Linking Sensory Integration and Processing With Mental Health in Autism: A Retrospective Review of Survey Data

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Importance: Although a central tenet of occupational therapy practice, evidence-based practice is at times overrepresented by research and can overlook the contributions of clinical expertise, the lived experience, and context. This survey affords the occupational therapy practitioner the opportunity to understand sensory integration and processing (SI/P) as experienced by autistic adults.

Objective: To explore the following research question through a retrospective analysis of an internet-based survey: What is the relationship between the SI/P differences and mental health concerns reported by autistic adults?

Design: Nonexperimental; retrospective analysis of data collected from September 2018 through June 2019. The analysis team joined the project after the survey had been launched.

Setting: The Grand Sensory Survey (GSS) was available internationally through the websites and social media accounts of the Autistic Empire and STAR Institute for Sensory Processing.

Participants: The sample included 440 total responses. Excluding responses from participants ages ≤18 yr ($n = 24$), 416 responses were included: $n = 189$ identified as autistic, $n = 147$ identified as nonautistic, and $n = 80$ did not provide a response to this query.

Outcomes and Measures: The GSS included questions about demographics, mental health, and sensory experiences.

Results: Both SI/P disruptions and sensory sensitivity predicted anxiety and depression ($p < .001$).

Conclusions and Relevance: Differences in SI/P are significant factors in mental health for autistic adults.

What This Article Adds: We implicate multiple aspects of SI/P and their influence on mental health among autistic adults. The autistic-led design of the survey ensures representation of issues that are pivotal to the autistic community, broadening the template for aspects of SI/P that should be considered when looking at client factors in autism and influence on function and participation.

Positionality Statement: The authors deliberately use identity first language in keeping with requests from the autistic community (see https://autisticadvocacy.org/about-asan/identity-first-language/). This language is favored by autistic communities and self-advocates and has been adopted by health care professionals and researchers (Bottema-Beutel et al., 2021; Kenny et al., 2016). This article is written from the perspective of the social model of disability and a neurodiversity affirming frame of reference. Three of the five authors are autistic.

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The term *sensory integration and processing* (SI/P) refers to a complex network of client factors that support the human ability to use what we sense to make meaning of the world and our place in it. These factors have the potential to support or impede participation and function across occupations and environments. Although challenges with SI/P are not universally recognized as a stand-alone diagnostic

category, they are widely recognized as contributors to human development and function–dysfunction by pediatricians (Yogman et al., 2018), psychiatrists (Galiana-Simal et al., 2020; van den Boogert et al., 2022), educators (Desautels, 2021), neuroscientists (Shaw et al., 2020), and psychologists and neuropsychologists (Delahooke, 2021), to name a few. *SI/P* is used in this article to refer to the dynamic neurophysiological mechanics underlying a person's capacity to receive, process, and use sensory information or, as Ayres (1972) termed it, the *integrative process. SI/P differences* denote person-to-person variability in SI/P; we all process and integrate sensation differently, and these differences do not always indicate disorder or dysfunction. We recognize that rigid and inhospitable environments, attitudes, and laws and policies can contribute to experiences of ill health, disorder, and disability. Thus, not all experiences of dysfunction are due solely, or even predominantly, to the individual differences of the person experiencing thwarted participation and functioning.

Our perception of the world is an act of interpretation. Anil Seth (Raz, 2018) defined *perception* as informed guesswork constructed by the brain when it encounters sensory data. The brain- and body-based registration, cataloguing, prioritization, modulation, synthesis, response planning, and response execution related to sensory data are termed SI/P. Sensation underpins human function in almost every domain, and SI/P is a critical body function (American Occupational Therapy Association, 2020) for activation of human safety mechanisms, establishing attachment, body ownership, memory formation, social connection, planned action, learning, prediction, thought development, emotional responsivity, sense of self, function, participation, and more (Ayres, 1972; Boldsen, 2022; Kilroy et al., 2019; Mason & McCulloch, 2020). SI/P systems include the mechanisms for sensory modulation, sensory discrimination, aspects of postural control, purposeful skilled movement, behavioral actions, and components of emotional regulation. Resonant with a strengths-based perspective, differences in SI/P are foundational to gymnastic, ice skating, and dance prowess; highly detailed visual memory and illustration; the refined and highly discerning palate; perfect pitch; and so forth (Bidelman & Krishnan, 2009; Bringoux et al., 2000; Li et al., 2009; Muaidi et al., 2009; Paillard et al., 2006; Vogt & Magnussen, 2007).

