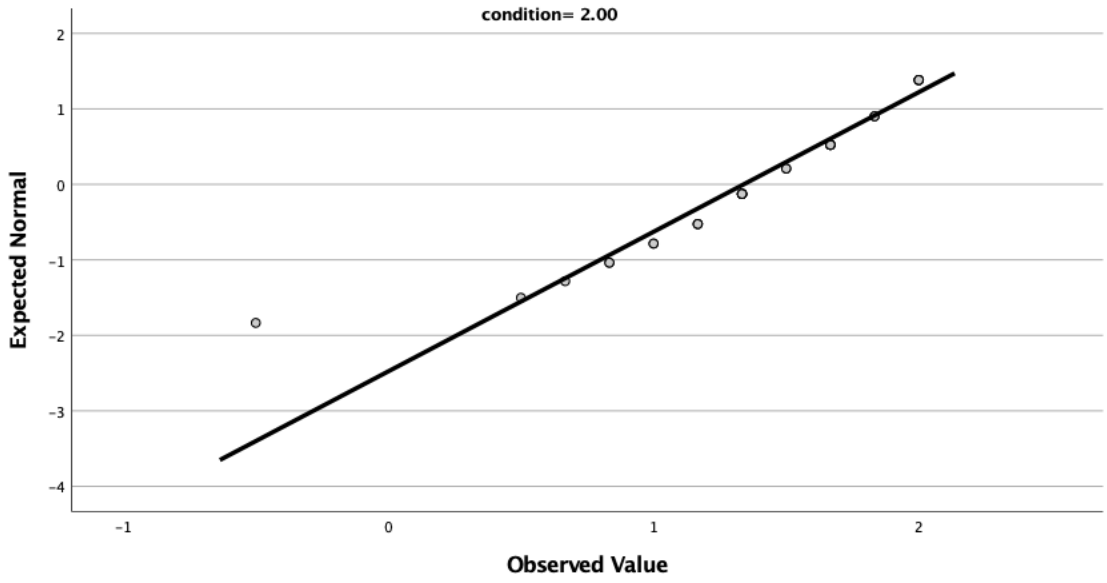
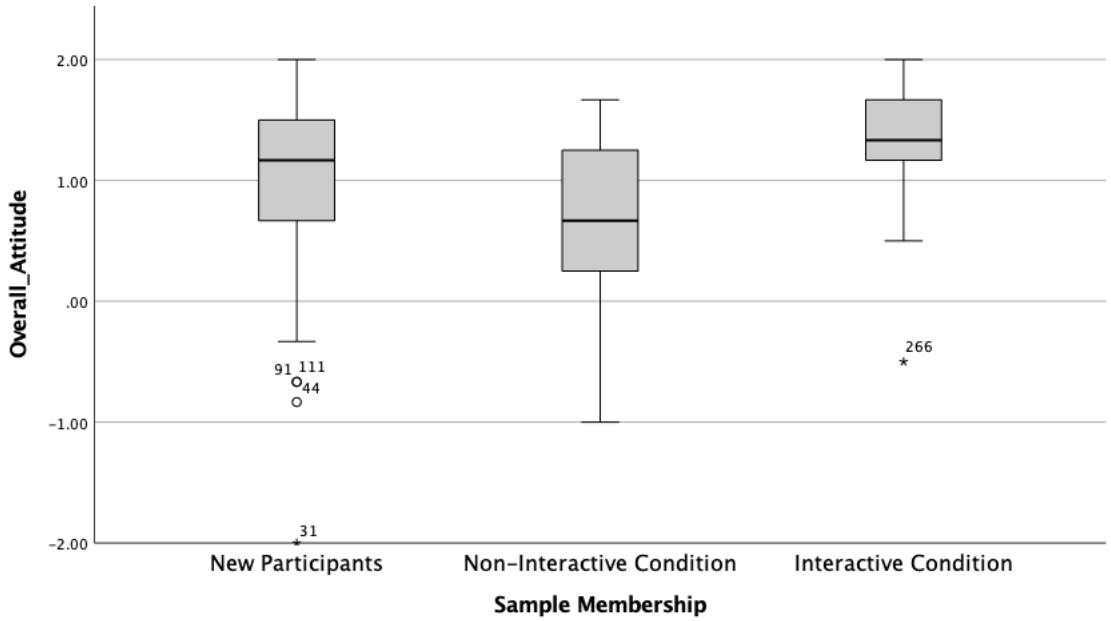


