An Exploration of the Relationship between Visual Functioning and Personality

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Approval

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In partial fulfillment of the requirements for the degree of

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Abstract

The research into the relationship between vision and psychological characteristics has primarily focused on individuals with significant or complete vision loss, with few studies examining the relationship between correctable visual impairment and personality; however, the present study examined this relationship. Twenty-five students (19 women and 6 men) from Grenfell Campus, Memorial University of Newfoundland, ranging in age from 17-23, voluntarily participated in the study. Each participant's vision was measured using an autorefractor and a visual acuity eye chart. Personality characteristics were measured with the NEO-FFI. Self-perceived visual functioning was measured through a questionnaire and demographic information was collected. The results showed that there were no significant relationships between visual acuity and refractive error scores and the personality traits measured. There was no significant relationship between self-perceived visual functioning and measured visual functioning, demonstrating the limits of the self-report questionnaires of visual functioning. Limitations of the study and directions for future research are discussed.

An Exploration of the Relationship between Visual Functioning and Psychological Characteristics

The study of personality has long dominated many areas of psychology and, in turn, psychological research. From the investigation of possible genetic factors contributing to personality, to studies examining the variance in personality due to a range of factors such as age, gender, and race, personality is a concept in psychology that remains a central focus.

Interestingly, an area of research into personality that has received less attention is the relationship between sensory input and personality, specifically visual functioning. Personality is known to be influenced by many variables, one of the most important being the environment. The manner in which information from the environment is received through the senses, and, thus, the way in which the senses function, certainly influence the perception of the environment. Information from the environment is obtained through these senses, and is processed by the brain to give rise to numerous levels of experience. The way in which our senses function, therefore, must influence the overall perception of our surroundings. In other words, a heightening or reducing of the senses will alter the information obtained by that sense, thereby varying the information sent to the brain, which, in its finality, modifies the perception of the environment. Processing information from our visual centers is one of the most influential ways in which humans learn. It should therefore be apparent that if one individual's visual ability is different from another's, the two people will perceive the world in different fashions. When people perceive the environment in different ways, there are important implications.

A clear example of the implications of visual functioning on psychological

characteristics is evident in the impact of loss of vision. Laforge, Spector, and Sternberg (1992) state that a loss of visual functioning can lead to an increase in dependency, as well as an overall decrease in psychological functioning. In other words, a decrease in visual functioning was found to have a negative effect on cognitive functional level, which includes things such as dressing and bathing oneself, as well as transporting oneself from place to place. Rovner and Casten (2002) studied the effects of age-related macular degeneration and found that those who experienced vision loss of any level were more likely to show signs of depression. This is evidence that a change in visual functioning may play an important role in psychological health.

There are several terms important to understanding visual functioning. First, visual impairment is defined as any reduction or loss of vision in one or both eyes. There are essentially two categories of visual impairment: correctable and non-correctable. Correctable visual impairment is known as reduced vision that can be brought to a level of non-visual impairment through the use of appropriate means, such as corrective lenses or eye surgery. A 2008 report from the World Health Organization noted that correctable visual impairment is the major cause of mild to moderate visual impairment globally, accounting for 153 million cases worldwide (Resnikoff, Pascolini, Mariottia, & Pokharela, 2008). The prevalence of visual impairment in Canada is thought to be somewhere between 2.5% and 2.7%. In other developed countries, such as Australia and the United States, the prevalence rate is much higher, between 4% and 6.4% (Robinson et al., 1994; Schneider, Leeder, Gopinath, Wang, & Mitchell, 2010). The major cause of correctable visual impairment is refractive error. Refractive error is known as an inability of the eye to properly focus an image. There are two types of refractive error: myopia

(nearsightedness) and hyperopia (farsightedness). A third term, emmertropia, is a term used to describe someone with normal vision. Refractive error is typically corrected with the use of glasses or contact lenses, but can also be corrected through surgery. Uncorrected refractive error refers to not using glasses and/or contact lenses when needed, or not using the appropriate strength of glasses and/or contact lenses to correct a refractive error. Robinson et al. (2012) and Schneider et al. (2010) note that the prevalence of uncorrected refractive error in Canada is somewhere between 66% and 71.8%, and between 62% and 83.3% in other developed countries such as Australia and the United States.

Vision and Personality

While the impact of vision loss on psychological functioning has been demonstrated, the relationship between visual functioning and personality characteristics is less clear. Early studies examining vision and personality were aimed at investigating common stereotypes of individuals with glasses. These studies, while few in number, first examined others perceptions of people with glasses and found that the stereotypes did indeed exist (Thornton, 1943). It was found that people with glasses were seen as being more introverted, conscientious, industrious, and having interests that favored intellectual abilities, rather than athletic ones (Lennon, 1986; Manz & Lueck, 1968).