Among autistic populations, differences in SI/P are extensive. In the Swedish twin study, Taylor et al. (2017) examined the history of 12,419 twin pairs and found that sensory over- and underresponsivity were strongly associated with autism at both the genotype and phenotype levels. Moreover, many notable scholars in the autism and human development fields have suggested that differences in sensory processing and sensory–motor control may be fundamental aspects of autistic developmental processes and function (Bizzell et al., 2018; Boldsen, 2022; Donnellan et al., 2013; Hannant et al., 2016; Hilton et al., 2012; Mosconi & Sweeney, 2015; Robertson & Baron-Cohen, 2017; Whyatt & Craig, 2013). In addition, divergences in SI/P in autism are increasingly associated with co-occurring mental health differences such as anxiety, disrupted attentional modulation, differences in social cognition, externalizing behaviors, and emotional dysregulation (Baker et al., 2008; Green & Ben-Sasson, 2010; Green et al., 2018; McMahon et al., 2019; Morrow Kerns & Kendall, 2014; Pfeiffer et al., 2005; South & Rodgers, 2017; Spielmann & Miller, 2021). Similar findings exist in adult studies that are not autism specific, in which differences in SI/P have been linked to depression, social anxiety disorder, obsessive–compulsive disorder, and more (Hofmann & Bitran, 2007).

In this study, we have investigated responses to the Grand Sensory Survey (GSS), an internet-based questionnaire created and curated by the Autistic Empire, an autistic self-advocacy group based in London, England. The survey design was completed without input from the analysis team, who became involved only after the questionnaire had been online for several weeks. Analysis was completed with very little input from the survey design team. However, both teams are fully represented as authors of this article (see Figure A.1 in the Supplemental Appendix, available online with this article at https://research.aota.org/ajot). The research question we address here—that is, what is the relationship between SI/P differences and mental health concerns reported by autistic adults?—is exploratory. We deliberately avoided forming a hypothesis because of the participatory and exploratory nature of the study.

Importance

Evidence-based practice (EBP) involves treatment effectiveness related to clinical and neurophysiological research, clinical wisdom and experience, the voice of the people being "helped," and therapy context (Tomlin & Borgetto, 2011). It is a central tenet of occupational therapy practice (American Occupational Therapy Association, 2020; World Federation of Occupational Therapists, 2021); yet, at times, EBP is overrepresented by research, overlooking the contributions of clinical expertise and, importantly, lived experience and context. This survey provides the field with the unusual and valuable opportunity to consider other evidence—data gathered by and for one population we aim to support.

Method

Objective

Through retrospective data analysis of the GSS, the analysis team intended to expand conceptualization of everyday differences in SI/P among autistic adults and explore the intersection with mental health. Our approach was deliberately exploratory. Ultimately, this study is an exploration of the importance of SI/P to mental health, a unique angle on well-being in which

occupational therapy practitioners have decades of expertise.

