Toward Overcoming the Double Empathy Problem: Bridging Autistic and Neurotypical Minds Through Science and Art

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Toward Overcoming the Double Empathy Problem: Bridging Autistic and Neurotypical Minds Through Science and Art

Elizabeth Rose Bessey

A thesis submitted to the faculty of Brigham Young University in partial fulfillment of the requirements for the degree of Master of Science

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ABSTRACT

Toward Overcoming the Double Empathy Problem: Bridging Autistic and Neurotypical Minds Through Science and Art

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Master of Science

Historically, autistic people have been portrayed as lacking empathy. However, more recent research reveals mutual, rather than one-sided, gaps in empathy between autistic and neurotypical (NT) people. Decreased empathy can lead to marginalization and even violence, usually toward those in the minority. Regardless of diagnosis, however, there are fundamental aspects of the human experience upon which empathy could be built. In the present study, we explored commonalities and differences in how autistic and NT individuals experience comfort and discomfort. Semi-structured interviews were conducted to discover the causes, emotions, and reactions to comfortable and uncomfortable social situations and environments across autistic and NT individuals. Thematic analysis revealed three universal influences of comfort and discomfort across groups, including social influences, environmental influences, and personal/emotional influences. Each of these main themes revealed subthemes exploring how autistic and NT individuals differ and overlap. Analysis of all themes, subthemes, and codes revealed that autistic individuals differ in degree and frequency, rather than type, of factors influencing comfort and discomfort. Knowledge of these themes and findings could help to challenge the outdated belief in autistic empathy deficits and promote empathy-building.

Keywords: double empathy problem, autism, empathy, neurodiversity, thematic analysis
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Introduction

Humankind has an innate desire for connection and belonging. The emotional and social bond between two people is often facilitated by empathy. The available literature offers multiple definitions for and steps to achieve empathy, though there is no fully agreed-upon definition. For instance, Fletcher-Watson and Bird (2020) claim there are roughly three steps to what we define as empathy. These steps include identifying that someone else is feeling something, correctly interpreting that behavior, and feeling those same feelings. Generally, empathy is understood to be based on a person’s ability to “read” what others are feeling and thinking based on their words, actions, gestures, facial expressions, and other cues, and perhaps, feel those same feelings and identify deeply with those thoughts (Riess & Neporent, 2018). Although it is difficult to perfectly capture empathy, there are various facets of empathy, such as cognitive empathy (i.e., theory of mind), emotional empathy (i.e., experience sharing and personal distress), and motivational empathy (i.e., compassion). Each of these forms of empathy individually impact how a person connects with and understands another and can therefore be used to facilitate empathy between different groups of people (Zaki, 2019).

A lack of empathy between individuals or groups can have extremely adverse effects, including dehumanization, marginalization, disconnection, prejudice, aggression, and even large-scale violence (Baron-Cohen, 2022). Although we live in a world of different cultures, people, opinions, and views, many experiences are shared across humanity in one way or another. If, instead of highlighting the differences between people, we focused on these shared experiences, would it be possible to facilitate empathy between different groups of people that typically consider themselves distinct? The current study aims to investigate a novel method for understanding similarities and differences and building empathy between autistic and
neurotypical (NT) people—two groups that often find it difficult to connect (Milton, 2012; Mitchell et al., 2021).

Autism spectrum disorder (ASD) is understood to be a neurodevelopmental condition, present from birth, that is currently defined by its behavioral characteristics. These core characteristics include difficulties with social interaction, in social imagination, and in verbal and nonverbal features of communication (American Psychiatric Association, 2013). Autistic behavioral characteristics are labeled as “impairments” in social interaction, theory of mind, and empathy (Milton, 2012). When empathy is bundled together with social cognitive processes like the theory of mind, autistic individuals are often labeled as lacking empathy (Fletcher-Watson & Bird, 2020).

Historically, autism has been treated using a medical model aimed to fix any deficits or impairments exhibited during social interaction, which is meant to assist autistic individuals to better function in society (Chown, 2014). This treatment often involves modifying the autistic person’s interaction style to fit in with the mainstream culture of society (Milton, 2012). Recent research, however, has turned away from the medical model and towards the social model, which claims that an individual’s disability emerges entirely from society’s responses to the individual’s deficits (Dwyer, 2022). This theory suggests that the misunderstandings in interactions between autistic and NT people could be partially due to different expectations or preferences in social interactions (Milton et al., 2022). Several studies have shown that difficulties with empathy demonstrated by autistic persons are most significant when interacting with NT individuals, but less so with others on the autism spectrum (e.g. Mitchell et al., 2021). In contrast, when autistic people communicate with others on the spectrum, they regularly demonstrate a unique interaction style that allows them to connect well with each other
(Crompton et al., 2020; Heasman & Gillespie, 2019). Thus, the desire and capacity for empathy is present in autism, though the manner in which autistic people empathize with others may differ from that of NT people in some ways.

These above notions raise the question: Who carries the burden of the disconnection in empathy between NT and autistic individuals? That is, although autistic people are likely to make misperceptions during conversations with NT people, NT people are just as likely to misperceive autistic people (Sheppard et al., 2016). In 2012, Milton termed this gap in empathy between autistic and NT people as the double empathy problem (Milton, 2012).

The Double Empathy Problem

The double empathy problem is defined as “a disjuncture in reciprocity between two differently disposed social actors which becomes more marked the wider the disjuncture in dispositional perceptions of the lifeworld—perceived as a breach in the ‘natural attitude’ of what constitutes ‘social reality’ for ‘non-autistic spectrum’ people and yet an everyday and often traumatic experience for ‘autistic individuals’” (Milton, 2012, p. 884). The more cognitively similar two individuals are, the easier it will be for them to relate and empathize with each other. Autistic and NT individuals have neurological differences, and thus each hold different expectations for the other during a social interaction. Misunderstandings in communication are not solely a consequence of autistic ‘impairment’ but rather a mutual failure to reach a consensus through bilateral empathy (Williams, 2021).

Milton first demonstrated the double empathy problem through a research study using filmed clips of NT and autistic people’s greetings. Both autistic and NT participants were asked to watch and rate the person in the film based on likeability and their desire to interact with them in the future. Across participants, NT people rated autistic people’s greetings as the less-
desirable. Autistic participants rated fellow autistics as more desirable communication partners (Milton, 2012). This study brought a new perspective to this division between groups, by highlighting the lack of desire that both groups have to interact with each other. Milton’s study sparked the interest of many other researchers who wished to explore the double empathy problem and its implications.

For example, Chown (2014) found that an individual’s ability to develop the theory of mind (TOM) heavily relies on the frequency and opportunity for social interaction, having a shared physical environment, and shared world knowledge (Chown, 2014; Williams, 2021). If roles were reversed in society, and NT people were given the same level of interaction with their peers as autistic individuals have in society today, autistic individuals would likely develop TOM abilities similar to non-autistic TOM. Autistic individuals’ TOM deficits (often associated with “empathy”) are partly dependent upon the nature of society and may be different if roles were reversed (Chown, 2014). Although autistic and NT individuals share common environments, they sometimes process their environments in significantly different ways due to sensory differences and cognitive load (Williams, 2021).

Murray et al. (2022) found that NT individuals adjusted more easily to various environments and could focus their attention on specific social/contextual demands. Autistic individuals, on the other hand, had their attention pulled in many directions due to the variety of sensory stimuli. With these more intense attentional peaks, autistic individuals appeared to have an “empathy deficit” when in reality it was more of a “preoccupation surfeit.” The quality of sensory experience and the ability to gain trust within an environment are two of the biggest differences found between autistic and NT individuals (Murray et al., 2022). These differences in processing make it difficult for both parties to correctly identify the other’s inner state and infer
the event that caused the inner state based on their external behaviors—a skill highly connected with the ability to empathize (Nicolaidis et al., 2019; Wu et al., 2019). Though difficult in practice, visual art may provide a medium in which these differences in individuals can be illustrated and understood to facilitate empathy between seemingly different groups of people.

The Impacts of the Double Empathy Problem

Unfortunately, a gap in empathy between groups has the potential to lead to a host of problems, especially for those groups who are in the minority or marginalized (Baron-Cohen, 2022). In most situations, there are far fewer autistic individuals than NT people. This imbalance creates significant social pressure for autistic individuals to conform to NT rules and expectations. Social pressure can be associated with a decrease in quality of life as exhibited through camouflaging, mental health challenges, and physical discomfort. Due to this social pressure, autistic individuals may feel the need to mask their tendencies to conform to societal pressures. Those who work to hide their symptoms of autism during social situations are referred to as “camouflaging” (Corbett et al., 2020).