Young (1967) tested the relationship between myopia and variables such as intelligence, diet, growth characteristics, nearwork (i.e., performing activities at close range, such as reading or writing), and heredity. Young hypothesized that the visual deficits of myopia can lead a person to develop certain characteristics or personalities. By using the California Test of Mental Maturity and a questionnaire on refractive

characteristics with 554 college students, a positive relationship was found between refractive state and IQ; as myopic tendencies increased, so did intelligence. It was concluded that people with myopia tended to have higher IQ scores than those with hypermyopia or people with normal vision. It was also found that people with myopia were more likely to achieve, seek nurturance or care from others, and to think of themselves in a negative manner than those without myopia. Furthermore, Young stated that individuals with myopia are less oriented toward change in their lives and these activities helped with the lessened need for change. He also noted that individuals with myopia were more likely to feel the need to do their best at whatever task is undertaken and tended not to be satisfied unless they succeeded, which could contribute to their negative self-concept. An important limitation in this study was the use of a self-report questionnaire method to determine refractive characteristics; a common approach in this literature.

In a review of the literature by Lanyon and Giddings (1974) regarding vision and personality it was concluded that many studies have found a correlation between refractive error, more specifically myopia, and under-assertive and reserved personality characteristics. This meta-analytic article reviewed a number of studies on personality and refractive error, most of which again used the self-report questionnaire method to assess visual functioning. In short, Lanyon and Giddings found that people with myopia tended to be introverted, shy, and easily embarrassed in social situations. They concluded that research has shown that those with myopia tend to have relatively few friends, a self-centered personality, and prefer indoor activities such as reading, writing, and other intellectual activities.

Beedle and Young (1976) conducted a study regarding visual acuity and personality and also used a refractive condition questionnaire, as well as the Gough Adjective Checklist and the Omnibus Personality Inventory. The study included 782 introductory psychology students (297 people with myopia, 439 people with emmertropia, and 46 people with hypermyopia) and revealed that those with myopia differed from all others in their value systems and personality, as well as their physical characteristics. It was found that individuals with myopia were more likely to value academia and were more likely to be seen as "nerdy" by their peers. The study found that people with myopia tended to be more introverted, whereas those with hypermyopia tended to be more extroverted.

Coren and Hakstian (1989), in response to the lack of a standardized questionnaire to specifically measure visual acuity, designed the Acuity Screening Inventory (ASI). Through the development of their questionnaire to assess visual acuity, they attempted to address the limitations of self-report methods for determining visual acuity, noting the use of dichotomous response formats, too few items, and reliance on face valid items as the factors limiting the sensitivity of self-report measures (Coren & Hakstian, 1989). In 1995, Coren and Harland conducted studies on visual acuity and its correlation with personality. The first study used the Eysenck Personality Inventory (EPI) to measure personality and the Acuity Screening Inventory (ASI) to measure visual acuity. A total of 1014 undergraduate university students participated and it was found that reduced visual acuity was associated with lower scores on the extraversion component of the EPI. The second experiment tested 1148 participants on both the NEO-FFI and the ASI, and found very similar findings in that those with reduced visual acuity

had lower scores on extraversion. The NEO-FFI is a shortened version of the NEO-PI personality inventory, and is a brief measure of five main personality characteristics including neuroticism, extraversion, openness, agreeableness, and conscientiousness. While the use of the ASI represents an improvement in the measure of visual acuity over other self-report measures, it is still less accurate than an objective measure of visual acuity.

Lauriola (1997) found similar results in the extraversion/introversion category with those with refractive error. In this study, 88 participants from various optometric centres completed the Short Adjective Checklist, an Italian-derived questionnaire which measures the Big Five Personality Traits, and a scale of Activities Involving Near Vision, which was composed by the author of the study. Lauriola concluded that refractive error, more specifically myopia, was likely linked to personality traits such as conscientiousness and mental closeness, or industriousness.

Based on the previous research, there appears to be evidence of a correlation between myopia and particular personality characteristics, however, what is less understood is hypermyopia and its personality correlates. One notable study by Uretmen et al. (2005), examined 30 school children from the ages of 5-12, 15 with and 15 without known refractive error problems, on both visual functioning and personality. Uretmen et al. assessed the children's personality on the Children's Behavior Questionnaire (CBQ) Short Form, as well as the Children's Apperception Test (CAT-H). Vision was measured with prism and eye-cover tests on the Snellen eye chart. Both cycloplegic (temporarily freezing eye muscles to measure refractive error) refraction and best-corrected Snellen visual acuity were recorded for each participant. It was shown that, in general, the school

children with hypermyopia showed more aggression toward their parents than did children without hypermyopia.