Context for the Grand Sensory Survey

The GSS was developed by members of the Autistic Empire, an autistic social organization built by and for autistic adults to form community based on autism as a civic identity and to provide practical tools and services for all autistic people (see https://www.autisticempire.com). Based in the United Kingdom, Autistic Empire leaders are all autistic and include Sarah McCulloch (OTR) and Alex Mason (Area Lead for Research). The survey design team felt that although recognition of SI/P differences as important contributors to health and wellness was improving, it was also quite narrow in the specific areas that it recognizes. Some of this restriction is based on mainstream assumptions that how people experience the world through their senses is widely universal and that sensory systems are somewhat binary (i.e., they either work or they do not). These common misconceptions have an unfortunate logical consequence: Anyone who demonstrably processes things differently must not only be broken but broken in the same way. The survey design team therefore set out to capture data on SI/P differences. They included differences that have been included in existing literature and those that are known but have not yet been commonly recognized within health care discourse (see later discussion). Fascinated by the potential of the survey, the STAR Institute for Sensory Processing used its social media platform to share the GSS, and a partnership was formed.

The GSS was hosted on social media, which have provided accessible and usable platforms for populations who have previously been on the periphery of community because of differences in spoken communication and "social skills." This group includes the autistic population, who have reportedly been using social media before the phrase was coined (Silberman, 2015). Indeed, the online presence of the #actuallyautistic community is large, is somewhat cohesive, and at times offers a supportive network for bonding and social connection (Wang et al., 2020). Autistic self-advocates and autistic educators are a noticeable driving force within this online community, many of whom have accounts with an excess of 10,000 (and even 100,000) followers (e.g., Hammond, Holmans, Howes, Kraemer, Rose). Autistic advocacy and self-advocacy networks also use social media platforms for communication and dialogue with autistic and nonautistic communities (e.g., Foundations for Divergent Minds, Autistic Self Advocacy Network, Ausome Ireland, Autistics United Canada; also see Wang, 2021). This survey, therefore, could be perceived as a previously unavailable organic invitation and opportunity to listen to the autistic community.

Survey Design Team

The survey design team and analysis team worked separately. The GSS was designed by the survey design team (Sarah McCulloch and Alex Mason from Autistic Empire) and was launched in September 2018. Face validity was achieved via feedback from other members of the Autistic Empire (team members' roles, experience, and organizational affiliations can be found in Table A.1 in the Supplemental Appendix).

The survey design team's initial research focus was investigating wide-ranging sensory experiences in autism. Survey items (Table 1) sought to capture demographic information about respondents along with respondents' experiences with SI/P and mental health. The survey link was shared on Facebook, Twitter, and Instagram. In December 2018, the STAR Institute for Sensory Processing began to share the survey over their social media accounts (i.e., Instagram, Facebook, and Twitter) and via eblast to their mailing list. The survey was open from September 2018 through June 2019.

The analysis team provided consent for these preliminary data to be used to answer our research question. This retrospective data analysis was approved by the Colorado State University institutional review board (No. 1745).

Participants

The GSS was available internationally and without restrictions: The survey was only available in English. A total of 440 responses were received. Responses from participants younger than age 18 yr ($n = 24$) were excluded, resulting in a total of 416 submitted survey responses. Of the 416 responses, 45.4% ($n = 189$) were submitted by participants who identified as autistic, and 35.3% ($n = 147$) identified as nonautistic. An additional 19.2% ($n = 80$) of respondents did not provide a response to this query. Respondents were not asked whether they had been professionally diagnosed. Because of missing data, the number of respondents included in the analyses varies.

Autistic respondents were 56.1% ($n = 106$) male, 22.2% ($n = 42$) female, and 16.9% ($n = 32$) nonbinary or other (4.8% [$n = 9$] did not respond). They represented the following age groups: 18–24 yr (19%, $n = 36$), 25–34 yr (31.2%, $n = 59$), 35–44 yr (27%, $n = 51$), 45–54 yr (16.9%, $n = 32$), and ≥55 yr (3.7%, $n = 7$). They came from all over the world, primarily from the United Kingdom (42.3.9%, $n = 80$), North America (40.2%, $n = 76$), and Australia (6.3%, $n = 12$), with the remaining respondents hailing from Europe, South America, Asia, Africa, and Australasia.