The key motivation for camouflaging is the individual’s desire to increase social and emotional connections with others (Corbett et al., 2020). Camouflaging can have significantly negative effects on individuals’ self-esteem and mental health. Autistic individuals camouflage their true characteristics in order to fit in society and avoid feelings of social rejection and isolation. This constant pressure to camouflage their true characteristics is both exhausting and stressful (Mitchell et al., 2021). The lack of understanding and empathy they receive in these situations greatly impacts autistic individuals’ risk of poor mental health and suicidal ideation. Previous reports indicate that approximately 79% of autistic adults meet the criteria for a psychiatric condition (Lever & Geurts, 2016) and up to 72% experience suicidal desire (Cassidy
et al., 2014, 2018), with suicide being the leading cause of early death in this population (Cassidy, 2020).

The double empathy problem has the potential to have significant impacts on society as a whole. For example, as social norms are pushed upon autistic people, the majority of society misses the opportunity to gain new knowledge and insights from a group of people who inherently experience the world differently. Yergeau (Nicolaidis et al., 2019, p. 9) stated, “Autistic people have such rich relationships with other people as well as animals, things, and their broader surroundings. I would hate to see that be discounted or seen as an impairment.” Temple Grandin is an inspiring example of how autistic individuals’ strengths can benefit society. Through her unique talents and abilities, she created a safe and humane animal handling system. She continues to consult with many large corporations across the world, benefitting thousands. If autistic individuals are expected to conform to the majority of society, society loses valuable opportunities, talents, and benefits.

Overcoming the Double Empathy Problem

Marginalization of minority groups can be decreased through the lens of neurodiversity. The theory of neurodiversity acknowledges neurological differences, yet sees these differences as an aspect of diversity within the whole human spectrum, rather than a deficiency (Dwyer, 2022; Murray et al., 2022). In 2011, researchers found that autistic traits are a continuous variable that span across all of humanity. The line between ‘autistic’ and ‘NT’ may not be as clear-cut as traditionally held, but includes a broad range of traits and severities (Gerdts & Bernier, 2011; Murray et al., 2022). Characteristics such as reactivity, anxiety, sensory processing, and cognitive abilities span the human spectrum, affecting both autistic and
nonautistic individuals (Gerdts & Bernier, 2011). These findings suggest that there are significant similarities and overlaps in autistic and NT peoples’ experiences.

Both NT and autistic individuals share many needs and desires (Murray et al., 2022). Three autistic participants and one NT participant shared their personal experiences in various environments. Mutual themes of trust, emotionality, and states of mind were found among all participants. Each shared sensitivity to similar types of environments, such as the need for a familiarity of routine and safe kinship, but to different degrees. All participants reported the importance of having a social context in which they can express their needs and frustrations safely (Murray et al., 2022).

There is great value in taking a position of humility in the face of difference and in emphasizing the need to build understanding between people. Many advocate the notion that society is not comprised of the binary of autistic and NT people, but rather, is a continuous spectrum of neurodiversity (Milton et al., 2022). Each individual, both autistic and NT, offers unique strengths and weaknesses. Many researchers have explored a variety of ways to increase society’s understanding of neurodiversity and build empathy between neurodivergent individuals.

Chapple et al. (2021) used literature and reflective dialogue to increase empathy between three autistic individuals and one non-autistic individual. By discussing a work of fiction, participants had an easier time beginning and maintaining a conversation. Conversation within a common context (e.g., a fictional book) allowed room for them to explore their nuanced differences in reasoning and experiences, and lead to increased connection and empathy between individuals (Chapple et al., 2021).
Gaudion et al. (2014) provided an alternative perspective on how to increase empathy through building creation and design. As mentioned previously, the physical environment plays a large role in an individual’s ability to successfully interact with others. Rather than focusing on the design alone, a designer was asked to connect, listen, and interpret how an autistic person felt and interacted with their environment. Once the designer knew how the autistic individual felt and interacted with certain stimuli in their environment, the designer had a greater understanding of the autistic person’s emotional responses to their environment. Through listening, watching, and stepping into another’s shoes, empathy was built between the non-autistic designer and the autistic individual. Both literature and building design are mediums that show great potential in facilitating or bridging connections between people.

Visual art provides a promising means to see into another’s mind and understand their personal experiences. Throughout history, art has been used to build community through empathic social interaction (Jeffers, 2009). Visual art can immerse its viewer into another person’s reality for the sake of understanding. Both empathy and art share similar values. Each require an individual to become immersed in another’s perspective to build understanding. A study at the University of Hong Kong revealed that sharing art pieces of patient experiences expanded participants’ understanding and increased their empathy for their medical patients (Potash & Chen, 2014). Visual art gives individuals the opportunity to observe and reflect for an extended period of time. It allows individuals to step outside themselves and provides insights into another individual’s mind and reality. As empathy is the process of observing and stepping into another person’s mind, art can be a valuable facilitator for creating and building empathy (Dominiczak, 2017; Peloquin, 1996; Phillips, 2003; Xu, 2021).
Through immersion into another’s reality and developing an understanding of the expressed emotions, art connects people. Art’s moral purpose is stated to, “remove prejudice, do away with the scales that keep the eye from seeing, tear away the veils due to wont and custom, [and] perfect the power to perceive” (Peloquin, 1996). If art truly removes prejudice and holds the power of true perception, it may be one of the most powerful ways to build empathy between neurodivergent and NT individuals. Empathy can be built as individuals tear away assumptions and open their minds to new perspectives (Peloquin, 1996).

**Aim**

The present study aimed to examine overlaps in thinking, feeling, and reactivity to fundamental human experiences across groups of NT and autistic people, and gather visual representations of individual’s thinking, feeling, and reactivity. A future aim of this study is to use these visual representations to build empathy between autistic and neurotypical individuals. We hypothesize that, according to the theory of the double empathy problem, we will observe appreciable differences between autistic and NT individuals based on the analysis of direct quotations of both individuals. However, we also predict that NT and autistic individuals will all exhibit similar patterns of thinking, feeling, and reactivity, albeit during different scenarios. We submit that by drawing from the similarities between these groups, we will ultimately be able to facilitate/build aspects of empathy between them.

**Method**

We recruited six autistic and six neurotypical (NT) people between the ages of 18–26 years old. All autistic subjects had a confirmed diagnosis of autism spectrum disorder (ASD). Subjects were asked to participate in an individual interview for a 60-minute time period. Individuals were given the option to interview in person or via Zoom to accommodate participant
preferences and availability. Participants were provided with the materials and time to create artwork at the beginning of the interview and will sign informed consent as to what is done with the artwork after the interview. All participants reviewed and signed informed consent forms prior to the start of their interview. Study procedures were approved by the Institutional Review Board of Brigham Young University.

Participants

Participants were recruited through a quantitative survey from a previous study, or through personal connections of the individuals involved in the study.

Group One

This group consisted of three male and three female autistic participants. All participants had a confirmed diagnosis of autism spectrum disorder. The majority of these participants were diagnosed early in childhood, with the exception of one female being diagnosed in her 20s. The majority of these participants live in student housing with roommates, independent of their parents. Many are age-normative students pursuing a university education. A few of these participants reside in assisted-living apartments, designed to help autistic individuals transition into living independently. All participants were unmarried and two participants were dating each other. The majority of participants reside in Utah, with the exception of two participants residing in Idaho. All participants identify as White. Each of these individuals were articulate and were able to hold a meaningful conversation for an hour.

Group Two

This group consisted of three male and three female NT participants without a diagnosis of any neurological disorder. All of these participants reside in Utah, and are students studying at a variety of colleges. Many of the participants were independently living with roommates in
student housing, with the exception of one female and one male participant living with their spouses. All participants identify as White, with the exception of one female. One female and one male participant were married to individuals who did not participate in the study.

**Measures**

A complete interview guide of questions, follow-up questions, and clarifications was used during the interview. This interview guide was created based on insights gained from autistic individuals, professors, and research professionals. Refer to Appendix B to see the full interview guide that was used in the study. This guide contained open-ended questions about participants’ own comfortable/uncomfortable experiences, as well as their reactions to the structured setting provided by the interviewers. Follow-up questions and probes were given as needed.