More recently, van de Berg, Dirani, Chen, Haslam, and Baird (2008) investigated the relationship between myopia and the big five personality traits (Openness, Conscientiousness, Extraversion, Agreeableness, and Neuroticism) as measured by the International Personality Item Pool Five Factor Inventory. Refractive error was tested using an autorefractor, which is a computer-controlled instrument used to provide an objective measurement of refractive error qualities by measuring how light is changed as it enters the eye. Results showed that there was little or no correlation between any of the five central personality traits and myopia. While the study involved 1011 participants, the participants were gathered from two main sources: the Australian Twin Registry and a Melbourne Excimer Laser Clinic. While both twins and other family members exhibit similar myopic tendencies to the general population, that is, they represent a normal population with respect to their visual acuity (van de Berg et al., 2008), the relational status of twins may influence key factors of personality characteristics. In other words, personality traits may be very similar between family members, and not necessarily representative of a normally distributed population. Also, these participants were all patients seeking treatment for their visual problems. Those who seek laser eye surgery may have different personality characteristics than those who do not seek this treatment, again calling into question the representativeness of the sample.

Woods, Colvin, Vera-Diaz and Peli (2010) also recognized the problems with the self-perceived visual functioning questionnaire in determining one's own level of visual functioning and instead used a computer-controlled Badal optometer to measure just-

noticeable blur, as well as just-objectionable blur responses to positive lens defocus. Just-noticeable blur is the amount of defocusing of a stimulus is needed for someone to notice it as being "blurry", and just-objectionable blur is the amount of blur a person is unable to tolerate on a full-time basis (Atchison, Fisher, Pedersen & Ridall, 2005). They coupled this with NEO-FFI and the California Adult Q-sort (general measures) to measure personality, and used several author designed and hypothesis-driven scales of perfectionism, neuroticism, highly sensitive person (individuals who are sensitive to criticism), ego resiliency, need for structure, and negative emotionality. These hypothesis-driven scales were scales designed by the authors of the study. A total of 99 participants were tested on all measures and results revealed that those with higher blur tolerance were more likely to exhibit personality traits such as low self-confidence, disorganization, and perfectionism. Woods et al. (2010) stated that this study provides the first real evidence for personality correlates with blur tolerance, further demonstrating a link between visual functioning and personality characteristics.

Godtland (2012) in a study of vision and personality used the Howell Card Test to measure refractive error and the Myers-Briggs Personality Inventory to measure personality characteristics. The Howell Card Test is a test which uses a modified Thorington technique, in which the person simply has to tell which number the arrow on the card points to, which is indicative of a person's phoria, or a misalignment of the eyes. Fifty-four participants participated in the experiment, and it was found that there were no significant correlations between refractive error and personality types as measured by the Myers-Briggs Personality Inventory.

The Present Study

While there appears to be evidence of a relationship between visual functioning and personality characteristics, there is inconsistency in the literature and great variation in the methods used to assess each factor. The present study explored the relationship between psychological characteristics and visual functioning through thorough unquestionable objective measures of refractive error and visual acuity and a well-established measure of personality. Furthermore, this study also assessed the accuracy of self-perceptions of visual functioning, when compared to objective measures. It was hypothesized that individuals with myopia would score higher on agreeableness and neuroticism, and lower on extraversion, while those with hypermyopia would score higher on openness to experience and extraversion. It was also hypothesized that the self-report questionnaire method was an inaccurate measure of visual functioning, demonstrating the limits of the ability to accurately self-assess sensory functioning.

Method

Participants

A total of 25 undergraduate students from Grenfell Campus, Memorial University of Newfoundland participated in the study. The sample included 19 women with a mean age of 20.84 years (*SD* = 1.54) and a range of 17 to 22 years, and 6 men with a mean age of 19.83 years (*SD* = 1.72) and a range of 18 to 23 years.

Materials

There were two copies of the informed consent form outlining the purpose of the study, confidentiality, anonymity, task requirements, the right to withdraw, and contact information. One consent form was given to the participant to keep for their own records, while the other was signed and returned to the researcher (see Appendix A).

Following the completion of the consent form, participants were asked to complete the NEO-FFI personality inventory. The NEO-FFI, a short form of the NEO-PI-R, is a 60-item questionnaire which measures the big five personality traits: Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience. The psychometric properties of the NEO-FFI are well-established, showing high reliability and validity scores (Costa & McCrae, 1995). A five-item questionnaire assessing self-perceptions of visual functioning followed the NEO-FFI. All five questions were answered on a 5-point Likert scale with the response options: 1 – All of the time, 2 – Most of the time, 3 – Some of the time, 4 – A little of the time, 5 – None of the time. This scale assessed self-knowledge of visual functioning (see Appendix B).