Positionality

The questionnaire was designed by a British team based in London, but it used culturally specific language in only one question (regarding waistcoats). Both members of the survey design team and one

Table 1. Grand Sensory Survey Items by Sensory Processing Categories

Item	Perception	Registration	Sensitivity	Disrupted Sensory Processing
How good do you consider your hearing?	✓			
Do you have tinnitus?				✓
Can you re-create sounds in your head (e.g., if remembering a song, can you hear it in your head)?	✓			
Do you hear voices while fully awake?				✓
Do you hear voices while falling asleep or waking up?				✓
How distressing do you consider unexpected loud noises?			✓	
How distressing do you consider sirens?			✓	
Do you experience visual snow?				✓
Do you have aphantasia (the inability to see mental images)?				✓
Are you averse to bright lights?			✓	
Do you experience halos around light sources?				✓
Do you have prosopagnosia (face blindness)?				✓
Do you find fluorescent lighting uncomfortable to look at?			✓	
Do you wear glasses (or contact lenses)?	✓			
Do you have a sense of smell?		✓		
How strong would you say your sense of smell is?				
Are you a supertaster?				
Can you reliably touch your nose (or any other major body part) with your eyes closed?	✓			
Are there materials you can't wear because of sensitivity?			✓	
Which tightness of clothing do you prefer?				
Do you wear waistcoats?				
Do you enjoy or feel the need to touch certain textures (e.g., stroking a carpet or rubbing clothing seams)?				
How much do you like hugging?				
Are you sensitive to light touches (such as someone brushing against you)?			✓	
Do you feel hunger?		✓		
Do you feel thirst?		✓		
Do you feel the cold?		✓		
Do you ever feel itchy?		✓		
Are you ticklish?			✓	
Do you experience motion sickness?			✓	
Do you experience ASMR?				✓
Do you regularly (once a week or more) experience sensory overload?			✓	

Note. For dichotomous questions, response options were "yes" or "no." For scaled response questions, response options were about frequency (i.e., *very rarely, rarely, occasionally, frequently,* or *very frequently*) or intensity (i.e., *not at all, moderately,* or *extremely*). Items without a check mark did not fit into a category and were not included in the analysis. ASMR = autonomous sensory meridian response.

member of the analysis team are autistic, which also offered a unique cultural and "insider" perspective to the study. It is notable that this project offers autistic majority–led research with a focus on autistic adults—both positions that are underrepresented in the literature.

Procedures and Data Analysis

Survey responses were stored in a secure database at the Autistic Empire headquarters. For this initial analysis, only closed-ended survey questions that were presented to all participants were analyzed (i.e., responses to open-ended or conditional questions were not included). The database had several variables related to SI/P. To reduce the number of variables for analysis and to develop coherent classifications, the analysis team first characterized the questions themselves using open coding followed by axial coding. This procedure enabled subsequent regression analysis and identification of linkages between data. Coding of the questions was completed by each researcher and discussed as a whole group until any inconsistencies were resolved. Item categories are presented in Table 1 and are defined in Table 2.

Terminology not usually included in discussions regarding the sensory integration process as conceptualized by Ayres is defined in the following sections.

Aphantasia

The term *aphantasia* refers to a limited, or lack of, ability to visualize images (Zeman et al., 2015). With aphantasia, the capacity to generate mental imagery, sometimes referred to as *mentalization* (Wicken et al., 2021), is absent or incomplete across all sensory systems (Dawes et al., 2020). This lack of mental imagery is implicated in challenges with episodic memory, ability to imagine future events, and dampened emotional response to oral or written narratives versus viewing a story or event (Dawes et al., 2020; Wicken et al., 2021). Moreover, aphantasia is associated with difficulties with imagination, task motivation, and face recognition (Milton et al., 2021) as well as lower sensory sensitivity (Dance et al., 2021). People with aphantasia also report more characteristics commonly associated with autism than those without (Dance et al., 2021; Milton et al., 2021), suggesting an association between autism and aphantasia. Conversely, however, and in keeping with the incredible heterogeneity within autism, other research has indicated that imagery may be elevated among autistic people (Soulières et al., 2011).

