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**Neurotypes: Do OCD, ADHD, and Autism Play a Role in Life Satisfaction?**

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Departmental Honors Thesis  
The University of Tennessee at Chattanooga  
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## Abstract

OCD (Obsessive Compulsive Disorder), ADHD (Attention Deficit Hyperactivity Disorder), and ASD (Autism Spectrum Disorder) are neurotypes that impact every aspect of life, including daily activities and socialization, which is why they have been shown in prior studies to negatively impact life satisfaction. This study compared the levels of life satisfaction now and before the COVID-19 pandemic in young adults ( $n = 324$ ) with typical neurotypes, those with only ASD (autism), with only OCD, with only ADHD, with two of the neurotypes, and with all three neurotypes. Contrary to predictions from prior research, life satisfaction did not decrease after the onset of the COVID-19 pandemic; all neurotypes had increased or the same life satisfaction now. The hypothesis that each neurotype would have different levels of life satisfaction was supported; OCD, ADHD, and ASD symptoms each have unique negative impacts on life satisfaction. In this sample, OCD, ADHD, and ASD symptoms accounted for approximately 15% of the variation in life satisfaction, with autism having the greatest impact.

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## **Neurotypes: Do OCD, ADHD, and Autism Play a Role in Life Satisfaction?**

### **Background**

ASD (Autism Spectrum Disorder), ADHD (Attention Deficit Hyperactivity Disorder), and OCD (Obsessive Compulsive Disorder) are considered to be neurotypes, which means they are entirely different from the ‘normal’ neurotype (neurotypical) (Siu et al., 2021). A neurotype is defined as a cluster of similar neurological and cognitive ways of being (Rosqvist et al., 2020). As a result, autistic adults, adults with ADHD, and adults with OCD have different needs in order to live satisfied lives; those needs are sometimes met, but sometimes they are not. The specific question this study will be answering is: how does life satisfaction vary across autistic adults, adults with ADHD, adults with OCD, and neurotypical adults? This question is an important one; life satisfaction of parents of autistic children is frequently studied, but there are fewer studies on whether or not autistic people themselves are satisfied with their lives (Salas et al., 2017; Sotoudeh Navroodi et al., 2018). Oftentimes autistic people, people with ADHD, and people with OCD suffer from a lack of support, unemployment, and lack of social services to help them live satisfied and fulfilled lives (Hennig et al., 2017; Remmerswaal et al., 2016; Schmidt et al., 2015; Sørensen et al., 2004). However, many adults with OCD, ADHD, or autism do get the support and understanding that they need to lead satisfying lives, so it is important to consider life satisfaction statistics when trying to understand if people with OCD, people with ADHD, and autistic adults’ support needs are being met (Schmidt et al., 2015).

Autism Spectrum Disorder, also referred to as ASD, is a neurodevelopmental disability that affects an individual throughout their entire life, from birth through adulthood (National Collaborating Centre for Mental Health (UK), 2012). According to the American Psychiatric

Association (2013) in their discussion of the criteria for autism diagnosis, the essential features of ASD are persistent difficulties in reciprocal social interactions or communications, as well as repetitive and restricted patterns of behavior or interests; these symptoms must also be present from early childhood and limit everyday functioning. Additionally, it is important to understand that autism is a spectrum; some autistic adults have high support needs or a comorbid intellectual disability and may be non-verbal or require assistance from a caregiver, whereas others are verbal and may have lower support needs and be able to live independently. The sample of the autistic population for this study will be those with lower support needs. Autism also often impairs social functioning more as an individual reaches adulthood; many autistic adults who have learned how to compensate for some social challenges still struggle in new situations and suffer from anxiety, since they need to consciously think about aspects of social interaction that come naturally to neurotypicals (American Psychiatric Association, 2013).

Autism is also not uncommon, which is shown in the study done by the CDC's ADDM Network; in 2016, ASD prevalence was 18.5 out of every 1,000 eight-year-old children (Maenner et al., 2016). In other words, this study concluded that approximately one out of every 54 children has autism. The rates of autism have also increased in recent years due to the broadening of diagnostic criteria, which was done with the aim to diagnose all autistic individuals, not just those with comorbid intellectual disabilities (Gernsbacher et al., 2005). The scale chosen to quantify autism in the present study is the Autism-Spectrum Quotient (AQ). It consists of 50 questions and it can be used to help determine if an individual has autism and its severity; the questions assess social skill, attention switching, attention to detail, communication, and imagination. The AQ scores range from 0 to 50; the higher the person's score, the more autistic traits they have (Baron-Cohen et al., 2001).

The life satisfaction of those with ASD has been studied before in many different ways, however, the demographics of their populations and the scale used to quantify autism vary. Schmidt et al. (2015) used the German Quality of Life Questionnaire (also known as the FLZ) to quantify autism, the World Health Organization Disability Assessment Schedule 2.0 (WHODAS 2.0) to quantify life satisfaction, and included an additional measure to quantify IQ. They found that despite their sample of autistic people having an average IQ, they reported more impairments than neurotypicals in understanding and communication, school and work, as well as social interaction and participation in society. They also found that autistic people are generally less satisfied with their lives, and that they were significantly less satisfied in their social relationships than the neurotypical group. Through statistical analysis, they also concluded that the only significant predictor for life satisfaction in autistic people was their ability to participate in society (Schmidt et al., 2015). A study by Mazurek (2014), which used the AQ-Short to quantify autism, the SWLS to quantify life satisfaction, and additional measures to quantify loneliness and friendships found strikingly similar results: they found that loneliness is likely a secondary consequence of social impairment, and that loneliness was the only significant predictor of life satisfaction in the autistic adults studied. Another study by Franke et al. (2019), which studied autistic adolescents, used the SCQ (taken by the caregiver) to quantify autism and used the SCQ and BMSLSS to quantify life satisfaction. They also found similar results to the previous two studies, concluding that the overall life satisfaction of autistic adolescents was lower than that of their peers, and that optimism, school support, family coherence, and self-efficacy were the most significant predictors of life satisfaction (Franke et al., 2019).

ADHD, or Attention Deficit Hyperactivity Disorder, is a neurotype that is characterized as a persistent pattern of inattention and/or hyperactivity–impulsivity that interferes with



functioning or development (American Psychiatric Association, 2013). Typically those with ADHD experience difficulties giving attention to details and maintaining attention to tasks, often misplace items necessary for tasks, and struggle with impulse control (which often presents as fidgeting, excessive talking, or interrupting others while they are speaking) (American Psychiatric Association, 2013).

According to the American Psychiatric Association (2017), about 8.4% of children and 2.5% of adults have ADHD, which makes ADHD even more common than autism. The Adult ADHD Self Report Scale, also referred to as the ASRS, is the scale used in the present study to quantify ADHD (Kessler et al., 2005). The ASRS was developed by the World Health Organization with the aim of effectively diagnosing ADHD in adulthood. The ASRS is an 18 item 5-point Likert scale that is regarded as an excellent preliminary screening tool for ADHD, and was found to have high diagnostic accuracy; the shorter ASRS performed equally well as the full ASRS (Brevik et al., 2020).

Much like the previous research on autism, previous studies on ADHD and life satisfaction typically differ in the demographics of their sample as well as the scales used to quantify ADHD and life satisfaction. In a study of medication-treated adults with ADHD, researchers found that work and interpersonal difficulties appeared to be the most common areas of life-impairment, which are uniquely associated with their number of ADHD symptoms (Safren et al., 2009). Another study focused on the life satisfaction of Chinese medical students with ADHD; they used a Chinese version of the ASRS to evaluate their current ADHD symptoms, the Wender Utah Rating Scale (WURS) to evaluate their childhood ADHD symptoms, the SWLS to quantify life satisfaction, and used an additional measure (the Connor–Davidson Resilience Scale (CD-RISC)) to quantify resilience. They found that the

medical students with ADHD had lower levels of resilience than the students without ADHD, that lower levels of resilience were correlated with higher levels of inattention, and that higher levels of inattention were associated with lower life satisfaction in their sample. This led the researchers to hypothesize that inattention causes those with ADHD psychological distress, which in turn causes lower levels of resilience and life satisfaction (Shi et al., 2018). A study on adults with ADHD by Hennig et al. (2017) used the ADHD Screening for Adults (ADHS-E) to quantify ADHD, the SWLS to quantify life satisfaction, and included additional measures to quantify social support and depressive symptoms. They found that ADHD symptoms impair life satisfaction more than common risk factors (low social support and depressive symptoms), but that these common risk factors were still relevant mediating factors; this means that alleviating depressive symptoms and finding more social support may help those with ADHD experience an increase in life satisfaction. These results are similar to those found in studies on autism and life satisfaction, suggesting that social support may be a mediating factor for both ASD and ADHD (Hennig et al., 2017; Schmidt et al., 2015).

OCD, or Obsessive Compulsive Disorder, is defined as a disorder characterized by obsessions and/or compulsions (American Psychiatric Association, 2013). Obsessions are defined as recurrent and persistent urges, thoughts, or images that are unpleasant or unwanted, whereas compulsions are defined as repetitive mental acts or physical behaviors that a person feels compelled to do in response to an obsession or according to strict rules that they feel must be followed (American Psychiatric Association, 2013). In other words, it is a neurotype that is characterized by repetitive thoughts (obsessions) and repetitive behaviors (compulsions). OCD was once categorized as an anxiety disorder, however, the DSM-V re-classified OCD into a new obsessive compulsive disorders category (American Psychiatric Association, 2013). Although

less commonly referred to as a neurotype than autism, OCD is shown to be a true neurotype by Siu et al. (2021) in their study of the biological differences between people with OCD, ADHD, ASD, and neurotypicals, where they reported biological changes in a specific gene (OXTR) that differentiate ASD, ADHD, and OCD from the neurotypical population. This shows that there are genetic differences in those with OCD, which supports the argument that it is its own distinct neurotype.

The APA also provides statistics that show that OCD is relatively common; they found that the prevalence of OCD in the United States is roughly 1.2%, and that it was similarly prevalent internationally (1.1%-1.8%; The American Psychiatric Association, 2013). In short, OCD is about as common as autism and it also greatly affects the way a person lives and what they are capable of doing throughout their entire lives, which in turn affects the life satisfaction and happiness of those with OCD (Remmerswaal et al., 2014). The scale that will be used to quantify OCD in this study is called the Yale-Brown Obsessive Compulsive Scale (Y-BOCS); it consists of ten questions that ask about how much time participants spend thinking about and acting on obsessive-compulsive thoughts (Goodman et al., 1989).

