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RELATION OF CONSCIENTIOUSNESS, HOSTILITY, AND NEGATIVE AFFECT TO BLOOD PRESSURE MEASURED IN AN UNRESTRICTED AND IN A RESTRICTED CONDITION: SUPPLEMENTAL ANALYSES OF DATA GENERATED FROM HYPERTENSION OPTIMAL TREATMENT (HOT STUDY).

Samantha Vazquez

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FROM HYPERTENSION OPTIMAL TREATMENT (HOT STUDY).

A thesis submitted in partial fulfillment
of the requirements for the degree of

MASTER OF ARTS

to the faculty of the

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of

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at

ST. JOHN'S UNIVERSITY

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Date Submitted _____

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ABSTRACT

RELATION OF CONSCIENTIOUSNESS, HOSTILITY, AND NEGATIVE AFFECT TO BLOOD PRESSURE MEASURED IN AN UNRESTRICTED AND IN A RESTRICTED CONDITION: SUPPLEMENTAL ANALYSES OF DATA GENERATED FROM HYPERTENSION OPTIMAL TREATMENT (HOT STUDY).

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The relationship between personality and blood pressure (BP) was examined under two conditions. Six hundred and sixty-six participants were selected from the original HOT study data set and asked to complete the Big Five Inventory, Cook Medley Hostility Scale, and the Positive and Negative Affect Scale. The two conditions were enrollment blood pressure, when the treatment of BP was unrestricted and qualifying blood pressure, when treatment of BP was restricted. Results revealed that conscientiousness had a strong relation to blood pressure in both conditions but had a stronger relation to blood pressure in the unrestricted condition. Hostility and negative affect showed a strong relation to blood pressure for both enrollment and qualifying blood pressure but had a stronger relation to blood pressure in the restricted condition. The relation of Conscientiousness to blood pressure was also mediated by participants' antihypertension medication status. The results suggest that Conscientiousness operates on blood pressure through constructive behavior (medication adherence), whereas Hostility and Negative Affect may operate as maladaptive emotions that exacerbate the causes of BP.

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INTRODUCTION

The relation of personality to health behaviors and outcomes has been widely studied. Hypertension in particular, is a foundational cause of stress on both the mind and on the body. Increased blood pressure creates a greater chance for cardiovascular diseases, coronary heart disease, stroke, and death. A great potential exists for improving health and increased longevity through control of elevated blood pressure (Stamler, Stamler and Neaton, 1993). Although an insufficient reduction of blood pressure is the source of the problem, the optimal target blood to achieve is uncertain. The HOT study was designed to determine the optimal target blood pressure. Using a small subset of data from the HOT study, the current study is designed to test the hypotheses about the relation of personality to blood pressure in two conditions

The Hypertension Optimal Treatment (HOT) was a trial study evaluating about 19,000 patients to determine what the optimal target blood pressure was for treatment of hypertensive individuals. This included treating individuals through low dose aspirin therapy to see a reduced rate in morbidity. Antihypertensive treatment on average reduced the diastolic blood pressure below 90 mmHg, which was in turn associated with a reduction of cardiovascular events (Mancia, Omboni, Parati, Clement, Haley, Rahman and Hoogma, 2001).

Many psychosocial factors such as psychological states and traits are related to hypertension. The strongest support for psychosocial factors as predictors of hypertension development are anger, anxiety and depression. (Rutledge and Hogan, 2002). There have also been relationships found between hypertension and the big five personality traits.

Patients with various personality traits are associated with adherence to treatments,

specifically traits related to conscientiousness in the big five factor model of personality (Sanz, Garcia-Vera, Espinosa, Fortun, and Magan, 2010). Higher levels of conscientiousness predicted lower blood pressure, and high neuroticism predicted higher blood pressure (Turiano et al., 2012). Conscientiousness acts as a protective factor because of the way that highly conscientious people pay attention to medical advice, postpone their gratification and have planful and orderly lives (Cheng, Montgomery, Treglown, and Furnham, 2017). Hypertensive individuals also scored higher on neuroticism, trait and state anxiety and Type A behavior (Irvine, Garner, Olmsted, and Logan, 1989). These personality traits can contribute as risk factors for individuals with high blood pressure.

Hostility is another personality trait that has strong links to hypertension. It has been suggested by Baer, Collins, Bourianoff and Ketchel (1979) that hypertensive people reported higher levels of hostility and anxiety than normotensives. Hostility encompasses feelings associated with both anger and threatening displays. Hypertensive individuals also scored higher on state anger, and anger suppression (Irvine, Garner, Olmsted, and Logan, 1989). Hostility is an emotion that is clearly connected with high blood pressure.

There is also a relationship between hostility and stress. High hostility individuals displayed greater diastolic blood pressure reactivity during interpersonal conflict and reported less social support and more negative life events and daily irritants than did low hostility individuals (Hardy and Smith, 1988). Having such high amounts of stress and hostility can negatively impact an individual's physical and mental health. It was also found that hostility is related to disease by way of excessive physiological reactivity and a generally stressful, unsupportive social network (Hardy and Smith, 1988).

Negative affect measured in daily life was significantly higher during moments when participants reported current stressors, than in moments with no stressors (McIntyre et al., 2019). Stress and the way an individual can respond to it can certainly cause physiological and cognitive hindrance, especially with the involvement of negative emotions. Chronic anger and negative reactions to stress can increase health risks (McIntyre et al., 2019). Depending on the type of negative affect, daily stressors can be associated with these negative emotions which have the possibility of causing negative health outcomes.

Positive affect includes experiences with positive emotions such as cheerfulness and enthusiasm. Not much literature has been investigated on the subject of positive affect and hypertension but links between the two have been asserted. According to Ostir, Berges, Markides and Ottenbacher (2006), positive emotions are related to lower blood pressure and are suggestive of a protective role against cardiovascular related diseases. They also found that an individual's level of emotional wellbeing and blood pressure can help to reduce blood pressure through psychological means.

Negative affect involves emotions relating to poor self-concept and negative emotionality, which is a risk factor for hypertensive individuals. Increased negative affect was associated with elevated risk for self-reported and incident hypertension (Jonas and Lando, 2000). Negative affect can reveal itself as depression, anxiety or even sadness. According to Kretchy, Owusu-Daaku and Danquah (2014), hypertensive patients experienced symptoms of anxiety, depression and stress in relation to anti-hypertensive medication adherence.

A reduction in hypertension is not only impacted by medication therapy but by individual differences as well. Individuals with hypertension are affected by patient specific factors, beliefs about health, antihypertensive medications, and health care services related factors that relate to their ability to control their own hypertension (Ogedegbe et al., 2004).

The primary goal of this research is to assess the relation between individual difference variables and blood pressure differences under the two conditions. In one condition called unrestricted, the participants were allowed to manage their blood pressure by either taking their medication or not. In the other condition called restricted, the participants were specifically told to stop taking any medication. The big five personality traits, hostility, and negative affect were measured using self-report questionnaires. The independent variables included the big five personality traits, hostility and negative affect whereas the dependent variable was blood pressure differences between the two conditions. The primary hypothesis is that conscientiousness, hostility and negative affect will be differentially related to blood pressure in the two conditions, higher conscientiousness will predict lower blood pressure in the unrestricted condition. Negative affect and hostility will predict higher blood pressure in the restricted condition compared to the unrestricted condition. Secondly, we hypothesized that the conscientiousness effects will be mediated by whether participants were taking antihypertensive medications in the unrestricted condition.