Tinnitus

Tinnitus is often described as "ringing in the ear" and involves the "perception of a sound that has no external source" (Bauer, 2018, p. 1224). It may be correlated with hyperacusis symptoms, and both tinnitus and hyperacusis have been found to be more prevalent among autistic people (Danesh et al., 2015, 2021; Ren et al., 2021). *Hyperacusis* refers to the experience of low-intensity sounds or sounds considered within average range as painful.

Visual Snow

Visual snow is a neurological condition that involves visual disturbances described as tiny dots, static, or snow over the entire visual field (Puledda et al., 2018; Schankin et al., 2014). Visual snow syndrome (VSS) requires the presence of additional visual symptoms such as floaters, afterimages, and photophobia; some argue that VSS itself may exist on a spectrum (Puledda et al., 2018, 2020). Experience of visual snow commonly co-occurs with migraines and tinnitus but has been clearly distinguished from hallucinogen persisting perception disorder (Puledda et al., 2020). Research suggests that visual snow and tinnitus may share a common pathophysiologic mechanism. The connection between autism and visual snow is widely discussed on social media (Autism Forums, 2021; Autisticats, 2020; autistictic, 2018; Dec_bot, 2018; de Kok, 2017) and is briefly referenced on the American Academy of Ophthalmology EyeWiki (https://eyewiki.org/Main_Page). However, we did not find any studies examining the relationship between visual snow and autism.

Prosopagnosia

Developmental prosopagnosia (DP) involves limited or no facial recognition in the absence of neurological injury (Murray et al., 2018). Many people with DP do not realize they have it until adulthood, and insight is limited into specific contributing sensory processing or perceptual differences. Prosopagnosia is more common in the autistic than the nonautistic population; in one study of autistic adults with "no intellectual

Table 2. Item Categories

Category Name	Definition	Includes
Sensory perception	Regard and recall of primary sensations	Visual, auditory, proprioceptive
Sensory registration	Detection of sensory inputs	"Do you feel"–type questions
Sensory sensitivity	Related to experiences of distress or discomfort caused by sensation	
Disruptions in SI/P[a]	Related to phenomena outside current theoretical constructs related to SI/P as informed by Ayres	Tinnitus, visual snow, prosopagnosia, and ASMR

Note. Item categories were identified after open and axial coding of the questionnaire produced by the survey design team. This method allowed identification of categories for regression analysis that are meaningful to the autistic population. ASMR = autonomous sensory meridian response; SI/P = sensory integration and processing.
[a]This category includes conditions that are not typical of other SI/P report measures.

disability," more than one-third of the 80 participants demonstrated prosopagnosia (Minio-Paluello et al., 2020).

Autonomous Sensory Meridian Response

Autonomous sensory meridian response (ASMR) describes a subjective, involuntary experience of a typically pleasant tingling sensation in response to sensory and social triggers (Poerio et al., 2018). ASMR is considered relaxing, as opposed to being associated with excitement or physiological arousal such as aesthetic chills (Poerio et al., 2018). People who self-identify as having ASMR report feelings of calm that are associated with reduced heart rate and increased skin conductance level while watching ASMR videos (i.e., videos designed to elicit ASMR through triggers; Poerio et al., 2018). These opposing emotions and physiological outcomes suggest the emotional complexity of ASMR (Poerio et al., 2018). Triggers are not consistent for all people, although lower pitched, complex sounds appear to be the most experienced ASMR triggers (Barratt et al., 2017). ASMR videos—audiovisual experiences—have become an internet subculture, and users describe accessing videos as a form of self-regulation (Galante & Alam, 2019; Poerio et al., 2022). ASMR is associated with self-reported sensory sensitivity to both exteroceptive and interoceptive cues (Poerio et al., 2022). A small number of studies examining ASMR exist, often with the question of how it might be intentionally accessed to support well-being (Galante & Alam, 2019; Poerio et al., 2018, 2022). Autism and ASMR have been connected in social media (Beardsley, 2020; Mcallister, 2019), mainstream media (Carter, 2019), and at least one research study (Galante & Alam, 2019).