Similarly to studies on autism and ADHD and life satisfaction, there have also been studies regarding OCD and life satisfaction, and what varies between most existing studies are the scales used to quantify OCD and life satisfaction as well as the demographics of their samples. One study conducted by Remmerswaal et al. (2016) studied of quality of life and relationship satisfaction of adults with OCD; they did not include a measure to quantify OCD since their participants were recruited from the The Netherlands Obsessive Compulsive Disorder Association, and measured life satisfaction using the EuroQol five dimensional questionnaire (EQ-5D), and included an additional measure to quantify relationship satisfaction. According to

this study, OCD greatly affects a person's quality of life in a negative way; they found that quality of life was poor in those with OCD, that their relationship satisfaction was moderate, and that lack of employment and comorbidity with more severe depressive and anxiety symptoms were associated with a poorer quality of life (Remmerswaal et al., 2016). This shows that like autism and ADHD, OCD affects the way a person lives, works, and socializes to a degree that affects their life satisfaction negatively. In another study conducted by Sørensen et al. (2004), they used the Danish version of the Y-BOCS to quantify OCD as well as a questionnaire designed for this study to quantify the impact of the participants' OCD on their life satisfaction. They found that 72% of participants reported that their OCD impacted their social functioning, 57.1% reported it impacted their class attendance, 72% reported that it affected their daily life functioning (cooking, shopping, etc.), and 15% also reported that it affected their daily life functioning constantly (Sørensen et al., 2004). They reported that 62% of participants have had suicidal thoughts, that 11% have attempted suicide, and that 26.5% were dissatisfied with their quality of life (Sørensen et al., 2004).

Autism, ADHD, and OCD typically have comorbidities. According to the American Psychiatric Association (2013), about 70% of people with autism may have one comorbid mental disorder, and 40% may have two or more comorbid mental disorders. One common comorbidity of ASD is OCD; according to Leyfer et al. (2006) in their study on the comorbidities of autism, the second most frequent disorder found in the DSM-IV was OCD, and that it was diagnosed in 37% of the children in their study with autism. They also found that the most frequent DSM-IV disorder in autistic individuals was specific phobias. They found that the third most common diagnosis was ADHD, and that it was diagnosed in 31% of the children in their study with autism, but that the rate increased to almost 55% when they included subsyndromal cases

(Leyfer et al., 2006). Leyfer et al. (2006) also found that when they included subsyndromal cases, the rate of major depression was almost 24%. These findings are supported by the DSM-V, where it states that adults and adolescents with ASD are prone to anxiety and depression (American Psychiatric Association, 2013).

ADHD in adults has been found to be highly comorbid with anxiety, mood, behavior, and substance use disorders (Fayyad et al., 2017). Another study by Babcock and Ornstein (2009) found agoraphobia and social phobia to be the most common comorbid anxiety disorders in adults with ADHD; interestingly, they found that the only anxiety disorder that adults with ADHD did not have an increased risk of was OCD. They also found that adults with ADHD were three times more likely than the general population to experience substance use disorder and major depressive disorder, and that people with ADHD were more likely to have bipolar disorder (Babcock & Ornstein, 2009). OCD has been found to be associated with a greater risk of mood disorders (including depression and bipolar disorder), generalized anxiety disorder, SUD, and alcohol abuse (Osland et al., 2018). Another study also found that the prevalence of bipolar disorder in people with OCD is approximately 17-18% (Amerio et al., 2015).

Overall, autism, OCD, and ADHD have many common comorbidities, including (but not limited to) anxiety disorders, mood disorders, and behavior disorders. In this study, there are no scales used to measure anxiety or depression, but the demographic questions "Do you believe you have any of the following mental health conditions?" and "Have you been diagnosed with any of the following mental health conditions?" gave participants the opportunity to self-report any mental health conditions.

Life satisfaction is, in short, how satisfied a person is with their life as a whole. As one can imagine, in order to find out how satisfied a person is with their life as a whole, one typically needs to figure out how satisfied they are with different categories of their life, such as their satisfaction in their work or social life. According to Franke et al. (2019) one way to measure life satisfaction is the BMSLSS (or Brief Multidimensional Students' Life Satisfaction Scale) (Huebner, 1994). The BMSLSS is a short and to the point assessment that does evaluate many areas of life satisfaction, however, its use in adults is not appropriate since it was designed to evaluate teenagers (Seligson et al., 2003). A second way to measure life satisfaction is the German Quality of Life questionnaire (also called the FLZ) (Henrich & Herschbach, 2000). The FLZ evaluates satisfaction in 10 domains of life including health, job, income, leisure time, and partnership; it also makes possible the assessment of general life satisfaction, which does not take into account the scales for job, partnership, and relationship with their own children (Henrich & Herschbach, 2000; Fahrenberg et al., 2000; Schmidt et al., 2015). The FLZ is a great way to measure life satisfaction in adults, but it is not commonly used in American research since it is designed to be administered in German rather than English, and resources to learn more about the FLZ are often only available to those who can read German. This means that like the BMSLSS, the FLZ should not be used to study American adults when it can be avoided. Another way to measure life satisfaction is the SWLS; using the Satisfaction with Life Scale, participants indicate their agreement with five statements on a 7-point Likert scale (1 = strongly disagree to 7 = strongly agree). The responses are then averaged to result in a total score, with higher scores indicating greater life satisfaction (Griffiths et al., 2019). The SWLS is the most commonly used scale for life satisfaction in American research because it was designed to be administered in English (unlike the FLZ) and it is appropriate for studies on adults, unlike the

BMSLSS, which makes it the most suitable scale out of the three for the present study. Overall, there are many ways to evaluate life satisfaction, and all ways incorporate satisfaction in different aspects of a person's life to determine overall life satisfaction; however, the SWLS is the scale most commonly used in research on American adults.

According to previous research, autism, ADHD, and OCD all have major effects on life satisfaction because of their impacts on how a person lives and socializes; autism and ADHD both affect a person's social skills and time management, and the obsessive thoughts and time consuming compulsions that OCD causes affect how much time a person has in a day to work and socialize. The amount of life satisfaction people with OCD, ADHD, and autism have is important to measure because life satisfaction directly impacts a person's overall happiness. The effects autism has on life satisfaction are shown in the study by Schmidt et al. (2015); they found that individuals with ASD experienced significant functional impairments and less life satisfaction in many areas of life compared with nonclinical individuals. The effects of OCD are shown in a study by Sørensen et al. (2004); they reported that people with OCD found it significantly influenced their academic, occupational, and social functions, and that these factors had a corresponding influence on their quality of life in general. They also found that there were significant levels of comorbidities in their sample, as well as significant levels of suicidal tendency.

Although autism, ADHD, and OCD had all been studied in their correlations with life satisfaction separately, there had been no comparison of the life satisfaction of adults with OCD to adults with ADHD or autism. Therefore, the hypothesis of this study was that neurotypical adults, adults with OCD, adults with ADHD, adults with autism, and adults with any combination of the three neurodivergences would all have different levels of life satisfaction

when compared to each other. One important thing to note is that the current COVID-19 pandemic may have altered participants' life satisfaction, since it has caused significant lifestyle changes for many people. The degree of alteration in life satisfaction by the pandemic may also vary depending on if the participant has ADHD, OCD, or ASD. A study by Davidson et al. (2021) found that 72% of autistic respondents reported that they had either some or significant deterioration in mental health since the beginning of the pandemic, and the most common reasons provided by participants for their deterioration in mental health were disruptions in their normal routine and uncertainty for the future. Another study by Golfarb et al. (2022) supports the results found by Davidson et al. (2021); they found that participants with autism who continued their normal routine of going to work in-person maintained pre COVID-19 levels of mental health, while those who lost their jobs showed significant decreases in mental health, and those who transitioned to working from home showed marginally significant decreases in mental health and significant decreases in their satisfaction of work-related psychological needs. Some autistic people may also need to slowly transition back to their pre-pandemic level of socialization, since regression of social skills from lack of use can be anxiety-provoking (Baweja et al., 2022). Social support for many people has been impacted by the COVID-19 pandemic as well, and therefore may impact current levels of life satisfaction; it particularly may have an impact on the life satisfaction of participants with ADHD in the current study. This theory is supported by a study by Sibley et al. (2021) on adolescents and young adults with ADHD that used a top problems assessment to evaluate the effects of the current pandemic on the participants; they found that 41.5% of participants reported that social isolation was a top problem, 20.3% reported that difficulties with online learning was a top problem, and 21.3% reported boredom as a top problem. Participants' parents were also surveyed, and 27.9% of



parents of adolescents or young adults with ADHD reported that motivation was a top problem for their child during the pandemic (Sibley et al., 2021). In a study conducted by Wheaton et al. (2021), 58.3% of participants with OCD reported that their concerns regarding the COVID-19 pandemic had become an obsession related to their OCD, and 44.7% were equally afraid of becoming infected with COVID-19 themselves and infecting others. A majority (76.2%) of participants reported that their OCD has worsened since the onset of the pandemic, 19.8% reported that the severity of their symptoms had not increased, and only 4.0% said their OCD had improved (Wheaton et al., 2021).

## **Hypotheses**

The primary hypothesis of this study was that neurotypical adults, adults with OCD, adults with ADHD, adults with autism, and adults with any combination of the three neurodivergences would all have different levels of life satisfaction when compared to each other. Another hypothesis of this study was that OCD, ADHD, and ASD symptoms would have unique negative impacts on life satisfaction. It was also hypothesized that a decrease in life satisfaction of all neurotypes would be seen between March of 2020 and now (2022) due to the COVID-19 pandemic.

## **Methodology**

### **Participants**

Young adults (ages 18 to 29 years-old) were recruited from the UTC Psychology Department Sona research participation system, the UTC Disabilities Resource Center, the Chattanooga Autism Center, and social media. Most (84.26%) of the sample of young adults was recruited through the UTC Psychology Department Sona research system. A Qualtrics survey

was sent to participants, the first page of which was a consent form that participants agreed to before completing the survey. A total of 345 participants completed the survey, but 21 were excluded due to being out of the age range. The mean age of the sample was 20.6 years old with a standard deviation of 2.39 years; 73.6% of the sample reported their sex as female, while 13.5% of the sample was male. The majority of the sample (68.4%) was white, 10.7% were African American, 3.1% was Asian, and 6.4% of the sample preferred not to say or preferred to self-describe.

Based on the participants' self-report of what diagnoses they have (if any), the final set of participants was composed of 6 adults diagnosed with ASD only, 44 adults diagnosed with ADHD only, 11 adults diagnosed with OCD only, 14 adults diagnosed with 2 of the neurodivergent neurotypes, 3 adults diagnosed with all 3 neurodivergent neurotypes, and 248 neurotypical adults with none of the three primary diagnoses.

## **Materials**

The materials included scales to measure characteristics of ASD, ADHD, and OCD as well as current and past life satisfaction and demographic characteristics. In total, there were 106 questions.

The first measure used in this study is the Autism-Spectrum Quotient (AQ), which quantified the autism variable. The AQ consists of 50 questions and it can be used to help determine if an individual has autism and its severity; the first 10 questions assess social skill, the second set of 10 questions assess attention switching, the third set of 10 questions assess attention to detail, the fourth set of 10 questions assess communication, and the fifth set of 10

questions assess imagination. According to Baron-Cohen et al. (2001), the AQ scores range from 0 to 50; the higher the person's score, the more autistic traits they have.