Figure 11

Simple Boxplot of Overall Attitude By Sample Membership



Appendix E

Assumption Checks for Hypothesis 3

Figure 12

Normal P-P Plot of Regression Standardized Residuals of Neuroticism

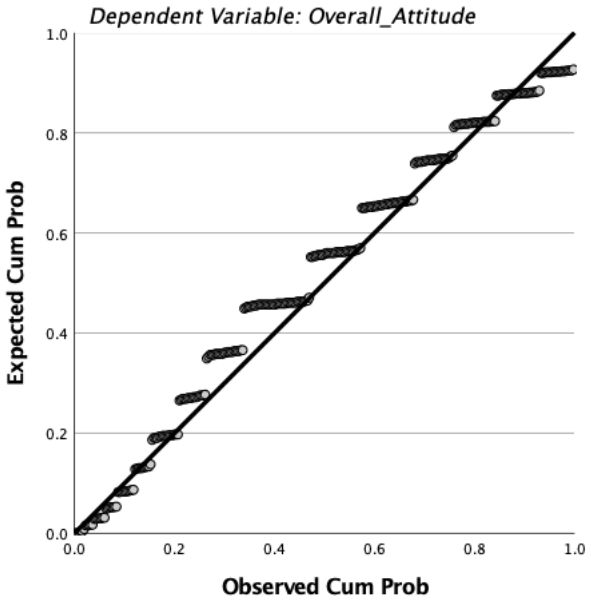


Figure 13

Scatterplot of the Standardized Residuals of Neuroticism

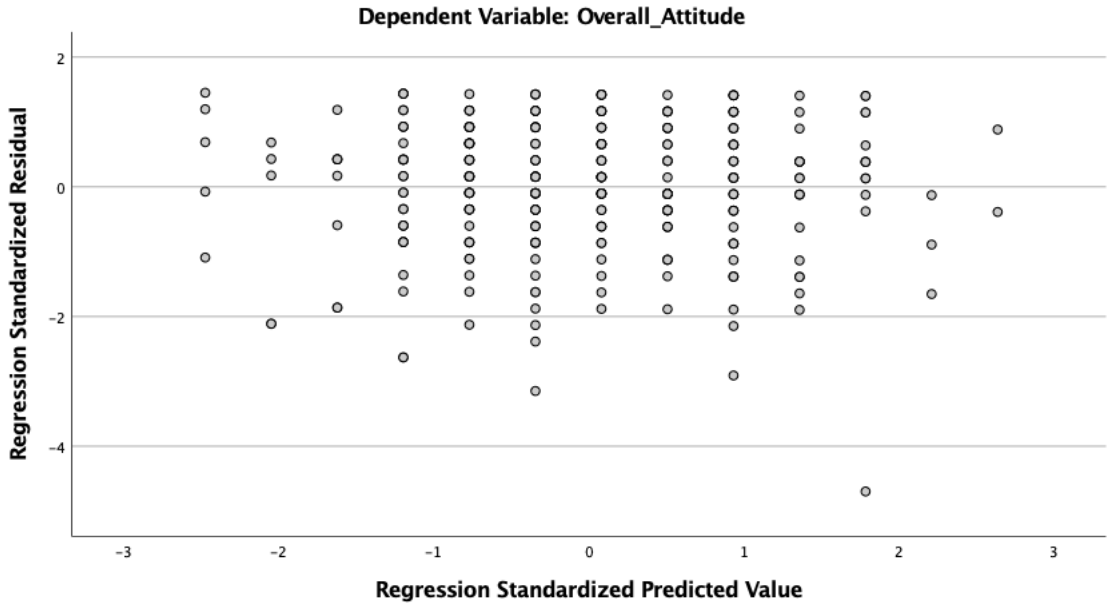
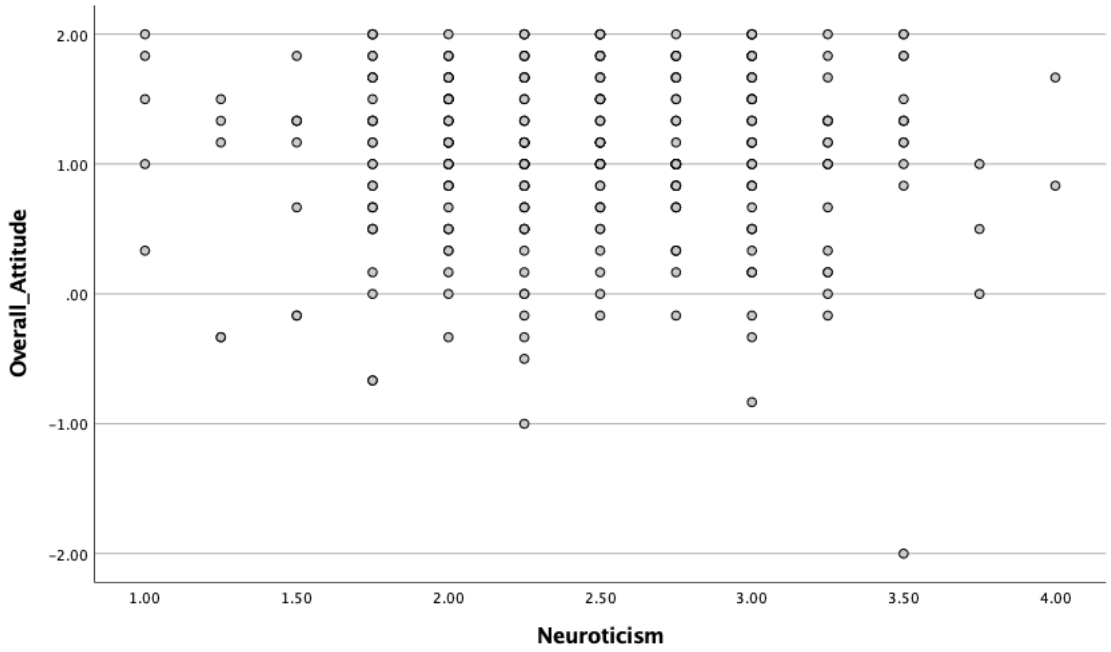