Two variables clearly addressed commonly noted differences in mental health: "Are you depressed?" and "Do you consider yourself to have an anxiety disorder?" In examining the relationship between SI/P features and anxiety and depression, we conducted two binomial logistic regression analyses. This statistical approach can be used to predict the presence or absence of a dependent variable. In this study, it allowed us to determine whether the SI/P variables we identified via open and axial coding (sensory perception, sensory registration, sensory sensitivity, and disruptions in sensory processing) would predict anxiety and depression among autistic adults.

Results

Linearity of the continuous variables with respect to the logit of the dependent variable was assessed via Box and Tidwell's (1962) procedure. This data transformation process established that the dependent variable was linear and allowed us to run logistic regression. A Bonferroni correction was applied with all nine terms in the model, resulting in statistical significance being accepted when $p < .006$ (Tabachnick & Fidell, 2014). A Bonferroni correction accounts for multiple analyses, making the calculations for significance more rigorous. On the basis of this assessment, all continuous independent variables were found to be linearly related to the logit of both depression and anxiety, our dependent variables.

The logistic regression model for anxiety identified no standardized residual exceeding 2.00. The model ($n = 224$) was statistically significant, $\chi^2(4) = 29.64$, $p < .001$. The model explained 16.6% (Nagelkerke R^2) of the variance in anxiety and correctly classified 65.2% of participants. Sensitivity was 73.8%, specificity was 54.1%, positive predictive value was 67.4%, and negative predictive value was 61.6%. Of the four predictor variables, sensory sensitivity and differences in sensory processing were statistically significant (Table 3).

The logistic regression model for depression identified no cases with a standardized residual exceeding 2.00. The revised population ($n = 222$) was statistically significant, $\chi^2(4) = 33.97$, $p < .001$, and explained 18.9% of the variance (Nagelkerke R^2). This model overall correctly classified 63.5% of participants. Sensitivity was 64%, specificity was 77%, positive predictive value was 62.1%, and negative predictive value was 64.7%. Of the four predictor variables, differences in sensory processing and sensory sensitivity were statistically significant (Table 4).

Discussion

Our results support the wealth of previous work showing a link between sensory sensitivity and anxiety among autistic people (Glod et al., 2015; Green & Ben-Sasson, 2010; South & Rodgers, 2017). We also found that sensory sensitivity and disruptions in SI/P predicted self-reported depression, a finding somewhat consistent with those of other investigations among younger children (Ben-Sasson et al., 2009; Hudson et al., 2019; Rossow et al., 2021); this finding was also

Table 3. Logistic Regression Predicting the Likelihood of Anxiety on the Basis of Sensory Categories

Category	*B*	*SE*	Wald[a]	*df*	*p*
Sensory perception	0.25	0.53	0.23	1	.631
Sensory registration	0.35	0.88	0.16	1	.688
Differences in sensory processing	2.95	0.72	16.66	1	<.001
Sensory sensitivity	2.48	0.92	7.20	1	<.007
Constant	−9.87	2.27	18.88	1	<.001

[a]Used to determine statistical significance for each independent variable.