METHODS

Participants

Participants were 666 individuals taken from the original 18,790 patients who were recruited to participate in the Hypertension Optimal Treatment (HOT) study. Participants from the HOT study were gathered from 26 countries. There were no exclusions in terms of gender, or race. Participants must have been diagnosed with hypertension. In our study there was an additional exclusion criterion that participants had to be a native English speaker. Table 1 shows the descriptive statistics for the complete HOT study participants and the characteristics of our subsample of 666.

Measures

Big Five. The Big Five was measured using the Big Five Inventory (BFI-54), which is a self-report questionnaire that measures an individual on the Big Five factors of personality. Big Five personality factors such as extraversion, agreeableness, conscientiousness, neuroticism and openness were separated into personality facets. There were 54 items with responses including “1” disagree strongly to “5” agree strongly. Questions from this inventory included “is reserved”, “likes to cooperate with others”, and “generates a lot of enthusiasm”. When applied items were averaged to obtain scores based on the 5 scales. The internal consistency for reliability ranged from 0.77 to 0.81.

Positive and Negative Affect. Both positive and negative affect were measured using the Positive and Negative Affect Schedule (PANAS), which is a self-report questionnaire that measures positive and negative affect. There are two scales with 10

questions each including responses such as “1” very slight or not at all to “5” extremely. Questions from this scale included the extent to which you felt “scared”, “attentive” or “excited” over the past week. Items were averaged to create a total score with a higher score representing higher levels of positive affect and lower scores representing lower levels of negative affect. The internal consistency found for alpha was 0.88 for items in the positive affect portion and 0.87 for items in the negative affect portion.

Hostility. Hostility was measured using the Cook-Medley Hostility Scale (Ho), which is a self-report questionnaire that measures individual feelings about hostility with regards to their beliefs and behaviors towards others. Subsets such as cynicism, hostile attributions, hostile affect, aggressive responding, social avoidance and other were identified. The scale consists of 50 questions with responses being “true” or “false”. Questions from this scale included “I am likely to not speak to people until they speak to me” and “People often disappoint me”. There was no time frame used in terms of how long you have felt these beliefs and behaviors. Items were averaged to create a total score with higher scores indicating higher levels of trait hostility, which can contribute to adverse health outcomes. The internal consistency for reliability was 0.84.

Two measures of blood pressure in the initial enrollment and qualifying conditions are the focus. In the enrollment condition, participants came in to participate in the trial while their blood pressure was obtained under usual or unrestricted conditions. In the qualifying condition, participants subsequently before the start of the trial were taken off their medications and as a result their blood pressure was obtained in a more standardized or controlled way where no one was on medication. The focus of the HOT

study was diastolic blood pressure, but we are looking at both systolic blood pressure and diastolic blood pressure in the present study.

Procedures

The Hypertension Optimal Treatment (HOT) study recruited 18,790 participants with a diagnosis of hypertension (Hansson, 1999). After enrollment participants were taken off their antihypertensive medications. To qualify participants diastolic blood pressure had to be at the diagnostic level (90 mmHg) once they were taken off their medication. Participants were randomly assigned to 3 target levels to ensure that there was a range of diastolic blood pressure achieved so that the optimal level of diastolic blood pressure lowering could be determined. Participants were followed for about 3.8 years. Participants blood pressure was assessed at enrollment and qualifying conditions. The goal of the study was to lower the diastolic blood pressure of the participants with hypertension at three diastolic blood pressure target levels. Initially aspirin was prescribed for treatment, but other antihypertensive medications were used to reach target levels. At enrollment, 52% of patients were receiving antihypertensive treatment in the HOT sample (Hansson, and Zanchetti, 1994).

Within our study, 666 participants from the HOT study were assessed on personality measures from Big Five personality traits, positive and negative affect and hostility. Personality measures were only assessed once at the beginning of the trial.

ANALYSES

The primary analysis compared the initial blood pressure measures obtained at enrollment (unrestricted), and qualifying (restricted), to evaluate the impact of individual differences on enrollment blood pressure, which is blood pressure obtained when patients may have been taking antihypertensive medications and qualifying blood pressure when patients were taken off their antihypertensive medications.

RESULTS

Descriptive Statistics

Descriptive statistics were gathered for both the HOT sample and the personality subsample. The mean age of participants for the HOT sample was 61.5 with a standard deviation of 7.5 and for the personality subsample was 61.2 with a standard deviation of 6.9. There were not many differences as our personality subsample was relatively equivalent to the HOT sample. This can be seen in Table 1.

Primary Analyses

A mixed effects regression analysis was used to assess the relation between individual difference variables and blood pressure difference within the two conditions. Findings for conscientiousness, negative affect and hostility are reported for both systolic (Table 2) and diastolic blood pressure (Table 3). Exploratory analyses of the remaining personality scales are also shown in the tables. Higher scores on conscientiousness, were generally associated with lower systolic blood pressure at enrollment with a predicted mean of 156.7 and at qualifying with a predictive mean of 166.8. This is shown in Figure 3. Higher scores on negative affect were related to higher systolic blood pressure at enrollment with a predicted mean of 156.8 and at qualifying with a predictive mean of 166.6. This can be seen in Figure 6. Higher scores on hostility expressed higher systolic blood pressure at enrollment with a predicted mean of 156.8 and at qualifying with a predictive mean of 168.6. This can be seen in Figure 9.

Similar findings for conscientiousness, hostility and negative affect were also found for diastolic blood pressure. However, the effect sizes were smaller and not all

reached conventional levels of statistical significance. Higher scores on conscientiousness were related to lower diastolic blood pressure at enrollment with a predicted mean of 96.8 and at qualifying with a predicted mean of 104.8. This can be seen in Figure 11. Higher scores on higher negative affect predicted higher diastolic blood pressure at enrollment with a predicted mean of 97 and at qualifying with a predicted mean of 104.8. This can be seen in Figure 14. Higher scores on hostility were related to higher diastolic blood pressure at enrollment with a predicted mean of 97 and at qualifying with a predictive mean of 105. This can be seen in Figure 17.

Mediation Analyses

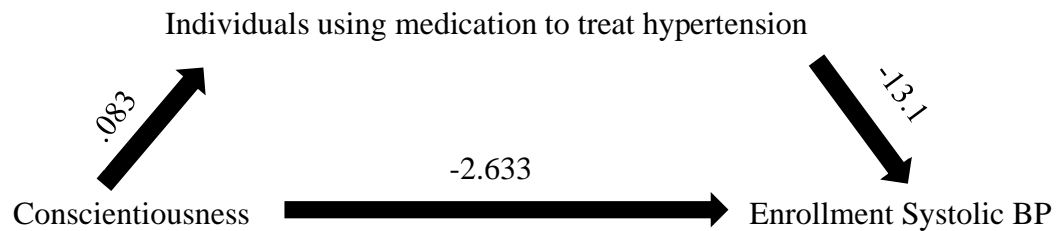


Figure 1. Moderating effect of medication on the relation between conscientiousness on enrollment and qualifying blood pressure differences.

Enrollment systolic blood pressure at the mean for conscientiousness was 156.7 whereas at 1 point above the mean, blood pressure was 3.7 mmHg lower. Qualifying systolic blood pressure at the mean for conscientiousness was 166 whereas at 1 point above the mean, blood pressure was 2.6 mmHg lower. The effect of conscientiousness for systolic blood pressure is most strongly related to enrollment blood pressure and is less for qualifying blood pressure. Only in enrollment blood pressure is conscientiousness mediated by medication adherence.

Enrollment systolic blood pressure at the mean for hostility was 156.8 whereas at 1 point above the mean, blood pressure was 14.8 higher. Since individuals are higher in enrollment blood pressure, medication adherence is not mediated for hostility but related to it. Qualifying blood pressure was unrelated to hostility, with a blood pressure that was 1.6 mmHg higher.