An autorefractor was used to measure the presence of refractive error. An autorefractor is a computer-controlled instrument used to provide an objective

measurement of a person's refractive error qualities by measuring how light is changed as it enters the eye. Finally, to measure participants' visual acuity, a modified version of the standard eye chart was used (participants stood two metres away from the chart posted on the wall), with an occluder to cover the untested eye. The eye chart uses several rows of optotypes (i.e., test symbols) differing in size, which the participant reads to the best of his/her ability.

Procedure

Prior to testing, the researcher obtained permission from professors to enter classrooms during class time and inform students about the study being conducted. The details presented included the purpose of the study, tasks, and location. Students were informed, in all forms of advertising, that after participating in the study, they could enter their name in a draw to win a new IPOD, which occurred at the end of data collection was the prize of a 32GB 5th Generation Apple IPOD touch (see Appendix C for script). A sign-up sheet was passed around in the classroom for anyone wanting to sign their name and email address, to be contacted about a time to participate in the study. Furthermore, cards containing contact information for the researcher, with laboratory location and data collection time, were distributed to all students in the classes.

When a participant arrived at the psychology research area, the researcher greeted him/her and proceeded into the Duncan A. Ferguson laboratory where the study was conducted. First, the participant was asked to read, sign, and date an informed consent form and return it to the researcher, who placed it in an envelope. The participant kept an identical form. The participant completed the demographic questions, the self-perceived visual functioning questionnaire, and the NEO-FFI.

Upon completion of the questionnaires, the participant was asked to stand at line marked by tape at the appropriate distance from the visual acuity eye chart. Participants were instructed to keep their glasses on or contacts in, if they normally used correction. The researcher handed the occluder to the participant and asked the participant to cover his/her left eye and read the smallest line of letters they could on the chart without squinting. Next, the participant covered his/her right eye and again read the smallest line of letters he/she could without squinting. The participant was then asked to remove the occluder completely and read the smallest line of letters he/she could with both eyes uncovered. The researcher recorded the participant's visual acuity for each eye separately and together.

Next, the researcher asked the participant to sit at the autorefractor. The researcher asked the participant to remove glasses or contact lenses, if necessary. A sink, contact lens solution, and cases were available for participants to use, if needed. The participant was asked to sit on the chair in front of the autorefractor and to place his/her chin in the chin rest, and put his/her forehead against the forehead rest. The researcher ensured that the participant was properly positioned. The participant was asked to keep both eyes open and to look straight ahead. The autorefractor was positioned in front of the right eye and the participant was informed that he/she would be able to see a green dot. The participant looked straight ahead at the green dot while remaining seated. The researcher pressed a button on the control side of the autorefractor and the measurements were calculated instantly. The autorefractor was positioned in front of the participant's left eye and the test repeated. The measurements were printed and the chin rest and forehead rest of the autorefractor was cleaned with an alcohol swab in preparation for the

next participant.

Upon completion of these tasks, the participant was thanked for his/her participation. Each participant was given a ballot on which they could put his/her name and an e-mail address. The participant placed his/her ballot in a sealed box, from which the prize winner was drawn at the end of data collection. The researcher coded all of the participant's data, including the two questionnaires, the autorefractor data, and the data on the eye chart performance, with an identical code. The data and the signed consent forms were securely stored in separate locations.

Results

Descriptive statistics, multiple regressions, correlations, and t-tests were used to analyze data collected from the NEO-FFI personality inventory, the autorefractor, the visual acuity chart, and the self-perceived visual functioning questionnaire. Table 1 shows means, standard deviations, and ranges for mens' scores on each of the five personality factors. Table 2 shows means, standard deviations, and ranges for womens' scores on each of the five personality factors. One sample t-tests were conducted on each of the personality scores to determine if they differed from the university-aged norms provided in the NEO-FFI manual (Costa & McCrae, 1995). There were no significant differences between the sample of men tested and the published norms with respect to scores on neuroticism $t(5) = .355$, $p = .737$, extraversion $t(5) = -2.139$, $p = .085$, agreeableness $t(5) = -.386$, $p = .715$, and conscientiousness $t(5) = -.492$, $p = .644$. There was a significant difference with respect to scores on openness, $t(5) = 3.567$, $p = .016$, with participants in this sample scoring higher than those in the normative group. There were no significant differences in the sample of women tested with respect to the published norms on neuroticism $t(18) = -1.342$, $p = .196$, extraversion $t(18) = -1.238$, $p = .232$, openness $t(18) = .031$, $p = .976$, and conscientiousness $t(18) = 1.586$, $p = .130$. There was a significant difference with respect to women's scores on agreeableness, $t(18) = 2.378$, $p = .029$, with participants in this sample scoring higher than those in the normative group.