Table 4. Logistic Regression Predicting the Likelihood of Depression on the Basis of Sensory Categories

Category	*B*	*SE*	Wald[a]	*df*	*p*
Sensory perception	0.35	0.53	0.45	1	.503
Sensory registration	−0.99	0.88	1.25	1	.264
Differences in sensory processing	3.04	0.72	17.94	1	<.001
Sensory sensitivity	2.50	0.95	6.98	1	.008
Constant	−8.35	2.20	14.40	1	<.001

[a]Used to determine statistical significance for each independent variable.

identified in a scoping review conducted by Kotsiris et al. (2020), which included, but did not solely focus on, autism. Interestingly, the GSS queried basic sensory perception and registration—something other studies have not examined. With our predictive model, we did not find that these sensory processing features were related to self-report of either anxiety or depression. Although links between sensory reactivity differences and anxiety, and between sensory reactivity differences and depression, have previously been shown, our finding that SI/P disruptions were related to both of these mental health concerns is new; this relationship has not been explored to any great extent.

Disruptions in Sensory Integration and Processing

These factors add dimensionality to the template for SI/P and appear to specifically relate to perceptual phenomena, namely, additive sensory stimuli (visual snow or ASMR) and absent sensory data (face blindness or absence of visualization). These differences create a significantly divergent day-to-day experience of the world for the person experiencing them and might be described as sensory disruptions. The potential influence of these client factors on health, well-being, and participation in life may be far reaching and complex. Although several of these disruptions in SI/P have been identified among autistic people (Dance et al., 2021; Minio-Paluello et al., 2020; Williams et al., 2021), the link to mental health concerns has not been previously investigated. This finding suggests not only that SI/P is different among autistic people but also that the presence of these disruptions can negatively affect mental health.

Inclusion of these differences in sensory experiences adds a new layer of complexity in understanding the link between both anxiety and depression and SI/P among autistic people, one that we identified in this investigation but did not tease apart. It also leads to many further questions as we seek to offer sensory informed support to autistic clients throughout the lifespan.

In both analytical models (querying the link between SI/P and mental health among autistic people), we explained only part of the variance in self-report of mental health concerns, indicating that other factors need to be considered. Relative to anxiety, South and Rodgers (2017) have suggested that the relationship between sensory sensitivity and anxiety among children was mediated by a third factor, intolerance for uncertainty. Normansell-Mossa et al. (2021) found that the relationship among sensory sensitivity, anxiety, and intolerance for uncertainty was also characteristic of autistic adults. Intolerance for uncertainty is an inescapable aspect of human nature and has been linked to perceived sense of threat and safety by many (Cupid et al., 2021; Morriss et al., 2019; Tanovic et al., 2018). In the neuromajority population, intolerance to uncertainty diminishes as safety and certainty in the environment are increasingly perceived, a change that has been linked to evolutionary adaptation. Intriguingly, Normansell-Mossa et al. (2021) have indicated that much about the autistic lived experience may interfere with the process of dealing with uncertainty for autistic adults. The GSS did not address intolerance of uncertainty, but it appears to be an additional factor to consider when looking at the relationship between sensory reactivity and anxiety among autistic adults. This consideration leads to questions suggesting the necessity of investigations into differences in SI/P, sensory sensitivity, sensory disruptions, and influence on felt safety among autistic adults.

Depression is itself highly prevalent among autistic people, with estimates of this mental health concern in more than 40% of autistic adults (Gotham et al., 2015; McLeod et al., 2021) and a higher rate of depression among autistic adults than that reported for children (Hollocks et al., 2019). Using network theory to examine the relationship between autism and depression, van Heijst et al. (2020) have posited that the relationship between autism and depression may in part be related to the degree to which autistic adults perceive themselves to have control over life. The sense of not having control of one's life, of agency, is worth consideration when looking at SI/P differences, disruptions, and sensitivities among autistic adults. Future research with a focus on the interaction between SI/P and mental health among autistic adults is needed. Ultimately, this article is about well-being and, explicitly, the centrality of SI/P to wellness—a unique angle on well-being in which occupational therapy practitioners have decades of expertise.