**Procedures**

Based on participant preferences, each participant was interviewed through an in-person one-on-one interview conducted in a clinic room of a campus building (TLRB, BYU Provo) or via Zoom. Each interview began with a brief introduction of the study. We obtained the participants’ informed consent and demographic information. We then allowed them time to create artwork based on their experiences. The interview guide then provided open-ended and follow-up questions with probes as needed. Structured questions walked each participant through a variety of scenarios in which they felt comfortable or uncomfortable. They were each asked to identify the specific factors within the environment that caused them to feel comfortable versus uncomfortable, and also asked to think of alternative environments where they’ve felt similar feelings. Interview questions included environmental/sensory factors as well as social factors that
may have influenced the individual’s experience within an environment. The interview concluded with closing questions and debriefing with each participant.

**Data Analysis**

We used modified interpretative phenomenological analysis (IPA) to analyze participant interviews. IPA is an approach to qualitative research that explores how individuals make sense of their life experiences. It is described as idiographic and is primarily concerned with the details of individuals’ experiences. Through highlighting the differences and similarities between individuals’ experiences, IPA allows researchers to instill interpretations from a hermeneutic approach. Smith (2004, p. 40) describes IPA as phenomenological focus on the individual’s experience and as “strongly linked to the interpretative or hermeneutic tradition in its recognition of the researcher’s centrality to analysis and research. IPA allows researchers to use individuals’ life experiences to create meaningful conclusions and interpretations through a rigorous qualitative analysis process. Below, we describe how we used IPA within the current study.

To facilitate qualitative thematic analysis, we video recorded each interview. A team of trained researchers then orthographically transcribed and coded all interviews. Organization of transcripts, codes, and analysis were facilitated with the ATLAS.ti software package. Each team member began the coding process by watching the videos and reading through interview transcripts multiple times to become intimately familiar with the content and quotations of the interviews. Artwork underwent an informal visual analysis including the analysis of colors, iconography, facial expressions, contexts, etc. that contributed to the interpretation of individuals’ direct quotes. Descriptions of these drawings were formally analyzed with the remainder of the interview transcript. Through becoming intimately familiar with participant
drawings and quotations, the research team took the opportunity to correct any errors in the transcripts. The team took exploratory notes on their thoughts throughout this process.

Based on these exploratory notes, team members then created experiential statements. These statements were specific interpretation and synthesis of their exploratory notes. Team members also filled out analytic memos during this process to create meaningful connections between interviews. Following this process, the team held a meeting to discuss the most salient themes initially observed in the interviews. The recurring themes found within the interviews were systematically turned into codes and put into code groups/categories (e.g., words or phrases describing sensory reactivity, general emotions, interaction preferences, etc.). The research team then met together to analyze these codes and decide which codes would remain or be altered. After finalizing the codes, codes were written down into an initial code book. This book was used by each research team member to review the same interview for a second time and determine quotations of interest and the codes associated with these quotations.

Once research team members finished their initial round of coding interviews, the team met again to discuss and refine each individual’s coding. Through team discussion, a consensus was made on all codes. This process was repeated until all interviews were properly reviewed, coded, and discussed. At this point, the team met again to discuss their codes and modify the code book. The team began another round of coding to give each team member the opportunity to review different members’ codes. The team then met to discuss any changes that needed to be made in the codes and to reach a unanimous decision on the interview’s codes. This process was repeated three times to ensure consistency across codes and researchers.
Finally, the team met to discuss and document the final salient themes across all interviews, including themes, sub-themes, codes, and quotations. Based on these findings, we summarized the themes found, with both quotations and artwork as support.

**Positionality**

I am a 24-year-old White woman born and raised in the United States of America. I hold a Bachelor of Science in Communication Disorders and am currently a master’s student at Brigham Young University in Provo, Utah, studying speech-language pathology. I am a member of The Church of Jesus Christ of Latter-day Saints. Although I have no close friends or family who are diagnosed with autism, my interest in researching the double empathy problem began as I started to work with autistic individuals in a clinical setting during my master’s program. I acknowledge that my background provides certain biases in the interpretation of participants’ interviews, and I strive to be cognizant of these biases and how they shape my research.

**Results & Discussion**

This study aimed to examine overlaps in thinking, feeling, and reactivity to fundamental human experiences across groups of NT and autistic people. Overall, we found both commonalities and differences between these groups’ comfort- and discomfort-related experiences across various settings. Through analysis of each of these factors, three main themes were extracted as causes of comfort and discomfort for both autistic and NT individuals. These main themes suggested that comfort and discomfort were associated with social, environmental, and personal/emotional factors. Within each main theme, subthemes were found as specific elements across groups (see Figure 1). In fact, these subthemes emerged as a series of spectra along which one might experience comfort or discomfort to continuous degrees, depending on
the location at which one found themselves or a situation presented stimuli in a given moment (see Figure 2).

Running throughout the specific themes and subthemes, we observed two overarching findings. First, autistic individuals differed in the frequency and/or degree rather than the type of social, environmental, and personal factors and their implications on the individual (e.g., feelings, reactions, thoughts, etc.; see Figure 2). This finding is consistent with previous reports, specifically regarding sensory processing and the intense attentional peaks that autistic individuals experience in contrast to NT individuals (Chown, 2014; Murray et al., 2022). However, in most existing studies, authors tend to focus on the differences between autistic and NT people, whereas, in the current report, we submit that the similarities in the type of factors relating to comfort and discomfort are areas of potential shared experience. Such overlaps are elements of life upon which NT and autistic people may be able to build empathic connection.

Second, the autistic participants in this study appeared to long for connection with others, and to be “seen” and accepted by them, all while they reported consistently feeling different, judged, and misunderstood by most. Many autistic participants talked about their desire to connect with NT individuals, while NT participants did not reciprocate these sentiments—i.e., NT people did not mention actively not wanting to interact with autistic people, nor did they express explicit desire for such interactions. These results appear to be consistent with previous research findings, identifying the difficulty that autistic and NT individuals have in connecting with one another (Chevallier et al., 2012; Milton, 2012; Williams, 2021). Although connection was an important theme across both groups, it appeared to be on the forefront of autistic participants’ minds, possibly because social connection with NT persons doesn’t come as easily or as often and/or may be puzzling to them in a world that is dominated by NT norms (Fletcher-
Watson & Bird, 2020; Murray et al., 2022). This observation also suggests that there is an element of social privilege at play in the autistic–NT dynamic. That is, because NT people are in the majority, they set the norms, have plenty of other NT people with whom to interact, and are not necessarily compelled by social structure to interact with autistic people. The opposite is true for those on the spectrum, in that they are constantly brought into contact with NT people and their constructed social norms (Nicolaidis et al., 2019; Williams, 2021). The themes we discovered in participant interview data are nested within these general findings. Throughout the rest of the current article, the similarities and differences between autistic and NT participants are highlighted through direct comparisons of interview quotations of autistic and NT participants discussing social, environmental, and personal factors.

Theme 1: Similar Social Factors Impact Comfort Level in Autistic and NT Individuals

Autistic and NT participants alike were impacted by a variety of social factors, which greatly impacted participants’ level of comfort within a given environment. The degree and/or frequency to which these social factors impacted participants varied between autistic and NT individuals. We will discuss the findings related to the social factors that contribute to comfortable and uncomfortable environments for participants, by highlighting each subtheme and its converse. We extracted three main subthemes within social settings that impact participants’ comfort within their environment. These subthemes include: desire for connection/discomfort with being different; the impact of social expectations, pressures, and judgment; and how the familiarity of social factors influences comfort level.