Figure 14

Scatterplot of Overall Attitude on Neuroticism



Appendix F

Assumption Checks for Hypothesis 4

Figure 15

Normal P-P Plot of Regression Standardized Residuals of Conscientiousness

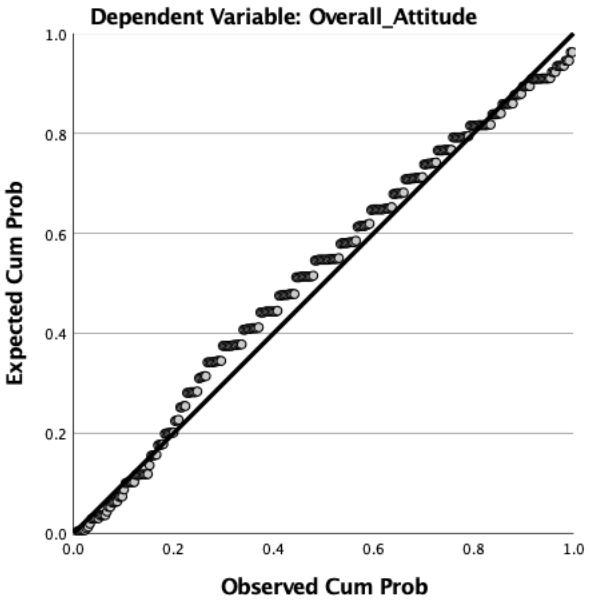


Figure 16

Scatterplot of the Standardized Residuals of Conscientiousness

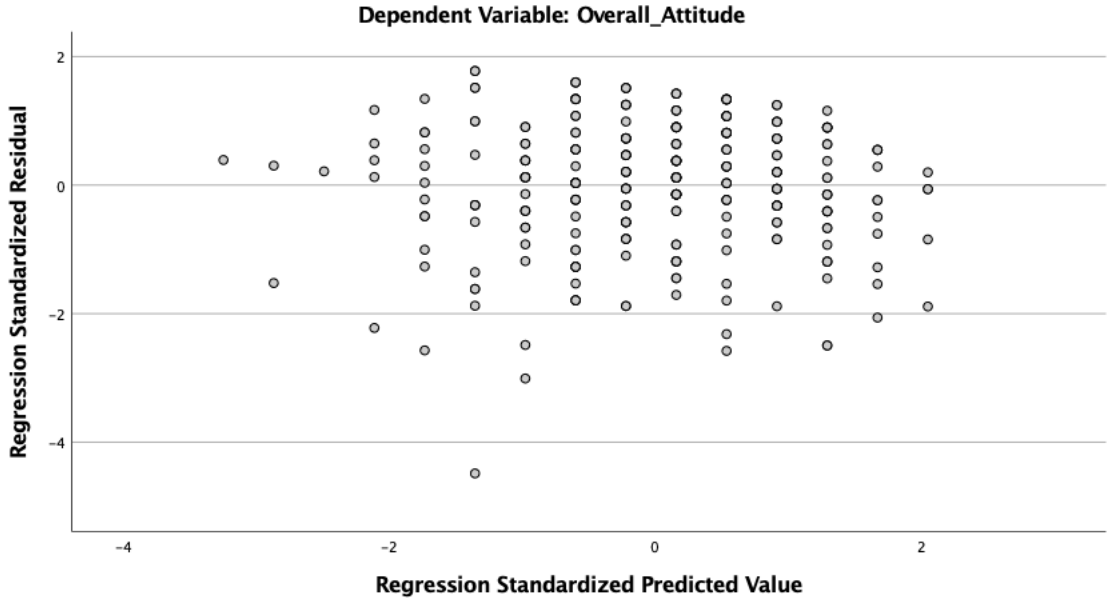
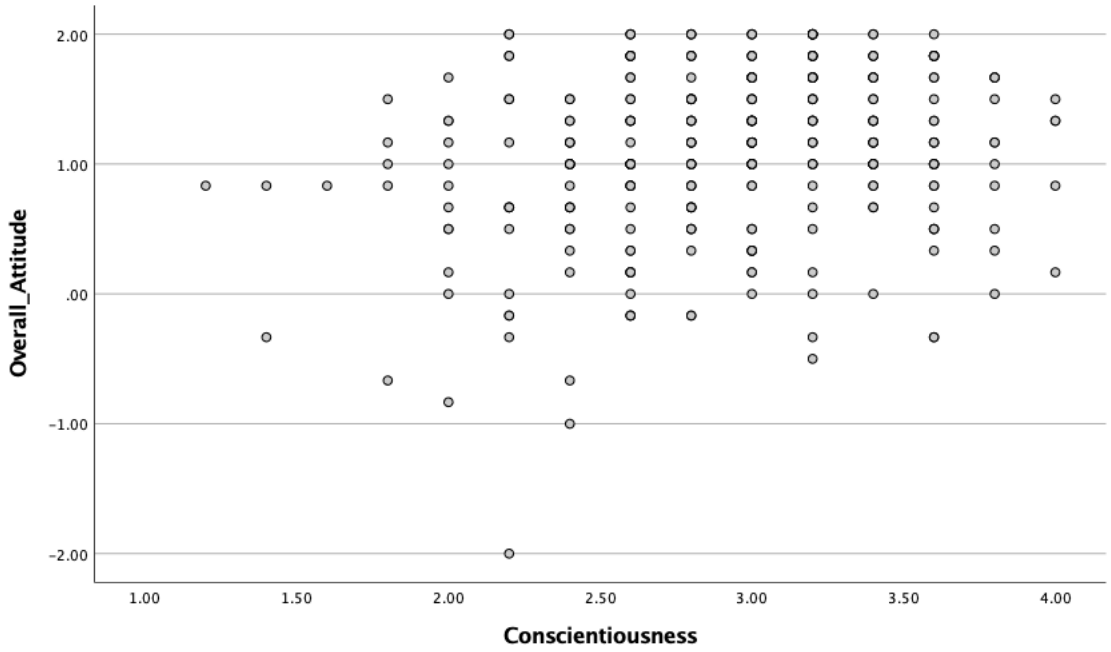