Table 1

NEO-FFI Personality Scores For Men

Personality Scores For Men			
Variable	M	SD	Range
Neuroticism	24.83	16.18	1 - 46
Extraversion	26.00	3.69	21 - 31
Openness	33.50	4.04	28 - 39
Agreeableness	27.83	5.88	23 - 37
Conscientiousness	28.83	6.85	19 - 39

n = 6

Table 2

NEO-FFI Personality Scores For Women

Personality Scores For Women			
Variable	M	SD	Range
Neuroticism	22.84	9.71	7 - 42
Extraversion	29.53	6.14	14 - 37
Openness	28.00	8.48	12 - 43
Agreeableness	34.21	5.88	23 - 45
Conscientiousness	33.47	6.74	20 – 45

n = 19

Since the sample consisted of individuals who wore glasses and those who did not, an independent sample t-test was conducted to determine if the personality traits of those who wore glasses differed from those who did not. Table 3 shows the means and

standard deviations for personality scores with respect to wearing glasses. There were no significant differences found on any of the five traits tested with respect to wearing glasses: neuroticism $t(22) = -.288$, $p = .745$, extraversion $t(22) = -.751$, $p = .788$, openness $t(22) = 1.859$, $p = .981$, agreeableness $t(22) = .329$, $p = .319$, and conscientiousness $t(22) = -.721$, $p = .531$.

Table 3

Descriptives - Glasses on Personality

Glasses on Personality			
Variable	Glasses	M	SD
Neuroticism	Yes	1.90	1.01
	No	2.02	.89
Extraversion	Yes	2.32	.50
	No	2.48	.47
Openness	Yes	2.63	.64
	No	2.13	.65
Agreeableness	Yes	2.73	.58
	No	2.66	.48
Conscientiousness	Yes	2.64	.63
	No	2.82	.52

$n_{glasses} = 15$
$n_{noglasses} = 9$

Self-Perceived Visual Functioning Questionnaire and Visual Perception

Correlations were conducted on answers to the self-perceived visual functioning questionnaire and scores on visual acuity. The questionnaire ranged from 1 to 5, with 1 being “all of the time” and 5 being “none of the time”. Questions four and five were reversed scored. Table 4 shows the means, standard deviations, and ranges for visual acuity scores. There was a significant correlation between question three on the self-perceived visual functioning questionnaire (M = 1.12, SD = .332) and visual acuity scores in the left eye, r = .484, n = 25, p = .014. Question three asked participants if their current vision allowed them to successfully complete daily tasks. There were no significant correlations found between question one (M = 3.44, SD = 1.85) and visual acuity scores r = .027, n = 25, p = .897. Question one asked the participants if they wore corrective lenses. Question two (M = 1.60, SD = .577) asked participants if they felt that they could see clearly. There was no significant relationship between question two and visual acuity scores r = .205, n = 25, p = .325. Question four (M = 4.72, SD = .737) asked participants if they felt their current vision limits the type of work and activities they do or how long they could do them. There was no significant relationship between question four and visual acuity scores, r = .017, n = 25, p = .935. Question five (M = 4.88, SD = .44) asked participants if they felt that their current vision prevented them from accomplishing their goals. There was no significant relationship between question five and visual acuity scores, r = .047, n = 25, p = .824. In other words, every other question pertaining to perceived visual functioning was not related to visual acuity scores.

Correlations were also conducted on answers to the self-perceived visual functioning questionnaire and refractive error scores. Table 5 shows the means, standard

deviations, and ranges for refractive error scores. There were no significant relationships found. In other words, every other question pertaining to perceived visual functioning was not related to refractive error scores. There was no significant relationships between question two and right eye S, r = -.311, n = 25, p = .131, between question three and right eye S, r = -.005, n = 25, p = .981, between question four and right eye S, r = -.317, n = 25, p = .123, and between question five and right eye S, r = -.098, n = 25, p = .641. There was no significant relationships between question two and right eye C, r = -.006, n = 25, p = .976, between question three and right eye C, r = .121, n = 25, p = .565, between question four and right eye C, r = .051, n = 25, p = .807, and between question five and right eye C, r = .049, n = 25, p = .816. There was no significant relationships between question two and left eye S, r = -.261, n = 25, p = .207, between question three and left eye S, r = -.011, n = 25, p = .957, between question four and left eye S, r = -.328, n = 25, p = .110, and between question five and left eye S, r = -.148, n = 25, p = .480. There was also no significant relationships between question two and left eye C, r = -.221, n = 25, p = .288, between question three and left eye C, r = .246, n = 25, p = .236, between question four and left eye C, r = .097, n = 25, p = .645, and between question five and left eye C, r = .128, n = 25, p = .543.