The second scale used was part A of the Adult ADHD Self-Report Scale (ASRS) to quantify ADHD; the ASRS is a 5-point Likert scale that consists of 18 questions split up into two sections (part a and part b) and can be used to as a preliminary screening to determine if a person has ADHD (Kessler et al., 2005). Part A of the ASRS has 6 questions and can be used alone as a screening instrument, and part B contains 12 additional questions based on the DSM criteria that can provide additional insight into a patient's symptoms. Part A of the ASRS was found by Kessler et al. (2005) to perform better as a screener for ADHD by itself than when parts A and B were administered together; they found that it performed better in sensitivity, specificity, and total classification accuracy. However, they suggested that clinical calibration in larger samples may someday find that the full ASRS is preferable to the 18 or 6 question versions, but since their research was first published in 2005, part A has been found to be optimal to be used to distinguish cases of ADHD from non-cases (Ustun et al., 2017). The stability and test-retest reliability of the ASRS part A was also found to be strong when used to assess ADHD in college students (Gray et al., 2014).

The next scale used was the Yale-Brown Obsessive Compulsive Scale (Y-BOCS), which measures the variable OCD. The Y-BOCS is a test to determine the severity of OCD symptoms, and this scale has been used frequently in research. The ten questions on this scale, written by Goodman et al. (1989), ask about how much time participants spend thinking about and acting on obsessive-compulsive thoughts; a score of below 8 is subclinical, 8-15 is mild, 16-23 is moderate, 24-31 is severe, and 32-40 is extreme.

The last survey utilized in this study is the Satisfaction with Life Scale (SWLS), which measures the variable life satisfaction. The SWLS is a short five item measure of overall life satisfaction and has been used frequently in research since its creation by Diener et. al (1985). A score of 20 represents neutral on the scale, therefore scores 5-9 indicate extreme dissatisfaction with life, and scores 31-35 indicate extreme satisfaction with life. In order to measure the effects of the arguably ongoing COVID-19 pandemic on life satisfaction, participants were given the SWLS twice, the first time with instructions to think about their life before the COVID-19 pandemic in March of 2020, and the second time with instructions to think about their life since the onset of the COVID-19 pandemic.

Participants were also asked demographic questions. This included questions asking participants about their age, gender, sex, sexual orientation, race, religion, if they have been diagnosed with a mental disorder before (diagnosis options included anxiety, depression, OCD, ADHD, ASD, bipolar disorder, borderline personality disorder, schizophrenia, other mental health condition, or none/prefer not to say) and if they suspect they have any mental health conditions.

## **Procedure**

Participants were chosen through convenience sampling by sending a Qualtrics survey to participants through the University of Tennessee at Chattanooga's psychology department's SONA portal, the Chattanooga Autism Center, and social media. Participants were informed on the requirements of the study, what to expect, and informed that they can exit the study at any time without penalty. Participants then gave consent to participate. The participants could expect the study to take roughly 30 minutes. Participants were given the Y-BCOS, the AQ, ASRS, the

SWLS, and demographic questions. Upon completing all surveys, participants submitted their survey answers, then read a message debriefing them and thanking them for their time. The researcher then scored each participant's surveys and performed statistical analyses.

## **Results**

The final set of participants was composed of 6 adults diagnosed with only ASD, 44 adults diagnosed with only ADHD, 11 adults diagnosed with only OCD, 14 adults diagnosed with 2 of the neurodivergent neurotypes, 3 adults diagnosed with all 3 neurodivergent neurotypes, and 248 neurotypical adults with none of the three diagnoses; there were significantly more participants with only ADHD than only OCD or ASD, which is typical of a young-adult population. None of the participants diagnosed with only ASD were recruited from the University of Tennessee at Chattanooga's psychology Sona system, whereas all of the participants diagnosed with only OCD were recruited from the Sona system. The majority of participants diagnosed with only ADHD were recruited from the SONA system (37 out of 44), and the same can be said for those diagnosed with 2 or all 3 of the neurotypes (11/14 and 2/3 respectively). As mentioned in the background of this study, ADHD is also more common (2.5% of adults) than OCD (1.2%) and ASD (1.9%) overall (American Psychiatric Association, 2013; American Psychiatric Association, 2017; Maenner et al., 2016). Those with OCD and ASD also made up a large portion of the participants who were diagnosed with 2 of the neurodivergent neurotypes.

Correlational, multivariate, and analysis of variance approaches were used to 1) compare the differences in mean life satisfaction between adults with autism, adults with ADHD, adults with OCD, adults with any combination of the three conditions, and neurotypical adults and 2)

determine whether the level of ASD, ADHD, and OCD symptoms predicted life satisfaction. It was predicted that adults with each of the three neurotypes, each combination of the three neurotypes, and neurotypicals would each have different levels of life satisfaction. It was also predicted that ASD, ADHD, and OCD symptoms negatively impact life satisfaction, and that the COVID-19 pandemic had a negative impact on life satisfaction.

Two questions giving participants a chance to self-report their ADHD, OCD, autism, or other mental health conditions were presented at the end of the demographics section of the survey: "Do you believe you have any of the following mental health conditions?" and "Have you been diagnosed with any of the following mental health conditions?"; the responses to these two questions were evaluated using a series of analyses comparing neurotype diagnosis, other mental health diagnosis, suspected neurotype, and suspected other mental health disorder to life satisfaction pre and post-COVID.

### **Neurotype diagnosis**

A repeated measures ANOVA using mean total life satisfaction both before and after the onset of the pandemic and the 'have you been diagnosed?' question found that all groups of participants (the groups being 'no diagnosis or prefer not to say', 'only ADHD', 'only OCD', 'only ASD', '2 neurotype diagnoses', and 'all 3 neurotype diagnoses) have significantly higher life satisfaction now than compared to before the pandemic, excluding the group that included those with all three diagnoses, whose mean life satisfaction remained the same. However, as shown in Table 1 below, there was no diagnosis by time interaction overall, and the life satisfaction of the groups did not change at significantly different rates. As shown in Table 2 below, the control group (no diagnosis) had a slightly higher mean total life satisfaction now

compared to before the onset of COVID (21.9 before compared to 22.6 now, out of a maximum score of 35). This level of life satisfaction in the control group was expected, since a neutral level of life satisfaction is a score of 20. The ADHD-only diagnosis group had the lowest mean life satisfaction now (17.9) when compared to the mean life satisfactions of the OCD-only (20.82) and autism-only (18.5) groups; the ASD-only diagnosis group had the lowest mean life satisfaction before the onset of the pandemic (15.67) when compared to the mean life satisfactions of the OCD-only (17.8) and ADHD-only (16.8) groups. The only statistically significant difference in life satisfaction before COVID was between those with no neurotype diagnosis and those diagnosed only with ADHD, as shown in Table A13 in the appendix. As shown in Table A1, there were significant differences seen in life satisfaction now between multiple groups: the life satisfaction of the no diagnosis group was significantly higher than that of the only-ADHD group and the 3 diagnoses group, the life satisfaction of the OCD-only group was significantly higher than the 3 diagnoses group, and the life satisfaction of the 3 diagnoses group was significantly higher than that of the 2 diagnoses group. There were no significant differences between the ASD-only group and any of the other conditions. As shown in Table A14, the only groups that had statistically significant differences in life satisfaction now compared to before the onset of the pandemic were the no diagnosis group and the 2 diagnoses groups. All neurotype diagnosis groups were in the slightly dissatisfied range of life satisfaction (15-19) both before the beginning of the pandemic and now, excluding the OCD-only group, which had a neutral level of life satisfaction after the pandemic (20.82).

Table 1: ANOVA (Life Satisfaction Pre-COVID, Life Satisfaction Now, &amp; Neurotype Diagnosis)

| Source  | Partial Eta Squared | Type III Sum of Squares | DF | <i>F</i> | <i>p</i> |
|---|---------------------|-------------------------|----|----------|----------|
| Life Satisfaction Before COVID and Life Satisfaction Now (Time)                       | .023                | 124.988                 | 2  | 6.780    | .010     |
| Neurotype Diagnosis   | .087                | 2535.838                | 5  | 5.537    | <.001    |
| Life Satisfaction Before COVID and Life Satisfaction Now (Time) * Neurotype Diagnosis | .030                | 162.662                 | 10 | 1.765    | .120     |

Table 2: Neurotype Diagnosis and Mean (and Standard Deviation) of Life Satisfaction (before COVID and now)

| Neurotype Diagnosis | Life Satisfaction Now<br>M | (SD)   | Life Satisfaction Before COVID<br>M | (SD)   |
|---------------------|----------------------------|--------|-------------------------------------|--------|
| No diagnosis        | 22.54                      | (6.81) | 21.69                               | (7.64) |
| ADHD                | 17.93                      | (8.22) | 16.84                               | (9.08) |
| OCD                 | 20.82                      | (8.11) | 17.82                               | (6.34) |
| Autism              | 18.50                      | (8.50) | 15.67                               | (6.12) |
| 2 diagnoses         | 22.00                      | (6.22) | 16.64                               | (6.93) |
| 3 diagnoses         | 11.67                      | (2.08) | 11.67                               | (1.53) |
| Total               | 21.57                      | (7.28) | 20.36                               | (8.02) |



A one-way ANOVA was performed using the self-reported neurotype diagnoses and the mean total scores on the ASRS, AQ, and Y-BOCS to evaluate how each diagnosis group performed on each measure. This was done as a validity check to see if participants reported the symptoms expected of their diagnosis. I predicted that the group with only ADHD would score the highest on the ASRS, the group with only OCD would score the highest on the Y-BOCS, and the group with only ASD would score the highest on the AQ. As shown in Table A12 in the appendix, on the AQ those diagnosed with ASD only scored the highest out of the three neurotypes; on the Y-BOCS, those diagnosed with OCD only scored the highest out of the three neurotypes. These results were expected, since the AQ quantifies ASD symptoms and the Y-BOCS quantifies OCD symptoms. However, as shown in Table A12, on the ASRS part A those diagnosed with only ASD had a slightly higher (but not significantly higher) average score than those diagnosed with only ADHD, which was unexpected since the ASRS quantifies ADHD symptoms. Further analysis of this data can be found in the Comparing Scale Scores by Neurotype Diagnosis section of the appendix.

Overall, it was found that: 1) All diagnosis groups have the same or higher life satisfaction now than before the onset of the pandemic. 2) There was no diagnosis by time interaction overall. 3) The life satisfaction of the diagnosis groups did not change at significantly different rates. 4) The differences in mean life satisfaction now were significant between the following groups: No diagnosis and ADHD-only, OCD and 3 diagnoses, 3 diagnoses and no diagnosis, and 3 diagnoses and 2 diagnoses. 5) The only groups with a significant difference in life satisfaction before the onset of COVID were the ADHD and no diagnosis groups. 6) Those with only OCD scored highest on the Y-BOCS, and the ASD-only group scored highest on the

AQ, which was expected; however, the ASD-only group scored slightly higher than the ADHD-only group on the ASRS part A, which was unexpected.