Subtheme 1: Desire for Social Connection and Discomfort of Being Different

We observed a desire for connection through statements associated with codes, such as having the ability to be vulnerable and open, empathizing, relating, expressing thoughts, feeling
a sense of belonging, feeling validated and supported, feeling loved and protected, and feeling the friendliness of others. Throughout these statements, autistic individuals expressed a deep desire to connect and be loved by others. In relation to this notion, two autistic subjects commented:

I tried for a really long time to act like I don’t care and I don’t need the social connection and I’m like better on my own, but I’m not…. I feel like it’s something that I need and something that I want so so bad is to fit in with other people and have close relationships with other people. But there’s something fundamentally different about me that prevents me from having that, and I’m scared that other people can see it. (Interview DEP012, Quotation 1)

We just want to be known and not affect anybody else. We’re not really all that different, we’re the same. The things that you want and the reason why we’re here … I want someone to take the time to get to know me too. (Interview DEP007, Quotation 2)

While NT participants did not express this desire/need to connect with others at the same level, they frequently commented on the comfort they felt within a family structure, and a desire to spend time with others. One NT male commented, “That common trait of being a part of a family is a thing that brings you together. And in that way, trumps all other like influences” (Interview DEP005, Quotation 3). A NT female talked about the importance of dedicating time to her friends and family amidst daily tasks by stating, “I think most of my focus and energy would be on them because it’s like very limited time in my week that I can, like, focus on people” (Interview DEP003, Quotation 4). Based on these findings, connection is also highly valued by NT individuals, however they do not seem to long for it in the same way that autistic individuals do.
Within these quotations, autistic individuals highlighted the concept that all share similar desires to be known and to be loved (Dwyer, 2022; Murray et al., 2022). Autistic individuals—typically in the minority—often lack connection and acceptance from those in the majority (i.e., NT individuals). This dynamic frequently leads to marginalization of autistic people (Mitchell et al., 2021). This marginalization appears to be associated with autistic individuals longing for connection with others, as seen in the co-occurrence of codes being/feeling different, connection, and a desire for social interaction. Based on this finding, it is likely that the autistic population feels the impacts of the double empathy problem more acutely than the NT population (Baron-Cohen, 2022; Chown, 2014; Milton, 2012; Milton et al., 2022; Mitchell et al., 2021). On the other hand, though probably less perceptible, the entire population may experience serious repercussions of the double empathy problem, not benefitting from the unique perspectives and solutions to problems that autistic people might offer. Furthermore, there are more personal ways in which NT people feel the effects of the double empathy problem. For instance, an NT parent of an autistic child may experience difficulty empathizing with their autistic child, and, therefore, feel a deep longing to connect. Thus, both groups require connection to thrive.

On the topic of bonding with others, all participants shared experiences highlighting the positive impact that passing through shared ordeals with others has on their ability to empathize. For example, one autistic male participant shared his experience touring his current living facility—a residential program for autistic adults—for the first time. He talked about the comfort that relating to others brought him while in an otherwise uncomfortable situation:

Okay this is an uncomfortable situation…. There are people here who are—have the same problem to a point, you know, they have similar things that I have and they just
want to help. And so … knowing that form of kindness, you know … that helped me.

(Interview DEP008, Quotation 5)

Another autistic male participant shared a similar thought regarding the value of relating with others while in a shared uncomfortable setting. He stated that he would want to participate in conversation with those around him in order to establish “shared empathy over the horrible experience [they’re] in” (Interview DEP009, Quotation 6).

Similarly, one NT male participant expressed the same desire to relate with others over shared experiences of discomfort by stating, “I think there’s an element of discomfort for both people, so we can kind of just have fun, relate on that, enjoy our time together” (Interview DEP001, Quotation 7). Another NT male commented on the value of going through similar experiences to build relationships with others:

Being able to be relatable, you know, in the same boat or whatever. We’re all in college, or we all have a hard class, or we’re all going on first dates or whatever it is. And then just being able to be vulnerable with each other, open up, and then have trust too.

(Interview DEP001, Quotation 8)

Autistic individuals’ desire to relate to others while in uncomfortable environments illustrates their desire and ability to empathize with others. In fact, sharing trials may serve to align people.

Relating is a form of empathy (Fletcher-Watson & Bird, 2020). Previous findings show that relating (i.e., cognitive empathy, theory of mind, etc.) is more easily accomplished between those who are cognitively similar to each other (Milton et al., 2022; Nicolaidis et al., 2019; Williams, 2021). Peoples’ “cognitive environments” are built upon both cognitive styles and experience (Williams, 2021). Difficulties, when shared across group members, may act as a
particularly strong bonding agent. Consistent with this notion, throughout our interviews, autistic participants frequently talked about their experiences relating to other autistic individuals across the lifespan. Although NT and autistic participants shared fewer instances of relating with each other, all participants reported that relating with others brought comfort within an environment. We propose that this common desire to engage in conversation and relate to one another on shared experiences can be utilized to build understanding and empathy between individuals who experience their environments differently (Murray et al., 2022).

On the other side of the social connection spectrum, NT and autistic participants alike commented on the discomfort they feel when they feel different than others in a social setting. All autistic participants expressed themes of feeling and/or being different than those around them. Many of these participants shared an acceptance of their place as fundamentally “different” or “weird.” These feelings were often tied to matters surrounding isolation and disconnection, feeling alone, and even dehumanization. Although all participants shared discomfort with being seen as different, autistic individuals’ experiences, again, differed in degree and frequency. For example, an NT female expressed discomfort in the context of being dressed differently than everyone else in a social setting. She said, “I feel like just the fact that I’m different than everyone else, you don’t like … fit in” (Interview DEP004, Quotation 15). An autistic female expressed similar discomfort to being different, but to a far greater degree by stating, “I guess sometimes as a neurodivergent individual, I sometimes get the feelings that I’m kind of a stranger in a world that wasn’t really made for me” (Interview DEP011, Quotation 16).

Many autistic participants expressed feelings of isolation from the majority of society. They often felt misunderstood when trying to connect with others (Chevallier et al., 2012; Mitchell et al., 2021). An autistic female stated, “I feel like there’s always this spotlight on me,
because people can tell when something is different with you, especially socially. People can sense, like, something is ‘wrong’ with you and I always feel like I mess up” (Interview DEP012, Quotation 17). An NT female shared a similar experience of being misunderstood and isolated from others, in the context of classmates discriminating against her due to her ethnicity. She said, “I didn’t feel welcomed. I felt discriminated. No one in that group really stood up for me. They all just kind of like would not look at me” (Interview DEP003, Quotation 18). These two female participants depicted settings where they’ve felt a spotlight on them because of a perceived difference, and the discomfort that accompanies that spotlight (see Figure 3). The two drawings in Figure 3 illustrate that both autistic and NT individuals sometimes feel uncomfortable in the spotlight, with others looking at them and judging them, which is associated with great discomfort. Analysis of these drawings influence the overall analysis of participants’ experiences and reactions to discomfort. Therefore, at one end of the spectrum, connecting with others brings comfort, while, at the other end, isolation and lack of acceptance is linked to discomfort. Interestingly, both autistic and NT people expressed each of these notions spontaneously within their interviews.

**Subtheme 2: Social Expectations, Pressures, and Judgment Impact Comfort Level**

Both autistic and NT individuals expressed strong desires to be their whole self without judgment from others. Social expectations and rules often caused participants to feel limited and judged. Conversely, experiencing freedom from the judgment of others allowed our interviewees, regardless of neurotype, to feel safe and comfortable. This theme is highlighted in the following quotations by first, an autistic participant, and secondly, an NT participant:

I will talk to friends, if I already have made myself comfortable, they know enough about me that I know that they aren’t going to judge me and I can feel fine, just whenever I
stumble over my words and people aren’t going to make fun of me when I know that I’m speaking incorrectly even. (Interview DEP007, Quotation 9)

I think if everyone had a good tone when they talk, and make people feel safe and not obligated with certain like, kind of giving people safeties … like in an interview if someone was like, ‘there is no right answer,’ you’re like, validated. And it’s also like, there are no present expectations that you have to guess. (Interview DEP002, Quotation 10)

Both autistic and NT individuals alike desired to live in an environment where they were free to be their authentic selves (Murray et al., 2022). Negative judgment, expectations, or rules were reported to hinder individuals’ ability to be comfortable within their environment. Autistic participants felt freedom to be their whole selves while with close friends or family, but not with less familiar people. This discomfort with interacting with less familiar people is likely due to them feeling misunderstood and different compared to the majority of society (see subtheme 1; Mitchell et al., 2021). Societal rules and expectations only ceased to impact autistic individuals when they were with those who knew them well and accepted them, even if they didn’t always comply with constructed social norms. In partial contrast, a number of NT individuals reported feeling comfortable with both familiar and unfamiliar people across settings, due to sharing similar social expectations (Chown, 2014; Milton et al., 2022). Yet, many also expressed affinity for feeling unjudged.