Enrollment systolic blood pressure at the mean for negative affect was 156.8 whereas at 1 point above the mean, blood pressure was 2.1 mmHg higher. Negative affect is not as strongly related to enrollment blood pressure and is not related to medication adherence as a mediator. Both conscientiousness and hostility in relation to enrollment blood pressure is mediated by medication adherence but neither is related to qualifying blood pressure.

Our hypothesis was that the reason conscientiousness is related to blood pressure differences is because in enrollment condition, conscientious people are more likely to be taking medication. This means that people with low blood pressure in conscientiousness will be stronger in enrollment than in qualifying condition. To test this hypothesis, we established that conscientiousness is related to medication adherence. We tested this using logistic regression analyses to determine if conscientiousness was related to medication adherence and we reported odd ratio, B and P values. To describe the results, we used linear probability model to give appropriate path coefficients within the mediation model.

DISCUSSION

The primary purpose of this study was to test the hypothesis or impact of personality on a person's blood pressure that was measured under two conditions. One condition was called enrollment or also referred to as an unrestricted condition over how the individual managed their own blood pressure. The other condition was the restricted condition, also called qualifying where individuals were taken off any of their antihypertensive medications. The primary hypothesis stated that conscientiousness, hostility and negative affect will moderate blood pressure difference specifically, higher conscientiousness will be lower in blood pressure in the unrestricted condition. Negative affect and hostility predicted a higher blood pressure in the restricted condition. In general, we found partial support for this hypothesis, specifically the relationship between these personality differences.

With these personality variables, conscientiousness demonstrated a strong relation to blood pressure in both enrollment and qualifying blood pressures but had stronger relations of blood pressure in enrollment blood pressure. Individuals with a higher level of conscientiousness had lower blood pressure. This has been positively associated with medication adherence. Individuals not taking their medication had a mean of 166, while at 1 point above the mean lowering by 2.6 mmHg and while taking medication was lowered by 13.1 mmHg. This suggests that premeds are related to conscientiousness. Conscientiousness predicts adherence to medical regimens, such as adherence to anti-hypertensive medication, cholesterol lowering treatment, and post-transplant medication adherence (Terracciano et al., 2014).

Our findings suggested that hostility showed a strong relation to blood pressure for both enrollment and qualifying blood pressure but had an even stronger relation in restricted blood pressure. Individuals with a higher level of hostility had higher blood pressure. Hostility may increase the risk that hostile people tend to smoke, drink and eat more. This not only acts as a risk factor for hostility, but also for developing a long-term risk of hypertension. Hostility doesn't just impact an individual's lifestyle, but their physical health as well. Hostility is associated with cardiovascular morbidity and mortality, and all-cause mortality as well (Räikkönen, Matthews, Flory, and Owens, 1999).

Negative affect also showed a strong relation to blood pressure in both enrollment and qualifying blood pressure but had a stronger relation in qualifying blood pressure. Individuals with a higher level of negative affectivity had higher blood pressure. Negative emotions have been linked to increases in blood pressure (Ostir, Berges, Markides, and Ottenbacher, 2006). Anxiety and depression are predictive of later incidence of hypertension and prescription treatment for hypertension (Jonas, 1997). Both of these negative emotions have also revealed a relationship to hypertension that results directly in acute autonomic arousal and blood pressure reactivity.

While our main goal of the study was to determine the relationship between individual differences variables and blood pressure difference under two conditions, several implications were sought out from our findings. One implication focused on whether personality impacts variables and when it does not. This can be further questioned with our situational variables including enrollment blood pressure and qualifying blood pressure. Does personality moderate how these situational variables

operate? In our findings we asserted that the personality variables would have a stronger relationship to enrollment blood pressure than to qualifying blood pressure. This would suggest that the stronger relationship to enrollment blood pressure was due to medication adherence as the central mediator to personality.

Another issue that stems from the main findings questions if this research has implications for the treatment of blood pressure. Would it be appropriate to treat individuals under an aggressive form of treatment in order to lower their blood pressure? It is important to note if this suggests a difference in blood pressure interventions. In our findings, participants blood pressure was assessed while they were currently taking medication at enrollment and at qualifying, where they were taken off their antihypertensive medications. While the current intervention produced the lowest incidence of major cardiovascular events and the lowest risk of cardiovascular mortality, it also led to seven fatal episodes of bleeding in the aspirin group and eight fatal episodes in the placebo group (Hansson, 1999). Many of the cardiovascular events demonstrated a decline in frequency to the optimal blood pressure, but effects also gradually declined to the point of death.

This study has potential limitations including the sample size. Only 666 participants were available to take the personality measures given when there was a total of 18,790 participants in the HOT study. With regards to the demographic of participants, there was no information gathered about a history of alcohol or substance abuse. The positive relationship between the amount of alcohol consumed and blood pressure is one of the strongest associations of potentially modifiable risk factors for hypertension (Friedman, Klatsky and Siegelau, 1982). Demographic questions only asked if

participants were smokers or non-smokers. Data could not be assessed past the 36-month mark as at the 42-month assessment 327 of 666 participants has missing data and at the 48-month assessment, 592 out of 666 participants had missing data.

Future directions for this research include the use of different personality measures. While the BFI-54, PANAS, and Cook Medley Hostility Scale had adequate reliability and validity, it would be interesting to see other personality measures incorporated into the study and whether they would change the primary findings at all. A measure of stress should also be included in this research. Whether it be through physiological or self-report measures, assessing stress in these participants could help in determining a mediator for hostility and negative affect. In conclusion, future research efforts are needed to determine appropriate interventions for hypertensive treatment in relation to personality variables and establish how mediators can moderate the effects between personality and blood pressure differences within the two conditions.

Table 1.

Descriptive statistics for the HOT sample and personality sub sample.

Subset	HOT (N=18,790)	Subset (N=666)	HOT vs Subset Difference of p value
Age	61.5 (7.5)	61.2 (6.9)	p =
.233			
Sex			
Women	47%	37.4%	p <
.001			
Men	53%	60.2%	p <
.001			
Race			
Caucasian	???	593	
Black	???	46	
Asian	???	3	
Other	???	24	
Medication			
Pre-medication	??	492	
No medication	??	174	
Smoker	15.9%	14.1%	p =
.186			
Non-smoker	84.1%	85.9%	
BMI	28.4 (4.7)	30.6 (5.8)	p <
.001			
Edbp	105 (3.4)	96.8 (10.4)	p <
.001			
Esbp	170 (14.4)	156.9 (19.0)	p <
.001			
MI	1.6%	2.1%	

Other CHD	5.9%	4.1%
Diabetes	8.4%	8.4%
Stroke	1.2%	0.9%

Note. Missing data not found in the HOT Study was represented by question marks. CHD = congenital heart disease. MI = myocardial infarction. Edbp = enrollment diastolic blood pressure. Esbp = enrollment systolic blood pressure.

Table 2.

Individual differences on personality for systolic blood pressure on enrollment and qualifying conditions.