### **Suspected Neurotype Diagnosis**

A repeated measures ANOVA was performed using mean total life satisfaction before the beginning of the pandemic and now and participants' *suspected* neurotype (based on answers to the question "Do you believe you have any of the following mental health conditions?") was performed; according to Table A6 and Table A7 in the appendix, the control group (does not suspect they have ADHD, OCD, or autism) has slightly higher total life satisfaction now compared to before COVID (mean total life satisfaction of 21.3 compared to 22.2). The group that believes they have only autism had lowest mean total life satisfaction both before the pandemic and now (14.6 and 15.8). It was found that the change in life satisfaction between before and after the onset of the pandemic was not significantly correlated with suspected neurotype ( $p = .865$ ).

### **Other Mental Health Diagnosis**

Many individuals with and without OCD, ASD, and ADHD have other mental health conditions such as anxiety and depression that can impact life satisfaction, which is why participants were given the option to self-report diagnosed or suspected mental health disorders as well as diagnosed or suspected neurotype. A majority (63.7%) of the neurotypical participants reported no mental health diagnosis, 29.5% of participants diagnosed with ADHD reported no other mental health diagnosis, 16.7% of participants diagnosed with ASD reported no mental health diagnosis, 7.1% of those with 2 neurotype diagnoses reported no mental health diagnosis, and 0% of those with OCD or those diagnosed with all 3 neurotypes reported no other mental

health diagnosis. Out of the neurotypical patients, 8.5% reported they were diagnosed with anxiety, 2.0% reported a depression diagnosis, 0.8% reported another mental health diagnosis, 19% reported 2 other mental health diagnoses, and 6.0% reported 3 or more other mental health diagnoses. As shown in Table 3, many people with ASD, OCD, or ADHD reported that they had 2 or more other mental health diagnoses; 45.5% of people diagnosed with only ADHD, 90.9% of people diagnosed with only OCD, 50% of people with only autism, 85.7% of people with 2 of the neurotypes, and 66.6% of people with all 3 of the neurotypes reported 2 or more mental health diagnoses. The prevalence of multiple comorbid mental health disorders is consistent with a young-adult population.

Table 3: Neurotypes and Other Mental Health Diagnoses

|                        |                 | Other Mental Health Condition    |         |            |                            |                |                |
|------------------------|-----------------|----------------------------------|---------|------------|----------------------------|----------------|----------------|
|                        |                 | None/<br>Prefer<br>not to<br>say | Anxiety | Depression | Other<br>mental<br>illness | 2<br>diagnoses | 3<br>diagnoses |
| Neurotype<br>Diagnosis | No<br>diagnosis | 63.7%                            | 8.5%    | 2.0%       | 0.8%                       | 19.0%          | 6.0%           |
|                        | ADHD            | 29.5%                            | 18.2%   | 4.5%       | 2.3%                       | 27.3%          | 18.2%          |
|                        | OCD             | 0.0%                             | 9.1%    | 0.0%       | 0.0%                       | 72.7%          | 18.2%          |
|                        | ASD             | 16.7%                            | 0.0%    | 16.7%      | 16.7%                      | 33.3%          | 16.7%          |
|                        | 2<br>diagnoses  | 7.1%                             | 7.1%    | 0.0%       | 0.0%                       | 57.1%          | 28.6%          |
|                        | 3<br>diagnoses  | 0.0%                             | 0.0%    | 33.3%      | 0.0%                       | 33.3%          | 33.3%          |
| Total                  |                 | 53.1%                            | 9.5%    | 2.8%       | 1.2%                       | 23.9%          | 9.5%           |

Another repeated measures ANOVA was performed using self-reported mental health disorder diagnoses; answers were divided into the categories of “none or prefers not to say”, “only diagnosed with anxiety”, “only diagnosed with depression”, “only diagnosed with another disorder”, “diagnosed with 2 disorders”, and “diagnosed with 3+ disorders.” As shown in Table

A8 and Table A9 in the appendix, the control group (not diagnosed with mental illness or prefers not to say) had a slightly higher total life satisfaction now compared to before the onset of COVID and was in the ‘slightly satisfied’ range of life satisfaction at both times (23.3 now and 22.8 before). The group diagnosed only with anxiety had only a slightly lower life satisfaction than the control group both before the pandemic and now (22.8 before and 22.6 after); this group had a slightly lower mean life satisfaction now than before the beginning of the pandemic. All other groups had a higher life satisfaction now than before the start of the pandemic; those with 3 or more diagnoses had the lowest life satisfaction now (15.8 before and 18.4 after), but those diagnosed only with depression had the lowest life satisfaction before the pandemic (15.0 before and 20.1 after). Those with 2 diagnoses had the second lowest life satisfaction now and the third lowest life satisfaction before the pandemic (18.0 before and 19.6 after). Those diagnosed with a different mental illness had a mean life satisfaction of 25.0 before the pandemic and 26.0 now, both of which are greater than that of the control group. As shown in Table A15, it was found that the differences in life satisfaction between the following groups were statistically significant before the beginning of COVID-19: the no diagnosis group and only depression group, the no diagnosis group and the 2 diagnoses group, the no diagnosis group and 3 or more diagnoses group, the anxiety-only group and the 2 diagnoses group, and the anxiety-only group and the 3 or more diagnoses group. As shown in Table A16, it was found that the differences in life satisfaction were statistically significant now between the no diagnosis group and 2 diagnosis group, and the no diagnosis group and 3 or more diagnoses group.

A repeated measures ANOVA was performed again, this time using the self-reported suspected mental health conditions. All groups had higher total life satisfaction now compared to before the pandemic. As shown in Table A10 and Table A11 in the appendix, the control group

(suspects no disorders/ prefers not to say) had a mean life satisfaction of 22.6 before the pandemic and 23.5 now, so was considered to be ‘slightly satisfied’ with life at both times. Those who suspect they have 3 or more disorders had the lowest mean life satisfaction both before the pandemic and now (16.0 before and 16.9 now) and those who suspect they have a disorder not listed had the second lowest mean life satisfaction both before and after the beginning of the pandemic (16.9 before and 17.0 now). Those who suspect only depression had the third lowest life satisfaction before the pandemic (17.4 before and 20.8 now), and those who suspect 2 disorders had the third lowest mean total life satisfaction now (18.0 before and 19.1 now). The average of 20.8 of life satisfaction now in the depression-only group was surprising, since a score of 20 represents a neutral level of life satisfaction. Those who suspected they have anxiety had somewhat higher mean life satisfaction than the control group both before the pandemic and now (23.6 before and 24.9 now). As shown in Table A17, it was found that there were significant differences in life satisfaction between the following groups before the beginning of COVID-19: Suspects no mental illness and suspects 2 mental illnesses, and suspects no mental illness and suspects 3 or more mental illnesses. As shown in Table A18, it was found that there were significant differences now in life satisfaction between the following groups: suspects no mental illness and suspects 2 mental illnesses, suspects none and suspects 3 or more mental illnesses, suspects only anxiety and suspects 2 mental illnesses, and suspects only anxiety and suspects 3 or more mental illnesses.

Overall, mental health conditions were not uncommon in this sample; 13.5% of all participants reported one mental health diagnosis and 33.4% reported 2 or more. Two or more mental health conditions were seen in approximately half of participants diagnosed with ASD only or ASD only, and in 90.9% of those diagnosed with only OCD. All groups, except for the

group diagnosed with only anxiety, had a higher mean life satisfaction now than before the onset of the pandemic. Suspected mental health conditions were also reported and analyzed, and it was found that all groups had a higher life satisfaction now than before the beginning of the pandemic.

### **Scale Scores as Predictors of Life Satisfaction**

Scores on the Autism-Spectrum Quotient (AQ) which quantifies autism symptoms, part A of the Adult ADHD Self-Report Scale (ASRS) which quantifies ADHD symptoms, the Yale-Brown Obsessive Compulsive Scale (Y-BOCS) which quantifies OCD symptoms, were used in a multiple regression analysis to predict scores on the Satisfaction with Life Scale (SWLS) which quantifies life satisfaction. It was found that all 3 scales (ASRS part A, the AQ, and the Y-BOCS) were significantly negatively correlated with life satisfaction now, which means that more symptoms of ADHD, ASD, and OCD are correlated with lower life satisfaction. As shown in Table 4, each of the three predictors had a significant negative impact on current life satisfaction when accounting for all variables at once (Life satisfaction now =  $30.24 + -0.58$  (ASRS) +  $-0.15$  (Y-BOCS) +  $-0.22$  (AQ)), and the AQ had the strongest negative impact on life satisfaction now ( $P < .001$ ). All 3 predictors were found to explain approximately 15% of variance in life satisfaction ( $R^2 = 0.153$ ) according to the regression model summary in Table 5.

Table 4: Coefficients for Life Satisfaction Now and Neurotype Scales

|               | Unstandardized Coefficients |            | Standardized Coefficients Beta | <i>t</i> | <i>p</i> |
|---------------|-----------------------------|------------|--------------------------------|----------|----------|
|               | B                           | Std. Error |                                |          |          |
| (Constant)    | 30.24                       | 1.32       |                                | 22.88    | <.001    |
| ASRS Scores   | -.58                        | .28        | -.13                           | -2.09    | .037     |
| Y-BOCS Scores | -.15                        | .06        | -.15                           | -2.45    | .015     |
| AQ Scores     | -.22                        | .06        | -.22                           | -3.61    | <.001    |

Table 5: Regression Model Summary for Life Satisfaction Now and Neurotype Scales

| R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------------------|----------|-------------------|----------------------------|
| .391 <sup>a</sup> | .153     | .144              | 6.79                       |

<sup>a</sup>Predictors: (Constant), AQ, Y-BOCS, ASRS. <sup>b</sup>Dependent Variable: Life Satisfaction Now



## Discussion

As predicted, higher scores on all three scales (ASRS part A, Y-BOCS, and the AQ) were significantly negatively correlated with current life satisfaction, which suggests that more symptoms of ASD, OCD, and ADHD are correlated with lower life satisfaction. Participants were also given the option to self-report if they were diagnosed with none, ASD, OCD, ADHD, 2 of the neurotypes, or all 3 neurotypes; according to their mean SWLS scores, all of these groups of participants have increased life satisfaction after the onset of the pandemic (except for the group with all 3 neurotypes, the life satisfaction of which remained the same). It was found that those with no neurotype diagnosis had a slightly higher than a neutral level of life satisfaction at both times, and that all neurotype diagnosis groups were in the slightly dissatisfied range of life satisfaction both before the beginning of the pandemic and now (excluding the OCD-only group, which had a slightly higher than neutral level of life satisfaction after the pandemic). In contrast to the hypothesis, the increase in life satisfaction in all neurotype diagnoses suggests that the pandemic may have given young adults in general more opportunities to meet their life satisfaction needs regardless of neurotype diagnosis. These opportunities could include factors such as the increased availabilities of flexible work-from-home jobs, online classes, and telemedicine doctors.