Table 4

Eye Chart Scores

Visual Acuity Scores			
Variable	M	SD	Range
VA right eye	25.40	8.16	15 - 50
VA left eye	23.60	3.69	20 - 30
VA both eyes	20.40	4.06	15 – 30

n = 25

Table 5

Autorefractor Scores

Refractive Error Scores			
Variable	M	SD	Range
Right eye S	-1.39	2.01	-6.50 - 1.50
Right eye C	-.68	.56	-2.50 - -.25
Left eye S	-1.35	2.21	-6.50 - 1.25
Left eye C	-.60	.41	-2.00 - -.25

n = 25

Visual Acuity and the Five Personality Factors

A Hierarchical multiple regression analysis was used to determine if personality scores could be predicted from visual acuity scores. The overall regression model was not significant $F(3, 21) = 2.287$, $p = .09$, $R^2 = .376$.

Refractive Error and the Five Personality Factors

A Hierarchical multiple regression analysis was used to determine if personality scores could be predicted from refractive error scores. The overall regression model was not significant, $F(4, 20) = 1.366$, $p = .28$, $R^2 = .264$.

Discussion

The purpose of this study was to examine the relationship between visual functioning and psychological characteristics, using valid, reliable, and widely used measures. Using the big five personality characteristics, it was hypothesized that people with myopia would score higher on neuroticism, agreeableness, and conscientiousness, and lower on extraversion and openness. It was also hypothesized that people with hypermyopia would score higher on openness and extroversion. There were no significant relationships found between scores on any of the personality factors and visual acuity. There were also no significant relationships found between scores on any of the personality factors and refractive error. Furthermore, it was hypothesized that the self-perceived visual questionnaire method would be an inaccurate measure of visual functioning. This hypothesis was supported as there were no significant relationships found between any instrumental measures of visual functioning and the self-perceived visual functioning questionnaire, with the exception of question number three and left eye visual acuity. There seems to be little that can be made of this one finding, only that the positive correlation suggests that as visual acuity in the left eye increases, one's perception of their ability to achieve daily tasks also increases. The interesting finding is the lack of a significant relationship between whether a person feels they see clearly and both refractive error and visual acuity scores, which demonstrates the inaccuracy of the self-assessment of visual functioning.

There have been attempts to address the concerns regarding self-report measures of visual functioning. Coren and Hakstian (1989) attempted to address this issue of potentially inaccurate self-report measures of visual ability, mainly by adding more

ecologically valid items and by switching from the standard dichotomous response format to a five-alternative, Likert-type response scale. Both of these actions were also taken in the development of the self-perceived visual functioning questionnaire used in this study. Furthermore, as Coren and Hakstian used both global and task-specific questions, the questionnaire in this study did the same. With all of these factors considered, the results were unable to demonstrate the accuracy of the self-perceived visual functioning questionnaire in this study.

It was shown that the personality scores on the NEO-FFI for this sample were fairly consistent with the norms provided in the NEO-FFI manual (Costa & McCrae, 1995). There were only two significant differences shown, which again provides evidence that, while the sample was small, it was a fairly representative sample for this university-aged population.

The lack of significant findings in this study should not be dismissed. It appears the more recent studies in this area (e.g., Godtland, 2012; van de Berg, Dirani, Chen, Haslam & Baird, 2008), which used more ecologically valid measures for both personality and visual ability, found similar results with respect to personality characteristics and visual functioning. This is not to say that visual ability and psychological characteristics are unrelated, but with the modernization of corrective lenses, as well as better and earlier detection programs for visual deficiencies, perhaps correctable visual impairment plays less of a role in personality. Any possible effects of visual impairment on personality characteristics are likely diminished as individuals are corrected for visual impairment at a very young age, negating the long-term effects of impaired eyesight. The Canadian Optometric Association (2013) note that by the age of

three, children should have undergone a thorough optometric eye examination to ensure vision is developing properly and that there is no evidence of eye disease. Any visual deficiency would be detected at that time and negate future impact.