SBP	Est	t	p	95% CI Lower Bound	95% CI Upper Bound
Hostility	14.8	3.49	0.001	6.47	23.2
Intercept	156.8	212.6	0.000	155.3	158.2
EQ	10.1	15.6	0.000	8.8	11.3
EQ x Hostility	-13.1	-3.52	<.001	-20.5	-5.81
Positive Affect	-2.15	-1.66	0.098	-4.69	0.394
Intercept	156.8	211.3	0.000	155.4	158.3
EQ	9.8	14.8	0.000	8.53	11.1
EQ x Positive Affect	1.07	0.921	0.357	-1.21	3.35
Negative Affect	2.1	1.9	0.058	-0.075	4.28
Intercept	156.8	211.4	0.000	155.4	158.3
EQ	9.8	14.9	0.000	8.54	11.2
EQ x Negative Affect	-2.39	-2.41	0.016	-4.34	-0.44
Openness	-3.7	-2.72	0.007	-6.36	-1.03
Intercept	156.7	208.1	0.000	155.2	158.2
EQ	10.1	15.0	0.000	8.77	11.4
EQ x Openness	1.33	1.09	0.275	-1.06	3.71
Neuroticism	1.66	1.87	0.062	-0.081	3.41
Intercept	156.7	207.4	0.000	155.2	158.2
EQ	10.1	15.0	0.000	8.77	11.4
EQ x Neuroticism	-1.21	-1.53	0.127	-2.76	0.345
Conscientiousness	-3.72	-2.85	0.005	-6.29	-1.15
Intercept	156.7	208.2	0.000	155.2	158.2
EQ	10.1	15.0	0.000	8.77	11.4
EQ x Conscientiousness	2.37	2.03	0.043	0.077	4.66
Agreeableness	-1.06	-0.831	0.406	-3.57	1.45
Intercept	156.7	207.0	0.000	155.2	158.2
EQ	10.1	15.0	0.000	8.77	11.4
EQ x Agreeableness	1.78	1.57	0.118	-0.45	4.01

Extraversion	-2.52	-2.18	0.03	-4.79	-0.248
Intercept	156.7	207.7	0.000	155.2	158.2
EQ	10.1	15.0	0.000	8.77	11.4
EQ x Extraversion	1.15	1.12	0.265	-0.874	3.18

Note. CI = confidence interval.

Table 3.

Individual differences on personality for diastolic blood pressure on enrollment and qualifying conditions.

DBP	Est	t	p	95% CI Lower Bound	95% CI Upper Bound
Hostility	7.62	3.28	0.001	3.05	-12.19
Intercept	96.8	240.0	0.000	96.0	97.6
EQ	8.0	20.9	0.000	7.21	8.71
EQ x Hostility	-6.61	-3.01	0.003	-10.92	-2.3
Positive Affect	-0.2	-0.28	0.778	-1.61	1.21
Intercept	97.0	235.2	0.000	96.2	97.8
EQ	7.80	20.0	0.000	7.04	8.57
EQ x Positive Affect	0.08	0.12	0.902	-1.25	1.42
Negative Affect	0.66	1.07	0.284	-0.549	1.87
Intercept	97.0	235.4	0.000	96.2	97.8
EQ	7.81	20.0	0.000	7.03	8.57
EQ x Negative Affect	-0.51	-0.87	0.384	-1.654	0.638
Openness	-0.855	-1.16	0.249	-2.3	0.599
Intercept	96.8	235.6	0.000	96.0	97.6
EQ	8.0	20.4	0.000	7.20	8.73
EQ x Openness	0.923	1.31	0.19	-0.46	2.31
Neuroticism	0.392	0.811	0.418	-0.558	1.34
Intercept	96.8	235.4	0.000	96.0	97.6
EQ	8.0	20.4	0.000	7.20	8.73
EQ x Neuroticism	-0.374	-0.813	0.417	-1.28	0.53
Conscientiousness	-1.28	-1.79	0.074	-2.68	0.123
Intercept	96.8	236.0	0.000	96.0	97.6
EQ	8.0	20.4	0.000	7.20	8.73
EQ x Conscientiousness	0.957	1.41	0.159	-0.377	2.29
Agreeableness	-1.29	-1.86	0.064	-2.64	0.073
Intercept	96.8	236.0	0.000	96.0	97.6
EQ	8.0	20.4	0.000	7.20	8.73

EQ x					
Agreeableness	0.946	1.44	0.151	-0.348	2.24
Extraversion	0.248	0.393	0.695	-0.99	1.49
Intercept	96.8	235.3	0.000	96.0	97.6
EQ	8.0	20.4	0.000	7.20	8.73
EQ x Extraversion	0.02	0.033	0.974	-1.16	1.2

Note. CI = confidence interval.

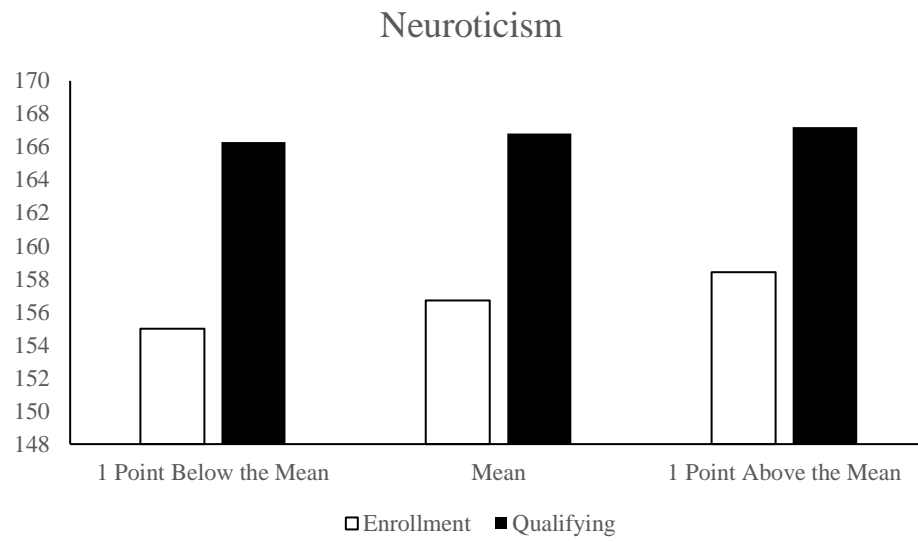


Figure 1. Enrollment and qualifying systolic blood pressure at three levels of neuroticism.

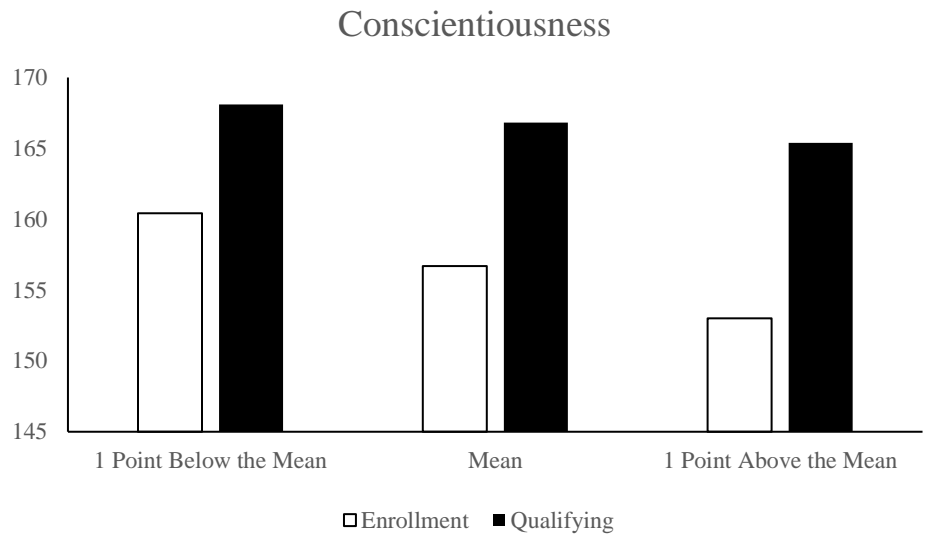


Figure 2. Enrollment and qualifying systolic blood pressure at three levels of conscientiousness.