The hypothesis that each neurotype (none, OCD, ADHD, and ASD) would have different levels of life satisfaction was supported. Furthermore, OCD, ADHD, and ASD symptoms each had unique negative impacts on life satisfaction. In this sample of young adults, OCD, ADHD, and ASD symptoms account for approximately 15% of the variation in life satisfaction and the AQ, which quantifies ASD symptoms, had the strongest negative impact on current life satisfaction. As mentioned in the literature review, previous studies have indicated that a lack of

ability to participate in society and a sense of loneliness are the biggest predictors of lower life satisfaction in those with ASD, which is likely why the AQ was so strongly negatively correlated with life satisfaction (Franke et al., 2019; Mazurek, 2014; Schmidt et al., 2015).

Since all neurotypes were correlated with negative life satisfaction and the AQ had the strongest negative impact, this suggests that the life satisfaction needs in young adults with ASD, OCD, and ADHD symptoms are not being met, and that the life satisfaction needs of those with ASD (such as the ability to socialize) are being met the least. The Y-BOCS, which quantifies the amount of time taken up by obsessive and compulsive OCD symptoms, had the second strongest negative impact on life satisfaction. OCD had a strong negative impact on life satisfaction because like autism, it interferes with the ability to socialize and increases feelings of isolation; this is due to the amount of time and energy taken up by thinking about obsessions and fulfilling/resisting compulsions (Remmerswaal et al., 2016; Sørensen et al., 2004). The ASRS, which quantifies ADHD symptoms, had the third strongest negative impact on life satisfaction; its negative impact is likely due to the psychological distress caused by symptoms of inattention (which can affect work and school abilities) and interpersonal difficulties (Hennig et al., 2017; Safren et al., 2009; Shi et al., 2018).

The results of this study were generally in agreement with prior studies; previous studies had found that those with ASD experience significant functional impairments and less life satisfaction in multiple areas (especially in social life satisfaction) which explains why ASD symptoms had the greatest negative effect on life satisfaction when compared to ADHD and OCD (Franke et al., 2019; Mazurek, 2014; Schmidt et al., 2015). However, no prior study has examined the effects of all three neurotypes on life satisfaction, so no comparison can be made when evaluating if it was expected for ASD to have the greatest negative effect on life

satisfaction. In previous studies, social support was found to be a mediating factor in life satisfaction in both those with ASD and ADHD; since ASD symptoms were found to have a greater negative effect on life satisfaction than ADHD symptoms, this may suggest those with ASD are receiving even less social support than those with ADHD (since ADHD was also negatively correlated with life satisfaction) (Hennig et al., 2017; Schmidt et al., 2015). A previous study also found that 17-18% of those with OCD have a mood disorder, and another found that OCD is highly correlated with mood disorders and anxiety, which provide a possible explanation for why 90.5% of participants diagnosed with OCD reported 2 or more mental health diagnoses (Amerio et al., 2015; Osland et al., 2018).

Where this study's results diverge from previous studies is the effects of the COVID-19 pandemic, since it was found that mean life satisfaction in young adults (ages 18-29) has increased since the onset of the COVID-19 pandemic; previous studies had indicated that the pandemic promoted feelings of isolation and decreased life satisfaction, and decreased coping skills in those with ASD, OCD, and ADHD (Baweja et al., 2022; Sibley et al., 2021; Wheaton et al., 2021). It is also important to note that the increase in life satisfaction since the pandemic may be due to social and emotional recovery from the negative effects of the COVID-19 pandemic, since it has begun to affect the lives of young adults less in 2022 than it did in 2020 or 2021. The increase in life satisfaction could also be due to participants misremembering their level of life satisfaction before COVID-19, or due to participants misinterpreting the question.

One limitation of this study is the small sample size of young adults with only OCD (11) and only ASD (6); however, 14 participants were diagnosed with 2 of the neurotypes and 3 participants were diagnosed with all 3, so the true sample size of those diagnosed with ASD and OCD was slightly larger. This smaller population of those with only OCD or only ASD

compared to those with only ADHD (44) is also expected in a young adult population. However, the data collected using the scales to quantify the symptoms of each neurotype also allowed for the analysis of the effects of OCD, ASD, and ADHD symptoms using the entire sample of 324 young adults, which also better accounts for undiagnosed and misdiagnosed participants than the self-reported statistics. This sample may also not be representative of a typical college population; the majority of participants recruited (84.26%) were college students recruited through the University of Tennessee at Chattanooga's psychology department's research system SONA, which means that they have either begun or continued to remain in higher education since the beginning of the COVID-19 pandemic. In addition to the typical stresses of higher education, the stressors of the COVID-19 pandemic may have led to those with the lowest levels of life satisfaction to leave college before March of 2022 when data collection began, so they would not have been recruited to participate in this study. Additionally, the sample of young adults was predominantly female (73.6%), which may not be representative of young adults as a whole. Participants were also only asked what mental health and neurotype diagnoses they had, and not when they were diagnosed, so some participants included in the neurotype diagnoses groups may no longer have significant symptoms of their diagnosis if they were diagnosed in childhood.

Future research should explore why mean life satisfaction in young adults (ages 18-29) of all neurotypes studied has increased since the onset of the COVID-19 pandemic, since previous studies had indicated the pandemic promoted decreased life satisfaction (Baweja et al., 2022; Sibley et al., 2021; Wheaton et al., 2021). Although life satisfaction has increased since the pandemic, 33.4% of all participants reported they have 2 or more mental health conditions, and 13.5% of all participants reported that they have 1 mental health condition; future research

should ask participants open-ended questions about the effects of COVID-19 on their life satisfaction to better understand how life satisfaction increased between pre-pandemic 2020 and 2022 despite high levels of mental illness in a young adult population. If future research also relies on a sample composed of mostly college students, it should take place when current college students are no longer those whose higher education was impacted by the COVID-19 pandemic, since the stressors of the pandemic may have led those with the lowest life satisfaction to leave college before this study occurred in 2022 when they otherwise would have remained enrolled (which may have led to a lower life satisfaction overall in this study's sample than is typical). This would allow researchers to see if the life satisfaction of young adults has returned to its pre-pandemic baseline level.

Additionally, future research should include more participants diagnosed with only ASD and only OCD, and a sample composed more evenly of young adults who are in college and those who are not may be more representative of young adults as a whole. Further research should analyze what specific symptoms of OCD, ADHD, and ASD most negatively impact life satisfaction; this would allow for the identification of what interventions or supports for these conditions would increase life satisfaction the most. Future research should also look into the efficacy of social support as a mediator for life satisfaction in all three neurotypes, since prior studies suggest it is a mediating factor in life satisfaction in those with ASD and ADHD (Hennig et al., 2017; Schmidt et al., 2015). Additional research should also include scales to quantify anxiety and depression to better understand to what degree mental illness negatively impacts life satisfaction. This would also allow for the analysis of any correlation that may exist between OCD and mental health conditions, since 90.5% of participants diagnosed with only the OCD neurotype were diagnosed with 2 or more mental health conditions. Future research should also

ask participants when they were diagnosed with ASD, OCD, or ADHD; this would allow for the exclusion of participants diagnosed in childhood who have very low scores on the scale measuring the neurotype they were diagnosed with. It would also allow researchers to see if many participants were diagnosed with ASD, OCD, or ADHD during the COVID-19 pandemic, since the COVID-19 pandemic may have actually improved access to telehealth doctors (and thus improved access to diagnoses).

Although this study had its limitations, it was the first to compare the life satisfaction of those with OCD, ADHD, and ASD to each other, which is a step forward in furthering our understanding of the impact of neurotypes on life satisfaction. The hypothesis that those with OCD, ASD, and ADHD would each have different levels of life satisfaction was supported, and OCD, ADHD, and ASD symptoms accounted for 15% of life satisfaction in this sample. Moreover, ASD, OCD, and ADHD symptoms each had a unique negative impact on life satisfaction, and ASD symptoms had the strongest negative impact on life satisfaction. Finally, the life satisfaction of all neurotypes has either increased or remained the same since the onset of the COVID-19 pandemic.

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## Appendix

### Comparing Scale Scores by Neurotype Diagnosis

As shown in Table A12 in the appendix, on part A of the ASRS (a higher score on which indicates more ADHD symptoms), the group diagnosed with all 3 neurotypes scored the highest on average (5.3 out of a maximum score of 6) and the group diagnosed with 2 neurotypes scored the second highest (4.8 out of 6). The group diagnosed with ADHD had an average score of 3.8 out of 6, while the group diagnosed with only autism had a slightly higher mean score on the ASRS (4.0 out of 6). The group diagnosed with only OCD scored the second lowest (3.3 out of 6) and the control group (no diagnosis) scored the lowest (2.8 out of 6) on the ASRS. As shown in Table A2 the differences in ASRS scores between the no diagnosis group and the only ADHD group, and the no diagnosis group and 2 neurotype diagnoses group are statistically significant ( $P < .001$ ).

On the AQ, a higher score on which indicates more autism symptoms, the group diagnosed with only autism scored the highest (38 out of a total possible score of 50); this is significantly higher than all other groups. The group diagnosed with 2 neurotypes had the second highest mean of 28.9, the group diagnosed with 3 neurotypes had a mean of 26.7, the group diagnosed with only OCD had a mean of 23.9, the group diagnosed with only ADHD had a mean of 23.4, and the control group with no diagnoses scored a mean of 20.5; this is found in Table A12 in the appendix. As shown in Table A3, the difference in mean AQ score between those with no diagnosis and those diagnosed with only ASD was statistically significant; the difference between those with no diagnosis and those diagnosed with 2 neurotypes was also statistically significant. The difference in mean AQ score was also significant between those with only

ADHD and those with only autism, and between those with only OCD and those with only autism.

On the Y-BOCS, a higher score on which indicates more OCD symptoms, the group only diagnosed with OCD scored the highest (33.0 out of a total possible score of 40), and the group diagnosed with all 3 neurotypes scored only slightly lower (32.6). The group with 2 diagnoses scored a mean of 28.3, the group with only autism scored a mean of 23.9, the group with only ADHD scored a mean of 23.7, and the group with no diagnoses (the control group) had a mean of 21.2; this is all shown in Table A12 in the appendix. As shown in Table A4 in the appendix, the differences in mean Y-BOCS scores between the no diagnosis group and two different groups were statistically significant: the OCD-only group and the 2 diagnoses group. The difference between the only diagnosed with OCD and only diagnosed with ADHD groups was also statistically significant.