In contrast, many participants expressed discomfort with the social pressures and expectations placed on them during social interactions. Many found these pressures exhausting and confusing. Individuals felt a need to analyze, predict, plan, and prepare for social interactions in order to appease social expectations and fit in with others. Autistic participants expressed
feeling significant pressure from social rules and expectations, often leading to masking their natural tendencies, and having to attend or be “on” during social interactions. Autistic individuals shared many experiences of needing to analyze and predict social interactions, and their difficulties in doing so. One autistic female shared:

I’m physically incapable of understanding when someone is done speaking because my brain does not pick up on the facial or body signals that people use when they’re done, so I’m just guessing all day when someone has finished talking and it’s miserable for me.

(Interview DEP012, Quotation 19)

All individuals use their understandings of social rules, body language, context, etc. to predict how a social interaction will unfold. It is often difficult for autistic individuals to make predictions during social interactions, as they are often trying to read the cues of individuals who may have different cognitive, empathic, processing (sensory and otherwise), and/or social styles than them (Chapple et al., 2021; Williams, 2021). However, social interactions are dynamic and NT and autistic individuals alike shared feelings of discomfort with analyzing and predicting how social interactions would unfold. An NT female shared her feelings of stress when preparing to enter a social setting. She said, “I feel like I prepare myself for very specific circumstances. Like I like to know what I’m doing before I go someplace. And like, who’s there? What’s the situation like?” (Interview DEP002, Quotation 20). Both autistic and NT participants shared similar experiences of analyzing social scenarios, though autistic participants expressed greater difficulty in the correct analysis and prediction of those social scenarios. For example, an autistic female participant shared, “When I talk to other people, I can’t tell if they’re uncomfortable or not. That’s like, actually like I said. It’s the blurry faces I have no idea. I’m sure they do though”
The task of analyzing and predicting social interactions appeared to be more difficult and daunting to autistic individuals.

Even though reading others’ social cues and making accurate predictions based on these signals may be difficult for some, many mask their natural tendencies in order to fit within social expectations and rules (Corbett et al., 2020). As such, masking shows understanding of social patterns. An autistic female shared that she feels the most pressure to mask in front of new people, or in groups of people:

I think the best example of me being as highly masked as possible would be like a party or in public, and having to talk to someone I don’t know. Then the full masking face goes on of like, ‘Um, yeah. Okay. Yeah. I understand that’…. If I’m in one of those places for very long I get really tired. I tend to get migraines. It increases my anxiety. (Interview DEP010, Quotation 22)

Although NT participants shared some similar themes of needing to analyze and attend to conversation, autistic participants shared having to mask their natural tendencies and feelings to fit social expectations more frequently than NT. As reported in the quote above, this causes feelings of exhaustion and anxiety for these individuals.

Autistic and NT individuals alike reported being negatively affected by social rules and expectations. However, autistic individuals reported experiencing more anxiety and stress related to those social expectations, as they find it difficult to correctly guess and fill those expectations. These reports from participants are consistent with the predictive coding theory of autism that explores why autistic individuals may exhibit difficulties in formulating predictions in various social and sensory environments (Sinha et al., 2014; Van Boxtel & Lu, 2013; Van de Cruys et al., 2014). Since social interactions are often difficult to accurately predict—specifically for
autistic individuals—the social pressure to predict and respond “appropriately” causes feelings of anxiety and stress (e.g., Carleton et al., 2010; Payne et al., 2011; Van Steensel et al., 2011).

In all, autistic and NT individuals both expressed that when being oneself is in alignment with social norms, one feels comfort, while social rules and expectations can be exhausting and uncomfortable when one’s authentic self is out of sync with them. Autistic individuals encounter the discomfort of these rules and expectations to a greater frequency and degree, as the rules were constructed by a majority who is neurologically different than them (Chown, 2014; Fletcher-Watson & Bird, 2020).

**Subtheme 3: Familiarity of Social Factors Impacts Comfort Level**

Familiarity, and its relationship to comfort, was a very common theme for all participants across social and environmental factors. Participants expressed feelings of comfort when interacting with individuals they knew well. In fact, several participants stated that having one familiar person present with them would positively impact their ability to participate in an otherwise uncomfortable social setting. Perhaps most notably within our sample was that participants of all neurotypes shared feeling comfortable specifically with their families. For instance, an autistic female participant mentioned, “I feel really safe with my parents” (Interview DEP012, Quotation 11). Similarly, an NT female participant expressed, “I just feel really comfortable and happier when I’m with my family, that’s probably when I’m the most relaxed” (Interview DEP004, Quotation 12).

Multiple participants also commented on feeling comfortable while with a highly familiar individual, such as a significant other. One autistic female commented:
The closer I am to someone, the less I feel like I need to [mask]. So like, with my boyfriend, he’s also autistic. He is maybe the only person on earth that I am comfortable being fully unmasked in front of. (Interview DEP010, Quotation 13)

Similarly, an NT female commented, “I feel emotionally comfortable because my boyfriend is there” (Interview DEP002, Quotation 14).

Many of our autistic participants mentioned the need to “mask” or “camouflage” their natural tendencies due to social expectations and pressure (Hull et al., 2017). It is now well-known that camouflaging negatively impacts individuals’ self-esteem and mental health (Bradley et al., 2021). The main motivation individuals have for camouflaging their natural tendencies is to increase their social and emotional connections with others. Since, in order to mask, someone might need to intuit the expectations, thoughts, feelings, etc. of others, camouflaging could be seen as a form of empathy (Corbett et al., 2020).

Both groups expressed being positively impacted by familiarity of social factors. Interactions with family members, significant others, and close friends all helped create comfortable environments for all participants. Many autistic participants shared experiences of feeling comfortable when with familiar friends and family who are likely NT. This suggests that given effort and time, NT and autistic people can connect well and become comfortable with each other in social settings. This comfort and familiarity is likely created in a space where both autistic and NT individuals feel accepted and understood.

Conversely, a lack of familiarity of social characters heavily influenced individual’s discomfort within an environment. Both NT and autistic participants shared similar discomfort when interacting with strangers, less familiar individuals, or conversing about an unfamiliar topic. Although they shared similar feelings, they again experienced these feelings to differing
degrees/severities (see Figure 2). For example, while NT participants express some discomfort with unknown social interaction with strangers, autistic participants express an intolerance to participating in those interactions. NT participants stated things including, “If they’re strangers, I’d be pretty uncomfortable,” and, “Being in environments where I don’t know people is stressful” (Interview DEP003, Quotation 23). NT participants expressed feeling fairly uncomfortable, or feelings of stress towards the social interaction. While autistic participants stated, “I don’t order for myself at restaurants if I can help it. Like, that’s how uncomfortable it makes me. Because I don’t want to do it, I don’t. I hate doing it,” and, “Leave me alone. I don’t understand people who wanna talk on airplanes, like, that’s so not who I am. Don’t speak to me…. Stop talking to me” (Interview DEP012, Quotation 24-25). Autistic individuals expressed a greater disinterest and discomfort in participating in unfamiliar and unwanted social interactions (see Figure 2). This finding is likely tied to the effort it requires for them to correctly analyze and respond within social interactions. Autistic individuals’ difficulty in the prediction of unfamiliar NT social factors likely causes them to feel a fear of judgment and disapproval, contributing to their discomfort in interacting with unfamiliar—and unpredictable—people.

**Theme 2: Environmental Factors Influence Comfort Level in Autistic and NT Individuals**

The physical environment directly impacts individuals’ levels of comfort and discomfort in any given scenario. Based on findings from interviews, there are two main subthemes of environmental influences that strongly impact individuals’ experience within their environment. These subthemes include familiarity/predictability of the environment and sensory factors (e.g., auditory, visual, tactile input, and processing).
Subtheme 1: Familiarity and Predictability

Similar to the trends of familiarity within social interactions, many participants shared the importance of familiarity and predictability within their physical environment. Both autistic and NT participants shared similar feelings of its impact on their experiences. When asked what factors predict how comfortable he feels in his environment, one autistic male said, “I guess how expected something is. Cause a lot of my uncomfortable experiences are like mostly unplanned. It’s like, I went in expecting one thing and found myself in something else” (Interview DEP011, Quotation 26). Similarly, when asked what causes feelings of discomfort within an environment a NT female participant stated, “I just say like most new circumstances, even if I know it’s going to be safe, there is a level of uncomfortableness because it’s unknown. And so, I just get a little bit nervous I would say” (Interview DEP002, Quotation 27). Both autistic and NT participants shared that familiarity is one of the key factors in predicting how comfortable or uncomfortable their environment is.