Limitations

In this study, we have focused on participant self-report of experiences with some mental health and

sensory differences. Because of the retrospective and exploratory nature of this initial investigation, detailed analysis of response patterns was not possible. For example, we were unable to analyze responses to conditional questions (e.g., when responding "yes" to "do you have tinnitus?" a conditional follow-up question asked "how debilitating do you consider it?"). Many respondents did not respond to the conditional follow-up, and the nature of these missing data was unclear. Variation in readability among items in the survey design was present and may not have adequately catered to the reading level of respondents. Future survey design will incorporate health literacy best practice and keep questions unidimensional whenever possible (Ruel et al., 2015). In addition, many surveys were incomplete, and we are unable to speculate as to why. Finally, the psychometric properties of this initial survey are unknown. The design was openly informal on this first iteration and was not designed with empirical rigor in mind. The analysis team joined the project after survey launch. However, the survey was developed by autistic people with knowledge of sensory and mental health experiences, signifying that the developed questions are worthy of additional exploration.

An additional limitation of note is that much of the extant literature looking at SI/P and aspects of mental health is focused on children. Although we have used this child-based literature in our article to inform interpretation, we are cognizant that when information is available for autistic adults, findings are often somewhat different. More research focused on autistic adults is crucial.

Future Considerations

The authors, including the developers, intend to develop and launch the GSS (Version 2) on the basis of knowledge gained in this study. Additional content might include questions concerning the following items:

- Processing of proprioceptive and vestibular inputs;
- Movement and motor planning (posture, muscle tone, ocular motor function, etc.);
- Strategies that respondents use to cope with or manage differences in SI/P, along with mental health concerns; and
- Influence of environments on experiences of disability related to differences in SI/P.

It may also be helpful to identify respondents who are professionally diagnosed and those who self-identify as autistic as well as other markers that contribute to the exploration of autistic phenotypes and how they correlate with significantly clustered sensory differences.

Implications for Occupational Therapy Practice

Results suggest the following implications for occupational therapy practitioners working with autistic adults:

- Clinical reasoning must investigate interrelated client factors of SI/P and mental health, including the sensory domain having a "place at the table" whenever client well-being is the focus.
- The clinical lens must include and consider sensory disruptions (e.g., hyperacusis, tinnitus, visual snow, prosopagnosia, aphantasia). How can we accurately identify the presence of these disruptions across the lifespan? What evidence-based therapeutic supports should be included in the occupational therapy practitioner's repertoire to accommodate for or mitigate these differences?
- Adult mental health settings should consider mapping out a process toward including evaluations that deeply examine the differences in SI/P of their clients. Collaboration with sensory integration–certified colleagues or acquiring such certification as part of professional development plans is indicated.

Across the lifespan, the following implications have been identified:

- Taking a holistic approach to client well-being includes consideration of SI/P client factors alongside psychological well-being. We are called to equip ourselves in supporting clients across domains (within our scope of practice).
- If autistic adults are reporting sensory disruptions such as hyperacusis, tinnitus, visual snow, prosopagnosia, and aphantasia, what are the implications for pediatric populations? The necessity of developing better understanding of how we can support, advocate for, accommodate, and empower our pediatric clients is clear.

Conclusion

Our unique ability or capacity to process and integrate sensation has tremendous potential to support or disrupt function and flourishing. Day-to-day occupations—completed by our dynamic and complex human brains and bodies—occur within sensory-rich contexts and interpersonal interactions and, in turn, generate a new stream of sensory data to be processed and integrated.

This study clearly demonstrates that SI/P, as a domain of health and wellness, is a topic of interest to autistic adults and that disruptions to SI/P and sensory sensitivities are heavily implicated in at least some aspects of psychological well-being. Moreover, the survey content and responses that are outside the typical sensory integration frame demonstrate that this domain is broader and more complex than we tend to allow for. SI/P involves more features than have been investigated in the current literature. Health in SI/P—the highest attainable state of neurosensory functionality—influences function and participation. Thus, it behooves the occupational therapy practitioner to listen to the voices of the autistic population we propose

to serve and investigate and take seriously the expanded dimensions of SI/P that are being reported.

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