Other researchers, such as van de Berg et al. (2008) suggest that the long-held view that people with myopia are introverted, conscientious, and neurotic may in fact reflect intelligence-related stereotypes rather than statistical relationships. Furthermore, the authors state that the predictive characteristic of intellectual ability, usually included in the general category of openness to experience, appears to represent a previously reported link between intellective abilities, such as IQ, and myopia, rather than personality.

There were limitations in the present study. The first limitation was sample size. With a limited number of participants, it is not only difficult to find relationships if they do exist, but it also difficult to generalize the findings to a larger population. With a low number of participants there is potential for low variability. The descriptives seem to suggest that the sample did in fact have limited variability, with most of the scores clustering around the mean. Thusly, with a small sample that appears to have low variability, it is difficult to detect significant relationships among variables.

A second limitation was the use of the NEO-FFI. While the NEO-FFI is a proven valid and reliable atheoretcial measure of the big five personality traits (Costa & McCrae, 1992), there are more extensive measures available. The NEO-PI-R provides a more detailed account of personality and may be a consideration for future studies similar in this area. Conversely, while the NEO-PI-R may be more comprehensive, it is also much longer, which is a limiting factor. The NEO-PI-R is a 120-item questionnaire that takes

approximately 30 minutes to complete. With such a long questionnaire as part of a study such as this one, the time commitment for volunteer participants may pose too much of an obstacle.

Finally, a third limitation is that there seems to be no set measure of overall visual functioning. While variables such as visual acuity and refractive error can be quantitatively measured, it appears as though an overall score for visual functioning is not possible, as it encompasses far too many variables all scored differently. This limitation however is only a statistical one, as many comprehensive measures of visual functioning are vital to understanding and treating any visual impairment. Thusly, the limitation only lies in the statistical analysis of overall visual ability and its relationship with personality.

The relationship between visual ability and personality characteristics is an area of psychology that has been relatively under-studied. Even less examined is the relationship between correctable visual impairments and personality characteristics. Previous studies in this area have yielded mixed results. While many studies involving correctable visual impairment and personality traits include large sample sizes and extensive testing, some of the methods used appear flawed. There has yet to be a consistent measure of visual functioning used in the literature, and few studies have examined relating personality characteristics in a standardized, atheoretical manner. In other words, it appears as though the literature provides a mix of different tests of vision and personality, with few using rigorous measures such as these in the present study. Future studies could examine the relationship between vision and psychological characteristics by using these proven methods of testing. It is imperative that tests involving the measurement of vision use equipment that is proven by vision experts to be

both reliable and valid.

In conclusion, this study investigated the relationship between visual functioning and psychological characteristics. From the results of this study, vision and personality characteristics were not significantly related. This study also investigated the accuracy of the self-perceived visual functioning questionnaire. The results showed that the self-perceived visual functioning questionnaire was an inaccurate measure of visual functioning. Overall, people were not accurate in assessing their visual ability. This study extended on the relatively limited literature involving vision and psychological characteristics; however, more research and larger sample sizes are needed to fully explore the relationship between visual ability and psychological characteristics.

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Appendix A

Vision and Psychological Characteristics
Informed Consent Form

The purpose of this informed consent form is to ensure you understand the nature of this study and your involvement in it. This consent form will provide information about the study, giving you the opportunity to decide if you want to participate.

Researchers: This study is being conducted by Michael Watton as part of the course requirements for Psychology 4951, Honours Project in Psychology. I am under the supervision of Dr. Jennifer Buckle of the Grenfell Campus Psychology program.
Purpose: The purpose of this study is to investigate the relationship between vision and psychological characteristics.
Task Requirements: You will be asked to complete two questionnaires and two measures of vision. You will be asked to remove your glasses or contact lenses (if you wear them) for one measure of vision
Locale and Duration: You will be asked to complete this study in a Grenfell Campus, Psychology Lab room. The study will take approximately 20 minutes to complete.
Risks and Benefits: There are no obvious risks or benefits involved with your participation in this study.
Anonymity and Confidentiality: All data obtained in this study is confidential. It is important not to make any identifying marks on your questionnaires. To ensure anonymity the data you provide will be kept separate from your informed consent form. Please feel free to omit any questions you do not wish to answer. The information obtained in this study will be analyzed on a group basis, therefore individual responses will not be available or identified. The results of this study will be presented, used to write an honours thesis, and may be published in the future.
Right to Withdraw: Your participation in this research is totally voluntary and you are free to stop participating at any time.
Contact Information: If you have any questions or concerns about the study or if you are interested in receiving the results of this research, please contact Michael Watton at mdwatton@grenfell.mun.ca, or Dr. Jennifer Buckle at 639-6524 or at jlbuckle@grenfell.mun.ca. If you would like to hear a presentation on the results of this study, you are invited to attend a psychology research conference at Grenfell Campus, Memorial University of Newfoundland at the end of March, 2013.