This finding is consistent with previous research findings stating that routine and familiarity of environmental factors are preferred across the human spectrum (Murray et al., 2022). Although familiarity was a theme across groups of participants, a break in routine or an unfamiliar scenario impacted autistic individuals to a greater degree than it impacted NT individuals. While NT individuals were “thrown off” or “nervous” about unfamiliar settings, autistic individuals felt stronger feelings such as overwhelm, fear, confusion, and exasperation (Boulter et al., 2014; Cardon & Bradley, 2023; Cardon et al., 2023; Hodgson et al., 2017; Neil et al., 2016; Van de Cruys et al., 2014; Wigham et al., 2015). These findings support the notion that NT and autistic individuals differ in degree/frequency rather than type of factors leading to comfort and/or discomfort (see Figure 2).
Subtheme 2: Sensory Balance and Sensory Seeking/Overload

Autistic and NT participants reported similar experiences involving comfortable sensory factors. These factors included situations such as being at home, outside, in a quiet environment, or being physically comfortable on a bed or couch, using soft blankets, and comfortable temperatures. One NT male talked about one of the reasons why he feels comfortable at home with his wife. He commented on the sounds within the environment by stating, “We might just like sit there, and we’re just quiet. We’re not trying to think about anything, there’s no objective, it’s just … we’re there. And to me, that is very Zen. Peaceful” (Interview DEP005, Quotation 28). An autistic female made a similar comment, stating that she would love to live in a quiet open space far away from others:

I think English countryside is almost idyllic for me in the sense that there’s space and you’re close to the earth. You have trees and you have fields. It’s not all these concrete buildings … like wide open spaces that I can have as my own to do whatever I want in it. (Interview DEP007, Quotation 29)

Generally, autistic and NT participants shared similar ideals of sensory environments. Both preferred quieter environments, being outside in aesthetically pleasing places, and being in their home with their special/familiar belongings. Although both groups overlapped in comfortable sensory factors, autistic individuals seemed to have a smaller comfort range/threshold (see Figure 2). In our sample, sensory factors more quickly and frequently created discomfort for autistic participants, while NT subjects seemed less affected in general (Posar & Visconti, 2018; Wigham et al., 2015; Williams, 2021). However, since sensory processing difficulties vary across the spectrum of humanity (Cardon et al., 2023; Murray et al., 2022), there must be sensory overlaps upon which autistic–NT understanding can be built.
Many NT participants stated that environmental factors would not draw their attention unless something was extreme or surprising. Many of these participants reported that sensory factors could be annoying, unwanted, and occasionally impactful enough to cause discomfort within their environment. An NT female shared, “sometimes the lighting is a little bit annoying … but yeah it doesn’t really affect me” (Interview DEP004, Quotation 32). While another female participant commented on how loud sounds could add discomfort within her environment by saying, “Maybe if there’s like music really loud playing. I’d be like, ‘Turn that down so we can actually talk’” (Interview DEP006, Quotation 33).

Many autistic participants’ sensory experiences exhibited far greater severity and frequency than those of NT participants (Chevallier et al., 2012). For example, one autistic female demonstrated this point when she said:

I feel like, like there’s a fire alarm in my brain…. Like all my bones are turned on to fight mode and I can feel everything in my body and my hair is touching my neck and my clothes are sitting wrong and all of that, and all of that sensory input. Like, I don’t feel pain or temperature because my body is already so focused on clothing and sounds that to add more to that, like it shuts everything down. Like, I can’t think anymore. I can’t talk. I can’t do anything because my brain is so hyper focused on how everything is feeling and sounding. (Interview DEP012, Quotation 34)

This individual’s experience is consistent with the current research about sensory processing and attention in autistic individuals, such as the theory of monotropism. This theory talks about the hyper-focus and narrow attention tunnel that autistic individuals often experience when processing sensory information (Dwyer et al., 2024).
Another autistic female highlighted another aspect of sensory processing that is more common in autistic people by sharing her experience of sensory overload. When asked to draw an environment or setting where she feels uncomfortable, she replied that she feels uncomfortable “everywhere.” As she sketched out her experience, she shared (see Figure 4):

Sensory processing overload. It could be that, it could be just pure overwhelmed. Could be burn out. It could be any sort of bad thing. But you just feel everything so intensely. For me, it’s like knives in my chest that are just grabbing me and just slicing me right through or like these giant hands that are just reaching and clawing on me…. It just forces you to crawl and just pushes it ‘til you’re literally in the fetal position … eventually you just end up curled up in the fetal position on the floor, and it’s sharp and spiky because they’re sharp bits of pain. But then it also comes out in waves. And it just keeps going and going and going and there’s nothing you can do except just wait it out and hopefully there’s an end. (Interview DEP007, Quotation 30)

Given the same verbal prompt, an NT female drew and described an environment where she felt uncomfortable (see Figure 4). She described the image by saying:

I was on my period and my body hurt so bad and I was super uncomfortable. Just like, my stomach gets all icky and stuff. And it was super boring…. So, I was just feeling super awful, couldn’t pay attention, which also sucked because I’m there, I might as well learn something, but I’m not learning, so then I’m getting behind. It’s super boring and my body hurts, and I just want to leave. (Interview DEP002, Quotation 31)

Similarities can be found within these participants’ experiences, as well as the artistic depictions of these scenarios. The artwork created contributed to the interpretation of these individuals’ sensory reactivity to various settings. While the contexts the above participants
described were very different, the emotional and somatic responses were similar. That is, they were both negatively impacted (i.e., felt pain) by sensory factors, though there is a stark contrast in the severity and cause of the discomfort between these participants. Atypical sensory processing may contribute to the reported difference in how NT and autistic participants experienced their environments. Autistic individuals who experience atypical sensory processing often experience hyper and hypo sensitivities, as well as sensory-seeking tendencies, that cause them intense feelings of pain, confusion, anxiety, etc. (De la Marche et al., 2012; Marco et al., 2011; Tomchek & Dunn, 2007). Although autistic individuals’ responses to sensory stimuli are “atypical,” NT individuals may gain some understanding of them by considering their own responses (i.e, feelings of pain, confusion, anxiety, stress, etc.) to stimuli in various settings. While NT individuals may not feel those same things to the same degree, many of them do have sensory sensitivities that cause some level of discomfort. By drawing on their own experiences of discomfort, they may be able to better understand the autistic experience. Interestingly, both the autistic and NT females symbolized their discomfort with the color red and wave-like shapes in their drawings (see Figure 4). Despite the difference in context and degree of each person’s experience and their differing neurology, the similarities of their feelings could hypothetically be used to facilitate empathy between these two people.

**Theme 3: Personal Factors Impact Comfort Level for Autistic and NT Individuals**

**Subtheme 1: Control and Predictability**

Having a sense of control and predictability within an environment directly impacted autistic and NT participants’ emotional wellbeing. This finding was consistent with statements above, indicating individuals’ strong preference for predictability and sameness in both social and environmental settings (Goris et al., 2019). Throughout the interviews, there were multiple
instances of co-occurrence of the codes feeling safe and having control. One NT female shared, “I think that my home is a safe place, but I think that I made it a safe place because I’m just very hypervigilant” (Interview DEP003, Quotation 35). This participant shared feelings of comfort and safety in her home, because she had the control to make it that way. An autistic female shared a similar experience, with more emphasis on the predictability of her home. She said, “Our house growing up, it’s like laminated schedules on your door and in the bathroom … keeping that sense of security is really important” (Interview DEP012, Quotation 36).

A sense of control and routine created a comfortable environment for NT and autistic participants alike. One NT female commented on the importance of routine:

I feel like I have like a routine of what, like, I do every day if that makes sense. And so like, changing something in the routine, even though it’s not a crazy big deal. I feel like, woah. Like, this isn’t normal. (Interview DEP004, Quotation 37)

Both NT and autistic participants share similar desires for predictability and control within their environment. Each expressed an intolerance of uncertainty in social and physical environments, and the negative impact that uncertainty has on their emotional wellbeing (Cardon & Bradley, 2023; Jenkinson et al., 2020).