Figure 17

Scatterplot of Overall Attitude on Conscientiousness



Appendix G

Assumption Checks for Hypothesis 5

Figure 18

Normal P-P Plot of Regression Standardized Residuals of Number of Past SONA studies

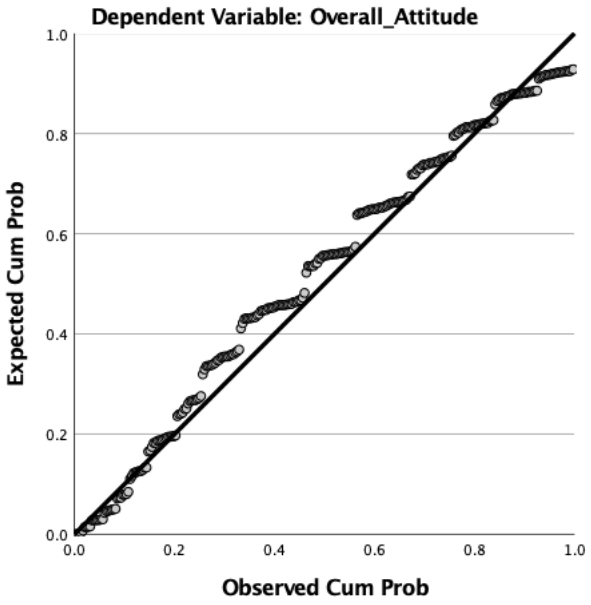


Figure 19

Scatterplot of the Standardized Residuals of Number of Past SONA studies

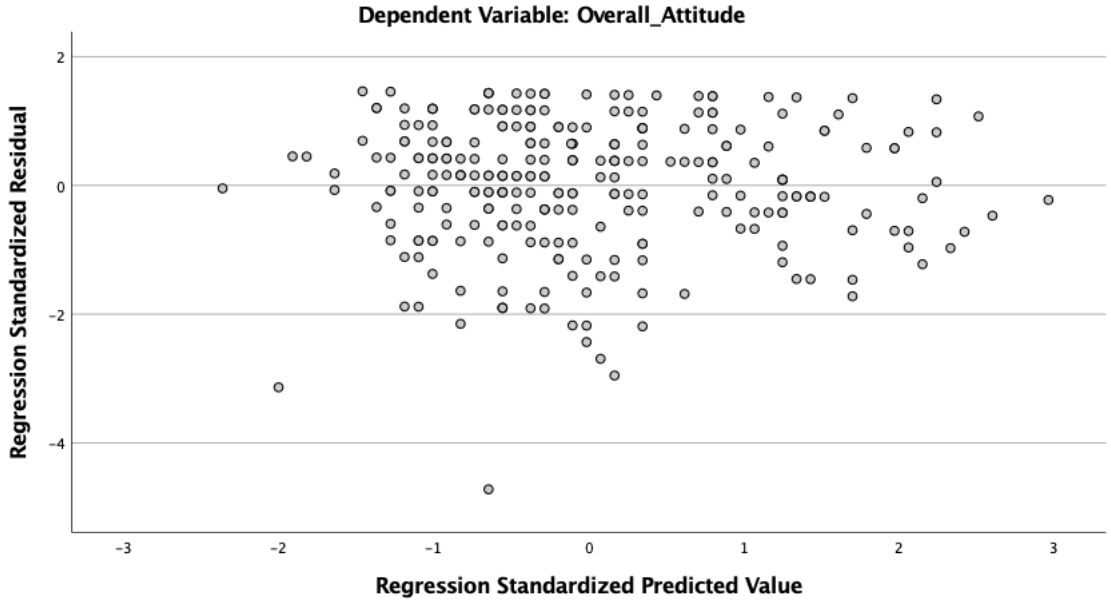


Figure 20

Scatterplot of Overall Attitude on Number of Past SONA studies