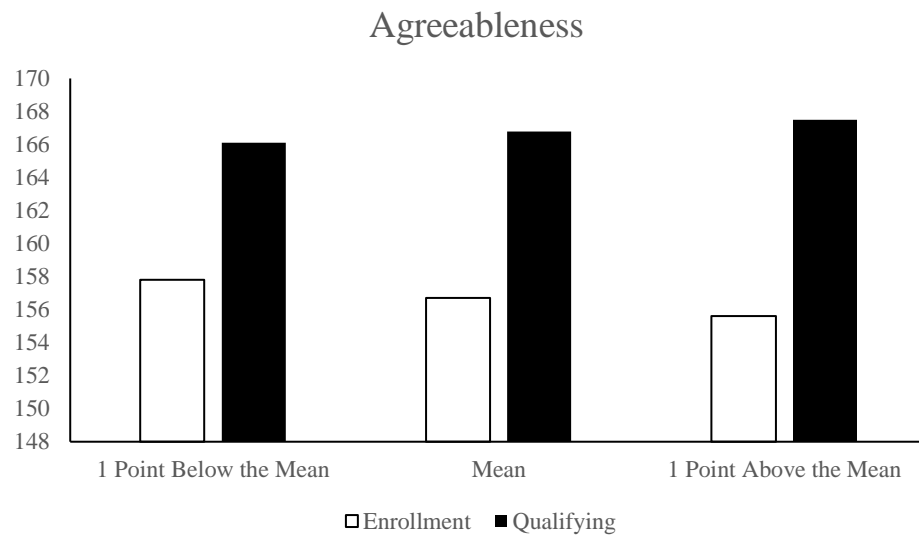


Figure 3. Enrollment and qualifying systolic blood pressure at three levels of agreeableness.

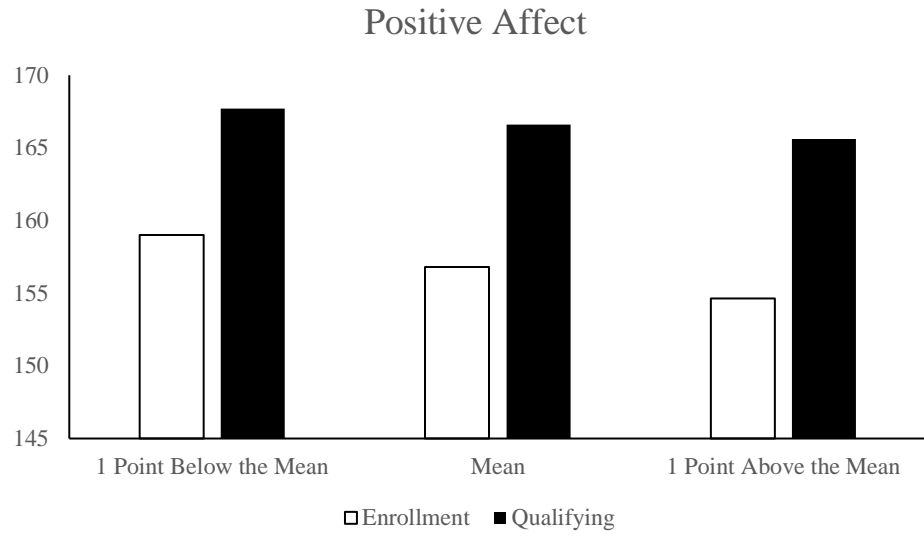


Figure 4. Enrollment and qualifying systolic blood pressure at three levels of positive affect.

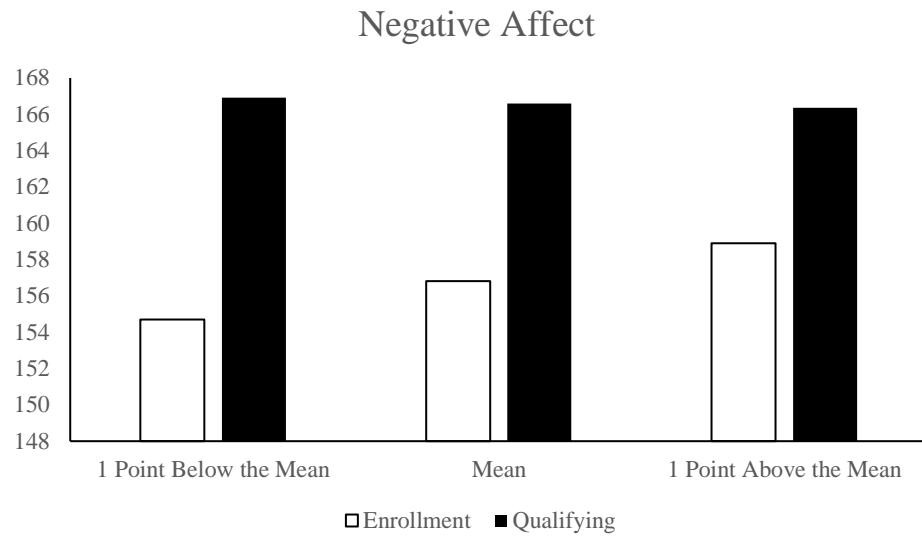


Figure 5. Enrollment and qualifying systolic blood pressure at three levels of negative affect.

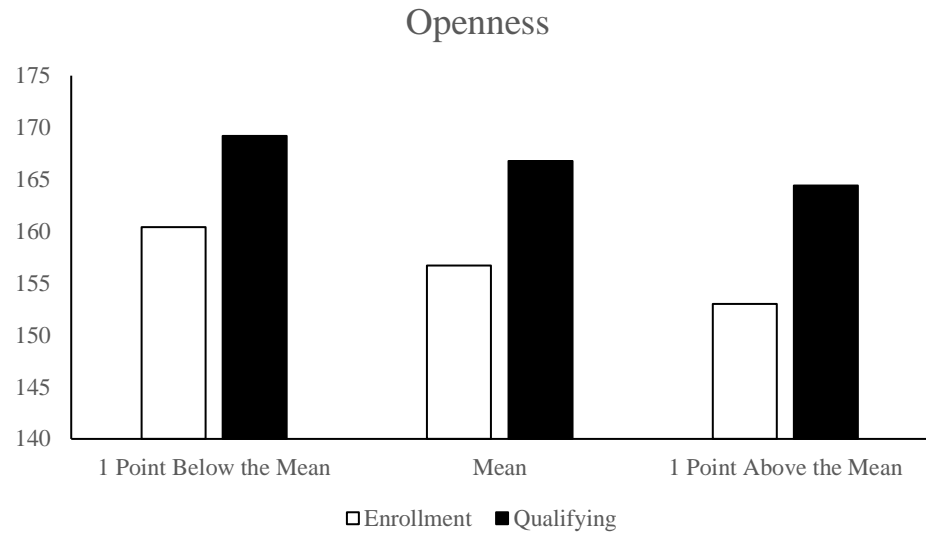


Figure 6. Enrollment and qualifying systolic blood pressure at three levels of openness.

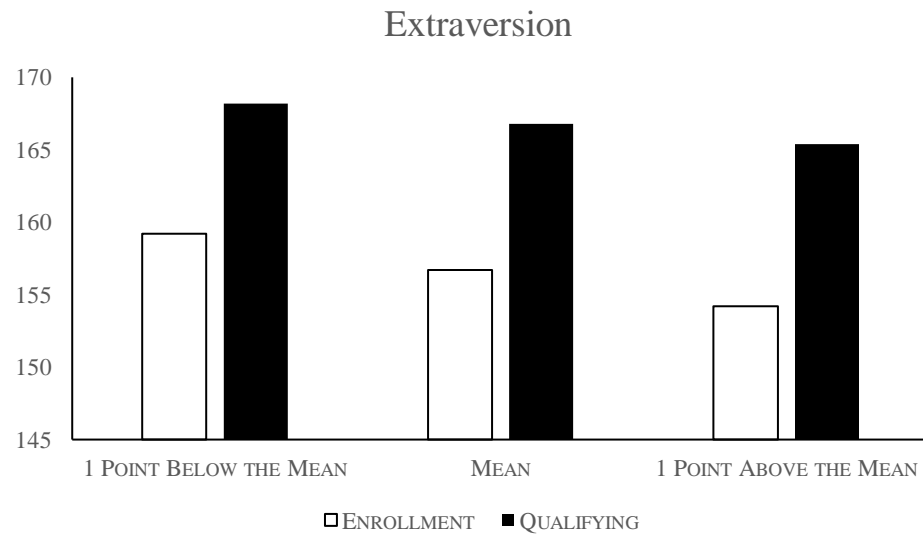


Figure 7. Enrollment and qualifying systolic blood pressure at three levels of extraversion.