**Tables A1-A12**

Table A1: Tukey HSD of Neurotype Diagnoses and Life Satisfaction Now

| (I)<br>Neurotype<br>Diagnosis | (J)<br>Neurotype<br>Diagnosis | Mean Difference<br>(I-J) | SE    | <i>p</i> |
|-------------------------------|-------------------------------|--------------------------|-------|----------|
| No diagnosis                  | ADHD                          | 4.530                    | 1.170 | <.001    |
|                               | OCD                           | 1.644                    | 2.191 | .454     |
|                               | ASD                           | 3.962                    | 2.935 | .178     |
|                               | 2 diagnoses                   | .462                     | 1.954 | .813     |
|                               | 3 diagnoses                   | 10.796                   | 4.124 | .009     |
| ADHD                          | No diagnosis                  | -4.530                   | 1.170 | <.001    |
|                               | OCD                           | -2.886                   | 2.392 | .228     |
|                               | ASD                           | -.568                    | 3.088 | .854     |
|                               | 2 diagnoses                   | -4.068                   | 2.177 | .063     |
|                               | 3 diagnoses                   | 6.265                    | 4.234 | .140     |
| OCD                           | No diagnosis                  | -1.644                   | 2.191 | .454     |
|                               | ADHD                          | 2.886                    | 2.392 | .228     |
|                               | ASD                           | 2.318                    | 3.601 | .520     |
|                               | 2 diagnoses                   | -1.182                   | 2.859 | .680     |
|                               | 3 diagnoses                   | 9.152                    | 4.622 | .049     |
| ASD                           | No diagnosis                  | -3.962                   | 2.935 | .178     |
|                               | ADHD                          | .568                     | 3.088 | .854     |
|                               | OCD                           | -2.318                   | 3.601 | .520     |
|                               | 2 diagnoses                   | -3.500                   | 3.462 | .313     |
|                               | 3 diagnoses                   | 6.833                    | 5.017 | .174     |



|             |              |         |       |      |
|-------------|--------------|---------|-------|------|
| 2 diagnoses | No diagnosis | -.462   | 1.954 | .813 |
|             | ADHD         | 4.068   | 2.177 | .063 |
|             | OCD          | 1.182   | 2.859 | .680 |
|             | ASD          | 3.500   | 3.462 | .313 |
|             | 3 diagnoses  | 10.333  | 4.514 | .023 |
| 3 diagnoses | No diagnosis | -10.796 | 4.124 | .009 |
|             | ADHD         | -6.265  | 4.234 | .140 |
|             | OCD          | -9.152  | 4.622 | .049 |
|             | ASD          | -6.833  | 5.017 | .174 |
|             | 2 diagnoses  | -10.333 | 4.514 | .023 |

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Table A2: Tukey HSD of ASRS Scores and Neurotype Diagnoses

| Dependent Variable | (I) Neurotype Diagnosis | (J) Neurotype Diagnosis | Mean Difference | SE    | <i>p</i> |
|--------------------|-------------------------|-------------------------|-----------------|-------|----------|
| ASRS Scores        | No diagnosis            | ADHD                    | -.936           | .261  | .005     |
|                    |                         | OCD                     | -.492           | .474  | .905     |
|                    |                         | ASD                     | -1.159          | .614  | .413     |
|                    |                         | 2 diagnoses             | -2.005          | .456  | <.001    |
|                    |                         | 3 diagnoses             | -2.492          | .930  | .082     |
|                    | ADHD                    | No diagnosis            | .936            | .261  | .005     |
|                    |                         | OCD                     | .444            | .520  | .957     |
|                    |                         | ASD                     | -.222           | .650  | .999     |
|                    |                         | 2 diagnoses             | -1.068          | .504  | .280     |
|                    |                         | 3 diagnoses             | -2.000          | 1.033 | .382     |
|                    | OCD                     | No diagnosis            | .492            | .474  | .905     |
|                    |                         | ADHD                    | -.444           | .520  | .957     |
|                    |                         | ASD                     | -.667           | .761  | .952     |
|                    |                         | 2 diagnoses             | -1.513          | .640  | .174     |
|                    |                         | 3 diagnoses             | -2.000          | 1.033 | .382     |
|                    | ASD                     | No diagnosis            | 1.159           | .614  | .413     |
|                    |                         | ADHD                    | .222            | .650  | .999     |
|                    |                         | OCD                     | .667            | .761  | .952     |
|                    |                         | 2 diagnoses             | -.846           | .750  | .870     |
|                    |                         | 3 diagnoses             | -1.333          | 1.105 | .833     |
| 2 diagnoses        | No diagnosis            | 2.005*                  | .456            | <.001 |          |
|                    | ADHD                    | 1.068                   | .504            | .280  |          |

|             |              |       |       |      |
|-------------|--------------|-------|-------|------|
|             | OCD          | 1.51  | .641  | .174 |
|             | ASD          | .846  | .750  | .870 |
|             | 3 diagnoses  | -.487 | 1.025 | .997 |
| 3 diagnoses | No diagnosis | 2.492 | .930  | .082 |
|             | ADHD         | 1.556 | .954  | .579 |
|             | OCD          | 2.000 | 1.033 | .382 |
|             | ASD          | 1.333 | 1.105 | .833 |
|             | 2 diagnoses  | .487  | 1.025 | .997 |

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Table A3: Tukey HSD of AQ Scores and Neurotype Diagnoses

| Dependent Variable | (I) Neurotype Diagnosis | (J) Neurotype Diagnosis | Mean Difference | SE    | <i>p</i> |
|--------------------|-------------------------|-------------------------|-----------------|-------|----------|
| AQ Scores          | No diagnosis            | ADHD                    | -2.925          | 1.136 | .107     |
|                    |                         | OCD                     | -3.410          | 2.043 | .553     |
|                    |                         | ASD                     | -17.493         | 2.647 | <.001    |
|                    |                         | 2 diagnoses             | -8.279          | 1.900 | <.001    |
|                    |                         | 3 diagnoses             | -6.160          | 4.009 | .641     |
|                    | ADHD                    | No diagnosis            | 2.925           | 1.136 | .107     |
|                    |                         | OCD                     | -.485           | 2.247 | 1.000    |
|                    |                         | ASD                     | -14.568         | 2.807 | <.001    |
|                    |                         | 2 diagnoses             | -5.354          | 2.117 | .119     |
|                    |                         | 3 diagnoses             | -3.235          | 4.116 | .970     |
|                    | OCD                     | No diagnosis            | 3.410           | 2.043 | .553     |
|                    |                         | ADHD                    | .485            | 2.247 | 1.000    |
|                    |                         | ASD                     | -14.083         | 3.281 | <.001    |
|                    |                         | 2 diagnoses             | -4.869          | 2.714 | .471     |
|                    |                         | 3 diagnoses             | -2.750          | 4.453 | .990     |
|                    | ASD                     | No diagnosis            | 17.493          | 2.647 | <.001    |
|                    |                         | ADHD                    | 14.568          | 2.807 | <.001    |
|                    |                         | OCD                     | 14.083          | 3.281 | <.001    |
|                    |                         | 2 diagnoses             | 9.214           | 3.193 | .048     |
|                    |                         | 3 diagnoses             | 11.333          | 4.760 | .166     |
| 2 diagnoses        | No diagnosis            | 8.279                   | 1.900           | <.001 |          |
|                    | ADHD                    | 5.354                   | 2.117           | .119  |          |

|             |              |         |       |      |
|-------------|--------------|---------|-------|------|
|             | OCD          | 4.869   | 2.714 | .471 |
|             | ASD          | -9.214  | 3.193 | .048 |
|             | 3 diagnoses  | 2.119   | 4.389 | .997 |
| 3 diagnoses | No diagnosis | 6.160   | 4.009 | .641 |
|             | ADHD         | 3.235   | 4.116 | .970 |
|             | OCD          | 2.750   | 4.453 | .990 |
|             | ASD          | -11.333 | 4.760 | .166 |
|             | 2 diagnoses  | -2.119  | 4.389 | .997 |

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Table A4: Tukey HSD of Y-BOCS Scores and Neurotype Diagnoses

| Dependent Variable | (I) Neurotype Diagnosis | (J) Neurotype Diagnosis | Mean Difference | SE    | <i>p</i> |
|--------------------|-------------------------|-------------------------|-----------------|-------|----------|
| Y-BOCS Scores      | No diagnosis            | ADHD                    | -2.488          | 1.108 | .220     |
|                    |                         | OCD                     | -11.838         | 2.009 | <.001    |
|                    |                         | ASD                     | -2.612          | 2.603 | .917     |
|                    |                         | 2 diagnoses             | -7.088          | 1.809 | .002     |
|                    |                         | 3 diagnoses             | -11.421         | 3.941 | .046     |
|                    | ADHD                    | No diagnosis            | 2.488           | 1.108 | .220     |
|                    |                         | OCD                     | -9.350          | 2.203 | <.001    |
|                    |                         | ASD                     | -.124           | 2.755 | 1.000    |
|                    |                         | 2 diagnoses             | -4.600          | 2.022 | .208     |
|                    |                         | 3 diagnoses             | -8.933          | 4.044 | .237     |
|                    | OCD                     | No diagnosis            | 11.838          | 2.009 | <.001    |
|                    |                         | ADHD                    | 9.350           | 2.203 | <.001    |
|                    |                         | ASD                     | 9.226           | 3.225 | .051     |
|                    |                         | 2 diagnoses             | 4.750           | 2.626 | .462     |
|                    |                         | 3 diagnoses             | .417            | 4.377 | 1.00     |
|                    | ASD                     | No diagnosis            | 2.612           | 2.603 | .917     |
|                    |                         | ADHD                    | .124            | 2.755 | 1.000    |
|                    |                         | OCD                     | -9.226          | 3.225 | .051     |
|                    |                         | 2 diagnoses             | -4.476          | 3.104 | .701     |
|                    |                         | 3 diagnoses             | -8.810          | 4.680 | .415     |
| 2 diagnoses        | No diagnosis            | 7.088                   | 1.809           | .002  |          |

|             |              |        |       |       |
|-------------|--------------|--------|-------|-------|
|             | ADHD         | 4.600  | 2.022 | .208  |
|             | OCD          | -4.750 | 2.626 | .462  |
|             | ASD          | 4.476  | 3.104 | .701  |
|             | 3 diagnoses  | -4.333 | 4.289 | .914  |
| 3 diagnoses | No diagnosis | 11.421 | 3.941 | .046  |
|             | ADHD         | 8.933  | 4.044 | .237  |
|             | OCD          | -.417  | 4.377 | 1.000 |
|             | ASD          | 8.810  | 4.680 | .415  |
|             | 2 diagnoses  | 4.333  | 4.290 | .914  |