On the opposite end of the spectrum, a lack of control brought autistic and NT participants discomfort within their environments. A lack of control was often connected to codes including feeling powerless, defenseless, bored, and wasteful. An autistic female shared an experience of when she felt a lack of control over her body’s feelings and sensory processing. She shared that once she has experienced sensory overload, “at this point, it’s a lost cause. There’s absolutely nothing you can do or anyone can do” (Interview DEP007, Quotation 41). An NT female, on the other hand, shared an experience of discrimination in the classroom where she
had an external lack of control. She said, “I feel like I don’t have a lot of power. So, I think that’s probably the main theme… I was definitely not in the position of power or control” (Interview DEP003, Quotation 42). Autistic individuals may feel an internal lack of control more frequently than NT individuals, based on their differences in sensory and emotional processing. Emotional processing and regulation difficulties likely contribute to autistic individuals’ internal feelings of lacking control, as they feel unable to regulate their emotions within a given environment (Laurent & Rubin, 2004). Sensory and emotional processing are highly intertwined, as both likely cause difficulties for autistic individuals to feel in control of themselves and their surroundings. Although each faced different sources of discomfort (i.e., internal and/or external factors), both groups expressed similar feelings when they lacked control.

**Subtheme 2: Desire and Pressure to Make Personal Improvement**

Several participants from both groups expressed an innate desire to improve and progress throughout their lives. Each group expressed feelings of comfort in settings where they were free to explore, learn, and grow freely without judgment. One NT male shared why he feels comfortable cooking in the kitchen with his wife:

> Part of it is just feeling like it’s a place [where] I spend a lot of time learning and growing my skills. And it’s a place that—it’s not promised that it turns out good. We’re always trying new things and that’s kind of a fun place to be. (Interview DEP005, Quotation 38)

An autistic male shared similar feelings by stating, “I like learning new things, growing, and becoming better” (Interview DEP009, Quotation 39). Autistic and NT individuals shared an internal desire and pressure to improve themselves. An autistic male shared that if the pressure comes from an external force, it is no longer constructive. He said:
If I learned something about that myself, internally … I guess it’s more of an internal than an external forcing-upon-me kind of thing. Internally, I’m fine learning to grow and change, but if someone’s like, ‘You will change like this!’ It’s very tiring, very fast.

(Interview DEP009, Quotation 40)

Historically, autistic individuals have been treated using a medical model aimed to change and modify their interactions (Corbett et al., 2020). Based on the present findings from autistic participants, external forces pressuring them to change is most often not constructive and may even be counterproductive, or worse. The autistic individuals in the current study contained the same desire as NT individuals to improve themselves. Our findings suggest that interventions and approaches to support autistic people may be more successful by using less external pressure (i.e., telling autistic people what they’re doing wrong and what they need to do) and capitalizing more on the intrinsic desire that they have to improve themselves (i.e., focus on their strengths and weaknesses that they see fit; Burnham Riosa et al., 2017).

An innate desire to improve and grow, however, can quickly become a discomfort when one adds excessive pressure onto oneself. Autistic and NT participants both shared that they held themselves to high standards and that they’re often their harshest critic. One NT female stated, “I definitely hold myself to a higher standard…” (Interview DEP004, Quotation 43). Similarly, an autistic male shared, “I know intellectually that I care about myself way more than anybody else does, and I’m critiquing myself way more than anyone else is” (Interview DEP012, Quotation 44).

An overpowering intrinsic pressure to improve can cause feelings of inadequacy and discouragement (Kawamura et al., 2001), especially for those individuals who are also facing
repeated opposition from external forces (Greenaway & Howlin, 2010). An autistic female highlighted this point well, by sharing the difficulty of feeling like her efforts are never enough:

That’s kind of like, one of the things. You’re living in a world that’s not designed for you, no matter how hard you try, your efforts are just not enough over and over again.

And it makes you wonder why the rates of suicide are so high among the autistic population—especially in females. Because … nobody’s being able to accommodate any of your needs … you’re not even having your basic needs met to be loved, to be understood, to be taken care of. (Interview DEP007, Quotation 45)

Both internal and external pressures to improve are essential to an individual’s progression (Vansteenkiste et al., 2006), however, an excess of these pressures can have significantly negative effects on individuals (Kim, 2018). Many autistic individuals likely feel a conflict between these two pressures, with internal pressures pushing them to be their whole selves, and external pressures (i.e., social rules/expectations) pushing them to mold and change themselves in ways that feel unnatural to them. These pressures can be debilitating to this population, and likely factor into feelings of inadequacy and isolation, as well as the higher rates of suicide in the autistic population (Cassidy, 2020; Cassidy et al., 2018; Pelton et al., 2020).

Although NT individuals likely experience some conflict between what’s in them and what’s expected of them, autistic individuals experience higher levels of conflict between these pressures, causing them to feel more discomfort within social environments.

**Reactions to Discomfort**

Autistic and NT participants reported a spectrum of reactions to discomfort. Each individual provided unique ways that discomfort impacted their speech, thoughts, and body. Although NT and autistic individuals demonstrated like reactions to discomfort, autistic
individuals generally reported more adverse and extreme reactions to discomfort. For example, one NT female reported that when in an uncomfortable environment she felt, “a little bit shaky and cold, just kind of like choking. Not physically choking, but [she] wasn’t as eloquent with [her] words, and nothing felt as natural” (Interview DEP002, Quotation 46). An autistic female reported a similar reaction, but to a differing severity/degree by sharing, “Yeah, like you know how you stumble over your words sometimes when you’re really nervous? Yeah. Imagine that, but like, you can’t talk at all” (Interview DEP010, Quotation 47).

Although NT participants did report some sensory strategies while in an uncomfortable environment, autistic participants reported relying more on sensory strategies to cope in uncomfortable environments. These strategies included codes such as fidgeting, phone usage, stimming/repetitive behaviors, music, and special items. Many of these strategies were mentioned across groups of participants. For example, a NT female stated, “Usually I have a hair band on my wrist…. I usually fidget with that if I nervous” (Interview DEP003, Quotation 48). Similarly, an autistic male commented, “You know, probably if I didn’t have the fidget, I would be like … I’d be moving back and forth and back and forth” (Interview DEP008, Quotation 49).

Many sensory strategies were shared between groups, however, the frequency in usage of sensory strategies greatly differed between groups. Due to higher levels of sensory discomfort in autistic individuals, they reported using sensory strategies to cope more frequently than NT. Based on the interview findings, it is predicted that autistic individuals likely have more adverse and severe reactions to discomfort compared to NT individuals. This is likely due to atypical sensory processing and social communication difficulties that heighten autistic individuals’ reaction to discomfort within a given environment.
Limitations

This study is limited in its scope due to limited sample size of participants, and the population sampled, though our sample size is typical of many qualitative studies (Chapple et al., 2021; Murray et al., 2022). Still, the generalizability of our findings should be treated cautiously. Limitations also included variability in participants’ autistic diagnosis. Many autistic participants were college students with relatively low support needs and, thus, did not represent all types of young autistic adults. Furthermore, all but two participants resided in the state of Utah and were predominantly White. While these demographics matched the area where the study was conducted, future studies would do well to include samples with greater racial and ethnic diversity. There were also differences in the familiarity participants had with the interviewers based on previous interactions, which constituted a limitation. Although researchers made efforts to equally represent all participants’ direct quotations in the study’s results section, it should be noted that autistic females were more expressive throughout the interviews, and therefore provided more quotations overall, as well as those specifically tied to the target questions. Autistic and NT females shared more emotionally salient expressions regarding their experiences within different environment, although similar themes were found across the male participants.

Future Directions and Implications for Parents, Clinicians, and Other Stakeholders

Based on the findings of this study, future research can be done exploring how autistic and NT individuals experience other aspects of life, outside of comfort and discomfort. Examining overlaps and differences across various aspects of life may improve society’s understanding of autistic people. Studies using wider sample populations can be done to for better generalization of findings. Researchers may also continue to explore other mediums to build empathy between autistic and NT individuals, and evaluate how increased empathy
between autistic and NT groups benefits both the minority (i.e., autistic population) as well as the majority (i.e., NT population). Future interventions and treatment approaches can be developed based on this study’s findings of autistic individuals’ experiences in social and physical environments. Using the artwork created within this study, researchers may continue to explore the potential that artwork has to build understanding and empathy between different groups of people.