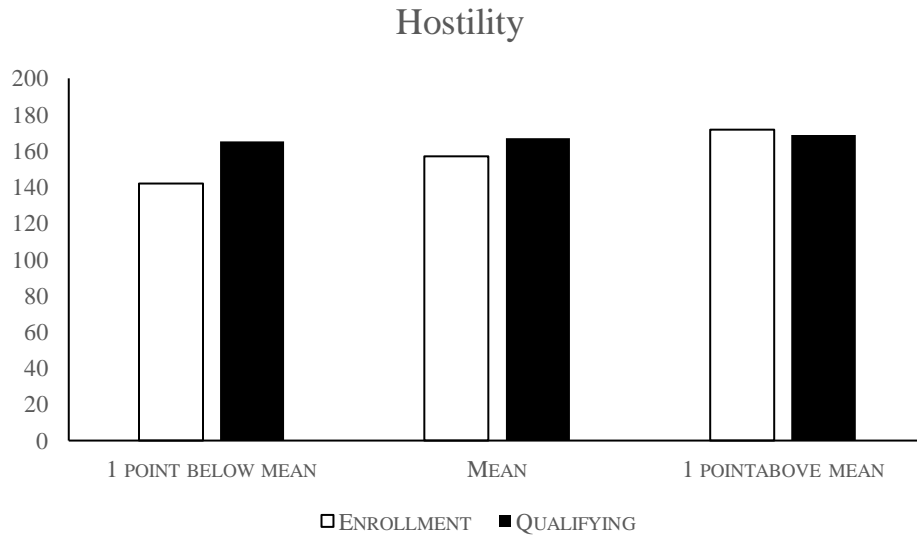


Figure 8. Enrollment and qualifying systolic blood pressure at three levels of hostility.

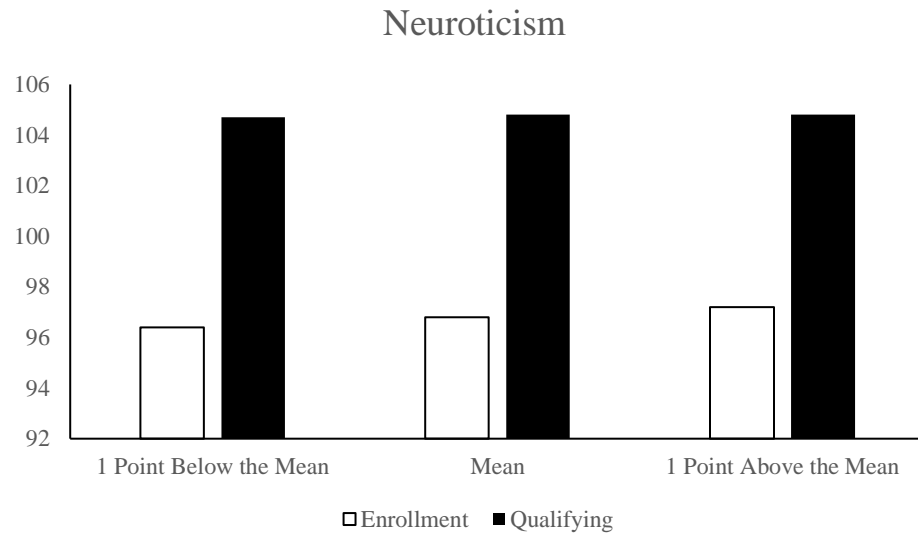


Figure 9. Enrollment and qualifying diastolic blood pressure at three levels of neuroticism.

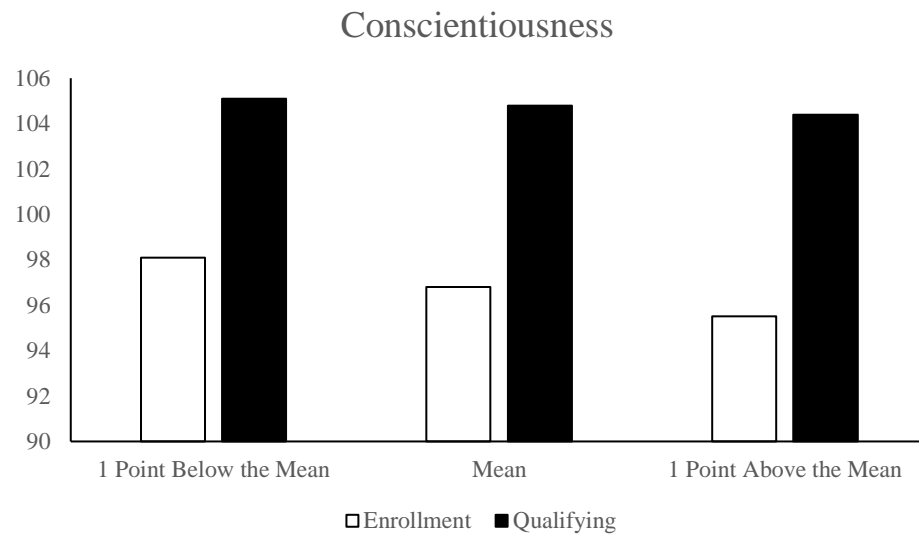


Figure 10. Enrollment and qualifying diastolic blood pressure at three levels of conscientiousness.

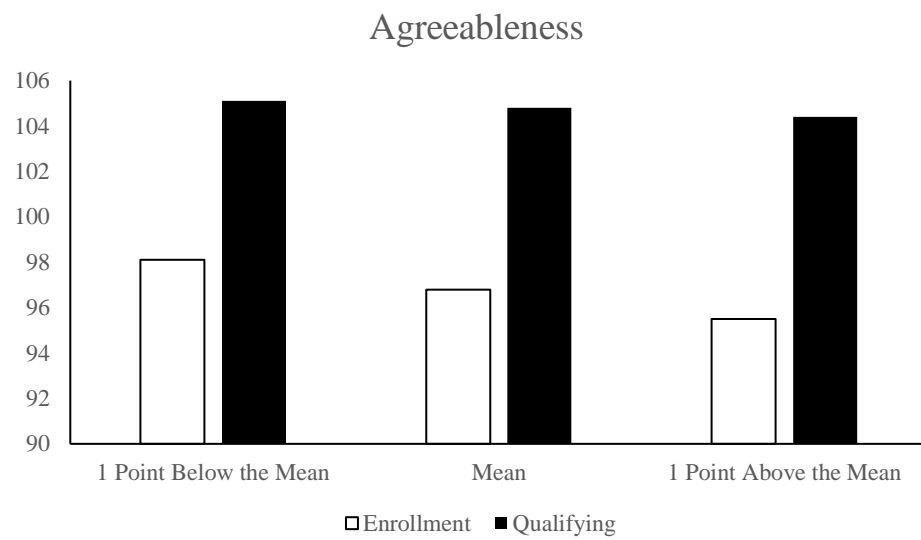


Figure 11. Enrollment and qualifying diastolic blood pressure at three levels of agreeableness.