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Table A5: ANOVA between ASRS, AQ, Y-BOCS, and Neurotype Diagnosis

| Variable      |                | Sum of Squares | df  | Mean Square | <i>F</i> | <i>p</i> |
|---------------|----------------|----------------|-----|-------------|----------|----------|
| ASRS Scores   | Between Groups | 96.430         | 5   | 19.286      | 7.528    | <.001    |
|               | Within Groups  | 771.094        | 301 | 2.562       |          |          |
|               | Total          | 867.524        | 306 |             |          |          |
| AQ Scores     | Between Groups | 3139.188       | 5   | 627.838     | 13.194   | <.001    |
|               | Within Groups  | 14323.476      | 301 | 47.586      |          |          |
|               | Total          | 17462.664      | 306 |             |          |          |
| Y-BOCS Scores | Between Groups | 2595.682       | 5   | 519.136     | 11.289   | <.001    |
|               | Within Groups  | 13796.069      | 300 | 45.987      |          |          |
|               | Total          | 16391.752      | 305 |             |          |          |



Table A6: Suspected Neurotype and Life Satisfaction (before COVID and now)

| Suspected Neurotype  | Mean Life Satisfaction Now | Standard Deviation Now | Mean Life Satisfaction Before COVID | Standard Deviation Before COVID |
|----------------------|----------------------------|------------------------|-------------------------------------|---------------------------------|
| Suspects none        | 22.23                      | 6.94                   | 21.33                               | 7.85                            |
| Suspects ADHD        | 21.38                      | 7.53                   | 20.40                               | 8.36                            |
| Suspects OCD         | 23.88                      | 7.91                   | 22.04                               | 8.28                            |
| Suspects Autism      | 15.89                      | 6.17                   | 14.56                               | 5.12                            |
| Suspects 2 diagnoses | 20.41                      | 7.17                   | 18.24                               | 7.61                            |
| Suspects 3 diagnoses | 16.90                      | 6.73                   | 14.64                               | 6.15                            |
| Total                | 21.57                      | 7.28                   | 20.36                               | 8.02                            |

Table A7: ANOVA between Suspected Neurotype and Life Satisfaction (before and after COVID)

| Source  | Measure                          | Type III Sum of Squares | DF | <i>F</i> | <i>p</i> | Partial Eta Squared |
|---|----------------------------------|-------------------------|----|----------|----------|---------------------|
| Life Satisfaction Before COVID and Life Satisfaction Now (Time) * Suspected Neurotype | Greenhouse-Geisser               | 35.44                   | 5  | .376     | .865     | .006                |
| Life Satisfaction Before COVID and Life Satisfaction Now (Time)                       | Greenhouse-Geisser               | 153.49                  | 1  | 8.13     | .005     | .027                |
| Suspected Neurotype   | Test of Between-Subjects Effects | 1760.725                | 5  | 3.73     | .003     | .061                |

Table A8: Mental Health Diagnosis and Life Satisfaction (before and after COVID)

| Scale                          | Mental Health Diagnosis | Mean  | Standard Deviation |
|--------------------------------|-------------------------|-------|--------------------|
| Life Satisfaction Now          | None                    | 23.26 | 6.95               |
|                                | Anxiety                 | 22.64 | 6.82               |
|                                | Depression              | 20.08 | 8.99               |
|                                | Other mental illness    | 26.00 | 4.69               |
|                                | 2 diagnoses             | 19.56 | 7.00               |
|                                | 3 or more diagnoses     | 18.42 | 7.54               |
|                                | Total                   | 21.63 | 7.29               |
| Life Satisfaction before COVID | None                    | 22.78 | 7.84               |
|                                | Anxiety                 | 22.81 | 7.40               |
|                                | Depression              | 15.00 | 7.77               |
|                                | Other mental illness    | 25.00 | 5.16               |
|                                | 2 diagnoses             | 18.00 | 7.29               |
|                                | 3 or more diagnoses     | 15.82 | 7.09               |
|                                | Total                   | 20.54 | 8.03               |

Table A9: ANOVA between Mental Health Diagnosis and Life Satisfaction (before and after COVID)

| Source  | Partial Eta Squared | Type III Sum of Squares | DF | <i>F</i> | <i>p</i> |
|---|---------------------|-------------------------|----|----------|----------|
| Life Satisfaction Before COVID and Life Satisfaction Now (Time)                           | .024                | 135.785                 | 2  | 7.598    | .006     |
| Mental Health Diagnosis   | .117                | 3666.789                | 5  | 8.227    | <.001    |
| Life Satisfaction Before COVID and Life Satisfaction Now (Time) * Mental Health Diagnosis | .035                | 199.314                 | 10 | 2.230    | .051     |

Table A10: Suspected Mental Health Disorder and Life Satisfaction (before and after COVID)

| Scale                          | Mental Health Diagnosis       | Mean  | Standard Deviation |
|--------------------------------|-------------------------------|-------|--------------------|
| Life Satisfaction Now          | Suspects none                 | 23.50 | 6.66               |
|                                | Suspects anxiety              | 24.94 | 5.90               |
|                                | Suspects depression           | 20.83 | 7.17               |
|                                | Suspects other mental illness | 17.00 | 6.43               |
|                                | Suspects 2 diagnoses          | 19.08 | 7.28               |
|                                | Suspects 3 or more diagnoses  | 16.90 | 7.24               |
|                                | Total                         |       | 21.63              |
| Life Satisfaction before COVID | None                          | 22.65 | 7.86               |
|                                | Suspects anxiety              | 23.63 | 6.75               |
|                                | Suspects depression           | 17.42 | 9.20               |
|                                | Suspects other mental illness | 16.86 | 8.51               |
|                                | Suspects 2 diagnoses          | 18.03 | 7.78               |
|                                | Suspects 3 or more diagnoses  | 16.00 | 6.58               |
|                                | Total                         |       | 20.54              |

Table A11: ANOVA between Suspected Mental Health Disorder and Life Satisfaction (before and after COVID)

| Source  | Partial<br>Eta<br>Squared | Type III Sum<br>of Squares | DF | <i>F</i>   | <i>p</i> |
|---|---------------------------|----------------------------|----|------------|----------|
| Life Satisfaction<br>Before COVID and<br>Life Satisfaction Now<br>(Time)  | .017                      | 99.225                     | 2  | 5.39<br>7  | .021     |
| Suspected Mental<br>Health Disorder   | .159                      | 4949.626                   | 5  | 11.6<br>47 | <.001    |
| Life Satisfaction<br>Before COVID and<br>Life Satisfaction Now<br>(Time) * Suspected<br>Mental Health<br>Disorder | .007                      | 40.898                     | 10 | .445       | .817     |

Table A12: Y-BOCS, ASRS, and AQ Mean Scores by Neurotype Diagnosis

| Scale  | Neurotype Diagnosis | Mean Score |
|--------|---------------------|------------|
| ASRS   | No diagnosis        | 2.841      |
|        | ADHD                | 3.778      |
|        | OCD                 | 3.333      |
|        | ASD                 | 4.000      |
|        | 2 diagnoses         | 4.846      |
|        | 3 diagnoses         | 5.333      |
| AQ     | No diagnosis        | 20.507     |
|        | ADHD                | 23.432     |
|        | OCD                 | 23.917     |
|        | ASD                 | 38.000     |
|        | 2 diagnoses         | 28.786     |
|        | 3 diagnoses         | 26.667     |
| Y-BOCS | No diagnosis        | 21.246     |
|        | ADHD                | 23.733     |
|        | OCD                 | 33.083     |
|        | ASD                 | 23.857     |
|        | 2 diagnoses         | 28.333     |
|        | 3 diagnoses         | 32.667     |

Table A13: Tukey HSD of Neurotype Diagnoses and Life Satisfaction Pre-COVID

| (I)<br>Neurotype<br>Diagnosis | (J)<br>Neurotype<br>Diagnosis | Mean<br>Difference | SE    | <i>p</i> |
|-------------------------------|-------------------------------|--------------------|-------|----------|
| No diagnosis                  | ADHD                          | 4.830              | 1.278 | .003     |
|                               | OCD                           | 3.853              | 2.391 | .592     |
|                               | ASD                           | 6.005              | 3.202 | .420     |
|                               | 2 diagnoses                   | 5.029              | 2.133 | .175     |
|                               | 3 diagnoses                   | 10.005             | 4.498 | .230     |
| ADHD                          | No diagnosis                  | -4.830             | 1.278 | .003     |
|                               | OCD                           | -.977              | 2.609 | .999     |
|                               | ASD                           | 1.174              | 3.368 | .999     |
|                               | 2 diagnoses                   | .198               | 2.374 | 1.000    |
|                               | 3 diagnoses                   | 5.174              | 4.617 | .873     |
| OCD                           | No diagnosis                  | -3.853             | 2.391 | .592     |
|                               | ADHD                          | .977               | 2.609 | .999     |
|                               | ASD                           | 2.152              | 3.927 | .994     |
|                               | 2 diagnoses                   | 1.175              | 3.118 | .999     |
|                               | 3 diagnoses                   | 6.152              | 5.040 | .827     |
| ASD                           | No diagnosis                  | -6.005             | 3.202 | .420     |
|                               | ADHD                          | -1.174             | 3.368 | .999     |
|                               | OCD                           | -2.152             | 3.927 | .994     |
|                               | 2 diagnoses                   | -.976              | 3.776 | 1.000    |
|                               | 3 diagnoses                   | 4.000              | 5.472 | .978     |
| 2 diagnoses                   | No diagnosis                  | -5.028             | 2.133 | .175     |
|                               | ADHD                          | -.1981             | 2.374 | 1.000    |



|             |              |         |       |       |
|-------------|--------------|---------|-------|-------|
|             | OCD          | -1.175  | 3.118 | .999  |
|             | ASD          | .976    | 3.776 | 1.000 |
|             | 3 diagnoses  | 4.976   | 4.923 | .914  |
| 3 diagnoses | No diagnosis | -10.005 | 4.498 | .230  |
|             | ADHD         | -5.174  | 4.617 | .873  |
|             | OCD          | -6.152  | 5.040 | .827  |
|             | ASD          | -4.000  | 5.472 | .978  |
|             | 2 diagnoses  | -4.976  | 4.923 | .914  |

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Table A14: Pairwise Comparisons of Life Satisfaction (before COVID and now) and Neurotype Diagnoses

| Neurotype Diagnosis | Mean Difference (I-J) | SE    | <i>p</i> |
|---------------------|-----------------------|-------|----------|
| No Diagnosis        | .849                  | .411  | .040     |
| ADHD                | 1.091                 | .915  | .234     |
| OCD                 | 3.000                 | 1.831 | .102     |
| ASD                 | 2.833                 | 2.479 | .254     |
| 2 diagnoses         | 5.357                 | 1.623 | .001     |
| 3 diagnoses         | 1.457E-13             | 3.506 | 1.000    |