This study has been approved by an ethics review process at Grenfell Campus, Memorial University of Newfoundland.

I acknowledge that I have been informed of, and understand, the nature and purpose of the study, and I freely consent to participate. I have also received a copy of the informed consent form for my records.

Signature _____ Date _____

Appendix B

Vision Questionnaire

1) Do you wear glasses or contact lenses?

1	2	3	4	5
All of the time	Most of the the time	Some of the time	A little of the time	None of the time

2) Do you feel that you see clearly (with glasses or contact lenses if you wear them)?

1	2	3	4	5
All of the time	Most of the the time	Some of the time	A little of the time	None of the time

3) Does your current vision (with glasses or contact lenses if you wear them) allow you to successfully complete daily tasks?

1	2	3	4	5
All of the time	Most of the the time	Some of the time	A little of the time	None of the time

4) Does your current vision (with glasses or contact lenses if you wear them) limit the type of work and activities you do or how long you can do them?

1	2	3	4	5
All of the time	Most of the the time	Some of the time	A little of the time	None of the time

5) Do you feel that your current vision (with glasses or contact lenses if you wear them) prevents you from accomplishing your goals?

1	2	3	4	5
All of the time	Most of the the time	Some of the time	A little of the time	None of the time

Appendix C

Scripts

Script for Classroom

Researcher: Hello, my name is Michael Watton and I am conducting a study for my Psychology 4951 Honours project and I would like to take a minute to explain the basics of the study, and invite you to participate. I am studying the relationship between sensory input, more specifically vision, and psychological characteristics and I would greatly appreciate it if you would volunteer your time to come to a psychology laboratory, to participate in this study. The study will take about 20 minutes to complete. You will be asked to complete two questionnaires, look at an eye chart, and look into an instrument that will assess visual functioning. It should be noted that I will be testing participants individually, not in a group setting. Anonymity and confidentiality will be maintained, as all of the data collected will be analyzed on a group basis. You do have the right to stop participating in the study if you wish to do so. Again, this is completely voluntary participation, and you do not have to participate if you do not want to. If you choose participate in this study you can enter your name in a draw for a chance to win a new 32GB 5th Generation Apple IPOD Touch. I would greatly appreciate your participation. If you would like to participate, please put your name and a phone number or e-mail address on the sheet and I will contact you about a time to complete the study that works for you. I will also distribute a card with my contact information and times that I will be in the lab, if you want to drop by to participate. Thank you for your time.

Script for Lab

Hi and welcome to the lab. Thank you very much for choosing to participate in this study, it is greatly appreciated. Are there any questions before we begin? Here is an informed consent form (hands participant consent form) that you can read, sign, and date with today's date and then hand back to me, and here is a copy of the consent form for you to keep. I will place your signed form in this envelope, separately from the data. Next I'd like you to complete this demographics questionnaire (hands participant demographics questionnaire) and when you're done, hand it back to me. Next, I'd like you to complete this NEO-FFI questionnaire (hands participant NEO-FFI) and when you're done, hand it back to me. (After NEO-FFI is completed and handed back to researcher) Next I would like you to complete this questionnaire on your vision (hands participant self-perception of vision questionnaire) and hand it back to me when you are done.

Please follow me to the eye chart here on the wall. I will ask you to take a seat here, and keep your glasses on, or contacts in, if you have them. I am now going to take a visual measurement. I want to make it clear that I am not a trained eye-care professional; I am only getting visual data for research purposes. You should note that you are not expected to be able to read all of the lines on the chart. (Researcher hands occluder to the participant) Could you please cover your left eye now? I'd now like you to read the smallest line of letters that you can on the chart, without squinting. Next, cover your right eye and do the same. Next, I'd like you to remove the occluder completely and read the smallest line of letters you can, with both eyes uncovered.

Please follow me over to the autorefractor. I will ask you to first remove your

glasses or contact lenses if you are wearing any. A sink and contact lens solutions and cases are available for you to use, if needed. Next, I would like you to sit on the chair in front of the autorefractor and place your chin in the chin rest, and put your forehead against the forehead rest. (After making sure participant is properly positioned) I would like to ask you to keep both eyes open and to look straight ahead. You will first be able to see a green dot with your right eye. I'd like you to look straight ahead at the green dot while remaining otherwise still. (Researcher presses button on autorefactor). Now I will do the same thing with your left eye. You are now done. Thank you very much for your time and participation in this study. If you would like to fill out a ballot, please do so at this table and place it in the sealed box to be drawn at the end of the study.