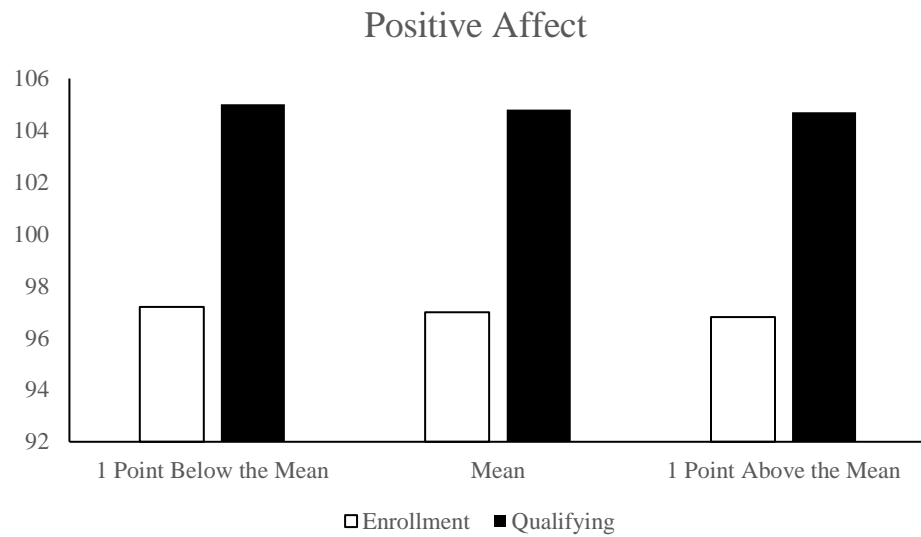


Figure 12. Enrollment and qualifying diastolic blood pressure at three levels of positive affect.

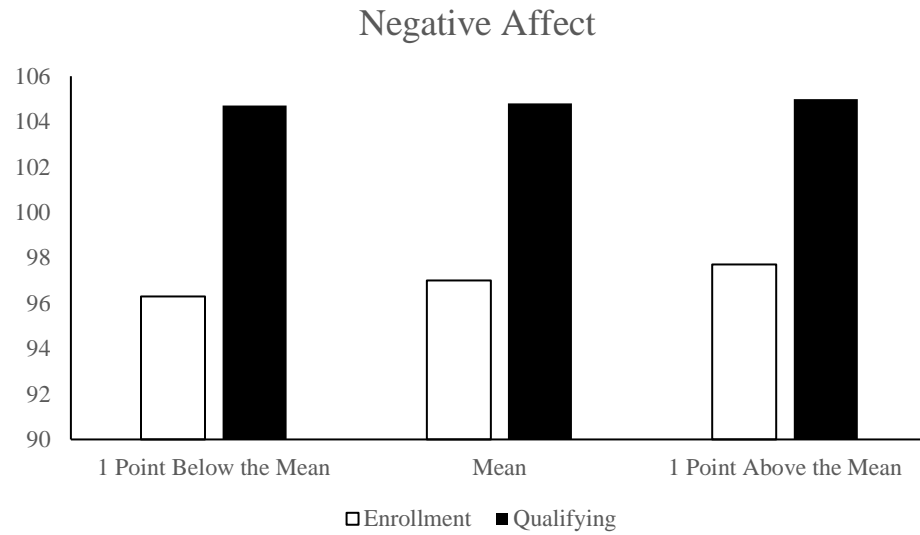


Figure 13. Enrollment and qualifying diastolic blood pressure at three levels of negative affect.

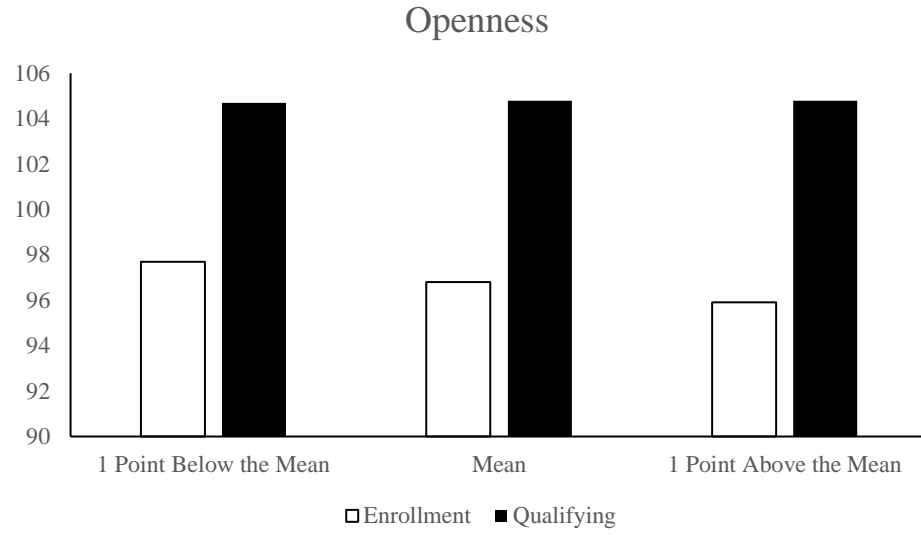


Figure 14. Enrollment and qualifying diastolic blood pressure at three levels of openness.

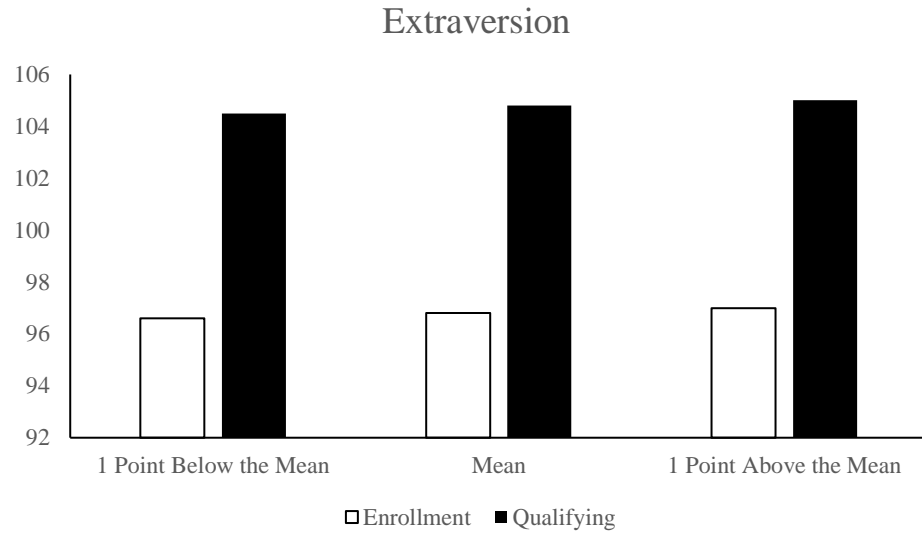


Figure 15. Enrollment and qualifying diastolic blood pressure at three levels of extraversion.