\*I: Now \*J: Pre-COVID

Table A15: Tukey HSD of Mental Health Diagnoses and Life Satisfaction Pre-COVID Pandemic

| (I)<br>Mental<br>Health<br>Diagnosis | (J)<br>Mental<br>Health<br>Diagnosis | Mean<br>Difference | SE    | <i>p</i> |
|--------------------------------------|--------------------------------------|--------------------|-------|----------|
| No diagnosis                         | Anxiety                              | .448               | 1.484 | 1.000    |
|                                      | Depression                           | 10.229             | 2.575 | .001     |
|                                      | Other mental<br>illness              | -2.326             | 3.798 | .990     |
|                                      | 2 diagnoses                          | 5.058              | 1.053 | <.001    |
|                                      | 3 or more<br>diagnoses               | 6.383              | 1.484 | <.001    |
| Anxiety                              | No diagnosis                         | -.448              | 1.484 | 1.000    |
|                                      | Depression                           | 9.781              | 2.837 | .008     |
|                                      | Other mental<br>illness              | -2.774             | 3.981 | .982     |
|                                      | 2 diagnoses                          | 4.610              | 1.591 | .046     |
|                                      | 3 or more<br>diagnoses               | 5.936              | 1.903 | .024     |
| Depression                           | No diagnosis                         | -10.229            | 2.575 | .001     |
|                                      | Anxiety                              | -9.781             | 2.837 | .008     |
|                                      | Other mental<br>illness              | -12.556            | 3.798 | .062     |
|                                      | 2 diagnoses                          | -5.171             | 3.981 | .368     |
|                                      | 3 or more<br>diagnoses               | -3.846             | 4.503 | .753     |
| Other Mental<br>Illness              | No diagnosis                         | 2.326              | 3.842 | .990     |
|                                      | Anxiety                              | 2.774              | 3.981 | .982     |

|                     |                      |        |       |       |
|---------------------|----------------------|--------|-------|-------|
|                     | Depression           | 12.556 | 1.053 | .062  |
|                     | 2 diagnoses          | 7.385  | 1.591 | .391  |
|                     | 3 or more diagnoses  | 8.710  | 2.638 | .247  |
| 2 diagnoses         | No diagnosis         | -5.059 | 3.842 | <.001 |
|                     | Anxiety              | -4.610 | 1.591 | .046  |
|                     | Depression           | 5.171  | 2.638 | .368  |
|                     | Other mental illness | -7.385 | 3.842 | .391  |
|                     | 3 or more diagnoses  | 1.325  | 1.591 | .961  |
| 3 or more diagnoses | No diagnosis         | -6.383 | 1.484 | <.001 |
|                     | Anxiety              | -5.936 | 1.903 | .024  |
|                     | Depression           | 3.846  | 2.837 | .753  |
|                     | Other mental illness | -8.710 | 3.981 | .247  |
|                     | 2 diagnoses          | -1.325 | 1.591 | .961  |

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Table A16: Tukey HSD of Mental Health Diagnoses and Life Satisfaction Now

| (I)<br>Neurotype<br>Diagnosis | (J)<br>Neurotype<br>Diagnosis | Mean<br>Difference | SE    | <i>p</i> |
|-------------------------------|-------------------------------|--------------------|-------|----------|
| No diagnosis                  | Anxiety                       | .936               | 1.404 | .985     |
|                               | Depression                    | 4.255              | 2.443 | .505     |
|                               | Other mental<br>illness       | -2.967             | 3.606 | .963     |
|                               | 2 diagnoses                   | 3.475              | .997  | .007     |
|                               | 3 or more<br>diagnoses        | 4.194              | 1.404 | .036     |
| Anxiety                       | No diagnosis                  | -.936              | 1.404 | .985     |
|                               | Depression                    | 3.319              | 2.695 | .821     |
|                               | Other mental<br>illness       | -3.903             | 3.782 | .907     |
|                               | 2 diagnoses                   | 2.538              | 1.514 | .549     |
|                               | 3 or more<br>diagnoses        | 3.258              | 1.808 | .466     |
| Depression                    | No diagnosis                  | -4.255             | 2.443 | .505     |
|                               | Anxiety                       | -3.319             | 2.695 | .821     |
|                               | Other mental<br>illness       | -7.222             | 4.278 | .541     |
|                               | 2 diagnoses                   | -.781              | 2.508 | 1.000    |
|                               | 3 or more<br>diagnoses        | -.061              | 2.695 | 1.000    |
| Other Mental<br>Illness       | No diagnosis                  | 2.967              | 3.606 | .963     |
|                               | Anxiety                       | 3.903              | 3.782 | .907     |
|                               | Depression                    | 7.222              | 4.278 | .541     |

|                     |                      |        |       |       |
|---------------------|----------------------|--------|-------|-------|
|                     | 2 diagnoses          | 6.442  | 3.651 | .490  |
|                     | 3 or more diagnoses  | 7.161  | 3.782 | .408  |
| 2 diagnoses         | No diagnosis         | -3.475 | .997  | .007  |
|                     | Anxiety              | -2.538 | 1.514 | .549  |
|                     | Depression           | .781   | 2.508 | 1.000 |
|                     | Other mental illness | -6.442 | 3.651 | .490  |
|                     | 3 or more diagnoses  | .720   | 1.514 | .997  |
| 3 or more diagnoses | No diagnosis         | -4.194 | 1.404 | .036  |
|                     | Anxiety              | -3.258 | 1.808 | .466  |
|                     | Depression           | .061   | 2.695 | 1.000 |
|                     | Other mental illness | -7.161 | 3.782 | .408  |
|                     | 2 diagnoses          | -.720  | 1.514 | .997  |

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Table A17: Tukey HSD of Suspected Mental Health Condition and Life Satisfaction Pre-COVID  
Pandemic

| (I)<br>Suspected<br>Mental<br>Illness | (J)<br>Suspected<br>Mental<br>Illness | Mean<br>Difference | SE    | <i>p</i> |
|---------------------------------------|---------------------------------------|--------------------|-------|----------|
| Suspects<br>None                      | Anxiety                               | -.946              | 1.233 | .973     |
|                                       | Depression                            | 5.054              | 2.312 | .248     |
|                                       | Other mental<br>illness               | 3.637              | 3.183 | .863     |
|                                       | Suspects 2                            | 4.785              | 1.100 | <.001    |
|                                       | Suspects 3 or<br>more                 | 6.328              | 1.616 | .002     |
| Anxiety                               | Suspects<br>none                      | .946               | 1.233 | .973     |
|                                       | Depression                            | 6.000              | 2.396 | .126     |
|                                       | Other mental<br>illness               | 4.583              | 3.244 | .719     |
|                                       | Suspects 2                            | 5.731              | 1.266 | <.001    |
|                                       | Suspects 3 or<br>more                 | 7.274              | 1.734 | <.001    |
| Depression                            | Suspects<br>none                      | -5.054             | 2.312 | .248     |
|                                       | Anxiety                               | -6.000             | 2.396 | .126     |
|                                       | Other mental<br>illness               | -1.417             | 3.788 | .999     |
|                                       | Suspects 2                            | -.269              | 2.330 | 1.000    |
|                                       | Suspects 3 or<br>more                 | 1.274              | 2.614 | .997     |

|                         |                         |        |       |       |
|-------------------------|-------------------------|--------|-------|-------|
| Other Mental<br>Illness | Suspects<br>None        | -3.638 | 3.183 | .863  |
|                         | Anxiety                 | -4.583 | 3.244 | .719  |
|                         | Depression              | 1.417  | 3.788 | .999  |
|                         | Suspects 2              | 1.148  | 3.195 | .999  |
|                         | Suspects 3 or<br>more   | 2.691  | 3.408 | .969  |
| Suspects 2              | Suspects<br>None        | -4.785 | 1.099 | <.001 |
|                         | Anxiety                 | -5.731 | 1.266 | <.001 |
|                         | Depression              | .269   | 2.330 | 1.000 |
|                         | Other mental<br>illness | -1.148 | 3.196 | .999  |
|                         | Suspects 3 or<br>more   | 1.543  | 1.642 | .936  |
| Suspects 3 or<br>more   | Suspects<br>None        | -6.328 | 1.616 | .002  |
|                         | Anxiety                 | -7.274 | 1.734 | <.001 |
|                         | Depression              | -1.274 | 2.614 | .997  |
|                         | Other mental<br>illness | -2.691 | 3.402 | .969  |
|                         | Suspects 2              | -1.543 | 1.642 | .936  |

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Table A18: Tukey HSD of Suspected Mental Health Condition and Life Satisfaction Now

| (I)<br>Suspected<br>Mental<br>Illness | (J)<br>Suspected<br>Mental<br>Illness | Mean<br>Difference | SE    | <i>p</i> |
|---------------------------------------|---------------------------------------|--------------------|-------|----------|
| Suspects<br>None                      | Anxiety                               | -1.789             | 1.095 | .578     |
|                                       | Depression                            | 2.296              | 2.081 | .880     |
|                                       | Other mental<br>illness               | 5.130              | 2.869 | .475     |
|                                       | Suspects 2                            | 4.118              | .982  | <.001    |
|                                       | Suspects 3 or<br>more                 | 6.094              | 1.450 | <.001    |
| Anxiety                               | Suspects<br>none                      | 1.789              | 1.095 | .578     |
|                                       | Depression                            | 4.085              | 2.160 | .410     |
|                                       | Other mental<br>illness               | 6.918              | 2.926 | .172     |
|                                       | Suspects 2                            | 5.907              | 1.139 | <.001    |
|                                       | Suspects 3 or<br>more                 | 7.882              | 1.561 | <.001    |
| Depression                            | Suspects<br>none                      | -2.296             | 2.081 | .880     |
|                                       | Anxiety                               | -4.085             | 2.160 | .410     |
|                                       | Other mental<br>illness               | 2.833              | 3.420 | .962     |
|                                       | Suspects 2                            | 1.822              | 2.105 | .954     |
|                                       | Suspects 3 or<br>more                 | 3.798              | 2.360 | .593     |
| Other Mental<br>Illness               | Suspects<br>None                      | -5.130             | 2.869 | .475     |

|                    |                      |        |        |       |
|--------------------|----------------------|--------|--------|-------|
|                    | Anxiety              | -6.918 | 2.926  | .172  |
|                    | Depression           | -2.833 | 3.420  | .962  |
|                    | Suspects 2           | -1.011 | 2.886  | .999  |
|                    | Suspects 3 or more   | .964   | 3.077  | 1.000 |
| Suspects 2         | Suspects None        | -4.118 | .982   | <.001 |
|                    | Anxiety              | -5.907 | 1.139  | <.001 |
|                    | Depression           | -1.822 | 2.105  | .954  |
|                    | Other mental illness | 1.011  | 2.886  | .999  |
|                    | Suspects 3 or more   | 1.976  | 1.484  | .767  |
| Suspects 3 or more | Suspects None        | -6.094 | 1.450  | <.001 |
|                    | Anxiety              | -7.882 | 1.561  | <.001 |
|                    | Depression           | -3.798 | 2.360  | .593  |
|                    | Other mental illness | -.964  | 3.077. | 1.000 |
|                    | Suspects 2           | -1.975 | 1.484  | .767  |

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