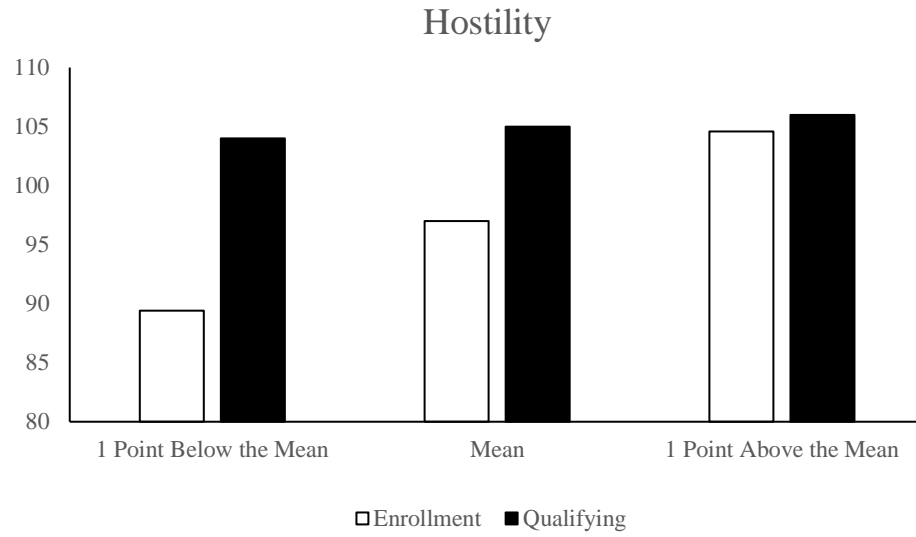


Figure 16. Enrollment and qualifying diastolic blood pressure at three levels of hostility.

APPENDIX A

BIG FIVE INVENTORY 54 (BFI-54)

Here are a number of statements that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Using the scale below, please blacken the corresponding number on the computer sheet provided to indicate the extent to which you agree or disagree with each statement.

1 5	2	3	4
Disagree Agree	Disagree	Neither	Agree
strongly	a little strongly	agree nor disagree	a little

I see myself as someone who . . .

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Is talkative. 2. Tends to find fault with others. 3. Does a thorough job. 4. Has a wide range of interests. 5. Is depressed, blue. 6. Is original, comes up with new ideas. 7. Is reserved. 8. Is helpful and unselfish with others. 9. Prefers the conventional, traditional. 10. Can be somewhat careless. 11. Is relaxed, handles stress well. 12. Is curious about many different things. 13. Is full of energy. 14. Prefers work that is routine and simple. 15. Starts quarrels with others. 16. Is a reliable worker. 17. Can be tense. 18. Is clever, sharp-witted. 19. Tends to be quiet. 20. Values artistic, aesthetic experiences. 21. Tends to be disorganized. 22. Is emotionally stable, not easily upset. 23. Has an active imagination. 24. Perseveres until the task is finished. 25. Is sometimes rude to others. 26. Has unwavering self-confidence. 27. Is inventive. 28. Is generally trusting. 29. Tends to be lazy. 30. Is clear-thinking, intelligent. | <ol style="list-style-type: none"> 31. Worries a lot. 32. Wants things to be simple and clear-cut. 33. Is sometimes shy, inhibited. 34. Has a forgiving nature. 35. Is idealistic, can be a dreamer. 36. Does things efficiently. 37. Can be moody. 38. Is ingenious, a deep thinker. 39. Generates a lot of enthusiasm 40. Can be cold and aloof. 41. Enjoys thinking about complicated problems. 42. Makes plans and follows through with them. 43. Remains calm in tense situations. 44. Likes to reflect, play with ideas. 45. Is considerate and kind to almost everyone. 46. Seeks adventure and excitement. 47. Gets nervous easily. 48. Is sophisticated in art, music, or literature. 49. Has an assertive personality. 50. Is insightful, sees different possibilities. 51. Likes to cooperate with others. 52. Is easily distracted. 53. Is outgoing, sociable. 54. Has few artistic interests. |
|---|--|

APPENDIX B

COOK-MEDLEY HOSTILITY SCALE (HO)

This inventory consists of numbered statements. Read each statement and decide whether it is true as applied to you or false as applied to you.

If a statement is **true or mostly true**, as applied to you, blacken the **1** on the computer sheet.

If a statement is **false or not usually true**, as applied to you, blacken the **2** on the computer sheet. If the item does not apply to you or if it is something that you don't know about, make no mark on the answer sheet.

Remember to give your own opinion of yourself. Do not leave any blank spaces if you can avoid it.

1 = TRUE

2 = FALSE

1. I prefer to pass by school friends, or people I know but have not seen for a long time, unless they speak to me first.
2. I am likely not to speak to people until they speak to me.
3. I have sometimes stayed away from another person because I feared doing or saying something that I might regret afterwards.
4. I am quite often not in on the gossip and talk of the group I belong to.
5. When I take a new job, I like to be tipped off on who should be gotten next to.
6. I am against giving money to beggars.
7. I like to keep people guessing about what I'm going to do next.
8. I frequently ask people for advice.
9. It makes me feel like a failure when I hear of the success of someone I know well.
10. When a man is with a woman, he is usually thinking about things related to her sex.
11. People can pretty easily change me even though I thought that my mind was already made up on a subject.
12. Someone has it in for me.
13. I commonly wonder what hidden reason another person may have for doing something nice for me.
14. I feel that I have often been punished without cause.
15. My relatives are nearly all in sympathy with me.
16. My ways of doing things are apt to be misunderstood by others.

17. I have often felt that strangers were looking at me critically.
18. I am sure I am being talked about.
19. I tend to be on my guard with people who are somewhat more friendly than I had expected.
20. The man who had most to do with me when I was a child (such as my father, stepfather, etc.) was very strict with me.
21. I have often found people jealous of my good ideas, just because they had not thought of them first.
22. I have frequently worked under people who seem to have things arranged so that they get credit for good work but are able to pass off mistakes onto those under them.
23. Sometimes I am sure that other people can tell what I am thinking.
24. It makes me impatient to have people ask for my advice or otherwise interrupt me when I am working on something important.
25. Some of my family have habits that bother and annoy me very much.
26. People often disappoint me.
27. I am not easily angered.
28. There are certain people whom I dislike so much that I am inwardly pleased when they are catching it for something they have done.
29. When someone does me a wrong, I feel I should pay him back if I can, just for the principle of the thing.
30. I don't blame anyone for trying to grab everything he can get in this world.
31. I can be friendly with people who do things which I consider wrong.
32. I do not blame a person for taking advantage of someone who lays himself open to it.
33. I would certainly enjoy beating a crook at his own game.
34. I have at times had to be rough with people who were rude or annoying.
35. I am often inclined to go out of my way to win a point with someone who has opposed me.
36. I do not try to cover up my poor opinion or pity of a person so that he won't know how I feel.
37. I strongly defend my own opinions as a rule.
38. I have often had to take orders from someone who did not know as much as I did.

- 39.I think a great many people exaggerate their misfortunes in order to gain the sympathy and help of others.
- 40.It takes a lot of argument to convince most people of the truth.
- 41.I think most people would lie to get ahead.
- 42.Most people are honest chiefly through fear of being caught.
- 43.Most people will use somewhat unfair means to gain profit or advantage rather than to lose it.
- 44.No one cares much what happens to you.
- 45.It is safer to trust nobody.
- 46.Most people make friends because friends are likely to be useful to them.
- 47.Most people inwardly dislike putting themselves out to help other people.
- 48.I have often met people who were supposed to be experts who were no better than I.
- 49.People generally demand more respect for their own rights than they are willing to allow for others.
- 50.A large number of people are guilty of bad sexual conduct.

APPENDIX C

PANAS

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way generally, that is, how you feel most of the time:

1	2	3	4	5
very slightly or extremely	a little	moderately	quite a bit	
not at all				
_____ interested			_____ irritable	
_____ distressed			_____ alert	
_____ excited			_____ ashamed	
_____ upset			_____ inspired	
_____ strong			_____ nervous	
_____ guilty			_____ determined	
_____ scared			_____ attentive	
_____ hostile			_____ jittery	
_____ enthusiastic			_____ active	
_____ proud			_____ afraid	

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