The current study’s implications extend to various stakeholders, offering valuable insights for both parents and clinicians. For parents, understanding that their children with autism share many desires and experiences with NT individuals is crucial, since many parents of autistic children are non-autistic. Similarities in what brings comfort or discomfort should be recognized, with the acknowledgment that autistic individuals navigate these factors within a world not necessarily accommodating to them. For clinicians, it’s imperative to recognize that autistic individuals are not inherently flawed and do not require fixing. Rather, they are unique individuals within the broad spectrum of humanity (Maynard, 2024), each with their own strengths and weaknesses. Treatment approaches should focus on building these strengths while providing support to navigate areas of difficulty, helping individuals thrive in a predominantly NT world.

**Conclusion**

This study investigated the intersections of thinking, feeling, and reactivity to fundamental human experiences among NT and autistic individuals, uncovering shared commonalities and distinct differences. Through thematic analysis of personal interviews, we identified three overarching themes—social, environmental, and personal/emotional factors—that influence comfort and discomfort across both groups. Autistic and NT individuals shared
many of the influences/causes of comfort and discomfort. However, autistic individuals differed primarily in the frequency and severity rather than the type of these factors compared to NTs. Notably, autistic participants emphasized their desire to be seen and accepted by NTs, highlighting the challenges of navigating a world potentially ill-suited to their neurodiversity. These findings offer nuanced insights into the double empathy problem, demonstrating the similarities each of us share, as well as highlighting the challenges and desires that autistic individuals encounter living within a majority NT society.

The parallels observed in the factors influencing comfort and discomfort hold promise for fostering empathy between autistic and NT individuals, and for facilitating a deeper understanding of the diverse experiences shaping the world around them. These findings carry profound implications for parents raising autistic children, clinicians tasked with diagnosing and treating autistic individuals, and all who engage with autistic individuals in various capacities. By acknowledging and comprehending shared experiences, both autistic and NT individuals can gradually recognize the fundamental similarities that bind us, realizing that what brings us comfort or discomfort likely resonates with others as well. Moreover, embracing conversations about our differences serves as a catalyst for empathy, fostering appreciation for the challenges autistic individuals face, including heightened sensory sensitivities and social navigation difficulties in a predominantly NT society.
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Figures

Figure 1

Themes and Subthemes Causing Comfort/Discomfort

Note. This figure breaks down each of the themes and subthemes causing both comfort and discomfort across interviews. The three main themes are shown in blue. The subthemes are then broken down into comfort (yellow) and discomfort (orange) categories. All themes and subthemes causing comfort and discomfort were shared across all participants (i.e., both autistic and neurotypical participants).
Figure 2

*Impact of Subthemes on NT and Autistic Individuals*

<table>
<thead>
<tr>
<th>COMFORT</th>
<th>Possible range of empathy building</th>
<th>DISCOMFORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Familiarity</td>
<td></td>
<td>Lack of Familiarity</td>
</tr>
<tr>
<td>Lack of Expectation / Judgement</td>
<td></td>
<td>Social Expectations / Pressure to Adapt</td>
</tr>
<tr>
<td>Desire for Connection</td>
<td></td>
<td>Feeling and/or Being Different and Feeling Isolated</td>
</tr>
<tr>
<td>Sensory (Balanced / Pleasant)</td>
<td></td>
<td>Sensory (Overload)</td>
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<tr>
<td>Having Control / Predictability</td>
<td></td>
<td>Lack of Control / Trapped</td>
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<tr>
<td>Desire to Improve / Progress</td>
<td></td>
<td>Intrinsic Pressure on Self</td>
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</table>

**Note.** This figure represents the impact of each subtheme on the autistic and NT participants’ level of comfort in their environment. It is based on the analysis of participants’ direct quotes and frequency of those quotes within the interviews. For example, the span of the bars represents how significantly that population is impacted by that factor (i.e., each of the subthemes). Since autistic participants reported greater degree and frequency of sensory overload, their bar spans farther towards “Sensory (Overload)” under the discomfort section. Each of these bars were created as a visual representation of the participants’ direct quotations and experiences with each of the subthemes. Bars within the chart were not created based on exact measurements or numbers within the data, but rather are to be used as a visual aid to the findings shared in the results section.
Figure 3

**Autistic and NT Females in an Uncomfortable Environment**

*Note.* These drawings were done in response to the prompt, “Draw a setting where you feel uncomfortable.” On the left, an autistic female drew a social setting where she feels like a spotlight is on her because she is “different” and stands out. The individuals around her have squiggly faces, indicating that she’s not sure how they’re feeling or how to read their facial expressions. On the right, a NT female feels uncomfortable while giving a presentation to a group of people who are judging and critiquing her. The yellow beam symbolizes the spotlight that she feels is on her in this setting. The judges’ faces are unfriendly looking, as she feels judged by them.
Figure 4

Autistic and NT Females in an Uncomfortable Environment

Note. These images were drawn in response to the prompt, “Draw a setting where you feel uncomfortable.” On the left, an autistic female depicted her experience of sensory overload. She described the complete overwhelm that her entire body feels by drawing the waves of sensory input, the harsh red and black spikes, and the knives and hands cutting and pushing down on her. On the right, a NT female drew her experience in a college classroom, where she was experiencing pain from her menstrual period, as well as feeling bored and trapped due to the time.
APPENDIX A

Consent/Institutional Review Board Approval Letter

Memorandum

To: Garrett Cardon
Department: BYU - EDUC - Communications Disorders
From: Sandee Aina, MPA, HRPP Associate Director
Wayne Larsen, MAcc, IRB Administrator
Bob Ridge, Ph.D., IRB Chair
Date: July 14, 2023
IRB#: IRB2023-202
Title: Understanding and Improving Autistic-Neurotypical Empathy Through Science and Art

Brigham Young University’s IRB has approved the research study referenced in the subject heading as expedited level, categories 6 and 7. This study does not require an annual continuing review. Each year near the anniversary of the approval date, you will receive an email reminding you of your obligations as a researcher. The email will also request the status of the study. You will receive this email each year until you close the study.

The IRB may re-evaluate its continuing review decision for this decision depending on the type of change(s) proposed in an amendment (e.g., protocol change that increases subject risk), or as an outcome of the IRB’s review of adverse events or problems.

The study is approved as of 07/14/2023. Please reference your assigned IRB identification number in any correspondence with the IRB.

Continued approval is conditional upon your compliance with the following requirements:

1. A copy of the approved informed consent statement and associated recruiting documents (if applicable) can be accessed in iRIS. No other consent statement should be used. Each research subject must be provided with a copy or a way to access the consent statement.
2. Any modifications to the approved protocol must be submitted, reviewed, and approved by the IRB before modifications are incorporated into the study.
3. All recruiting tools must be submitted and approved by the IRB prior to use.
4. All data, as well as the investigator's copies of the signed consent forms, must be retained for a period of at least three years following the termination of the study.
5. In addition, serious adverse events must be reported to the IRB immediately, with a written report by the PI within 24 hours of the PI's becoming aware of the event. Serious adverse events are (1) the death of a research participant; or (2) serious injury to a research participant.
6. All other non-serious unanticipated problems should be reported to the IRB within 2 weeks of the first awareness of the problem by the PI. Prompt reporting is important, as unanticipated problems often require some modification of study procedures, protocols, and/or informed consent processes. Such modifications require the review and approval of the IRB.
APPENDIX B

Instruments: Interview Guide

Interviewer: “I’m going to ask you to create two drawings. First, I would like you to draw a scenario where you feel comfortable.”
- “Please tell me more about this drawing. What parts of this scenario make you feel comfortable?” (Take notes on their comments/explanations)
- “So you’ve said that ___ makes you feel comfortable in this environment, is that correct?” (double check that you’ve interpreted their drawing correctly)

“Now I would like you to draw me a scenario where you feel uncomfortable.”
- “Please tell me more about this drawing. What parts of this scenario make you feel uncomfortable?” (Take notes on their comments/explanations)
- “So you’ve said that ___ makes you feel uncomfortable in this environment, is that correct?” (double check that you’ve interpreted their drawing correctly)

Interviewer: “I’m going to walk you through a setting. I’ll ask you to identify what aspects of this setting stand out to you and impact you either positively or negatively.
Imagine that you were going in for a job interview for a job that you really wanted. You’re sitting outside of the boss’ office waiting in a line of people to interview. After a few minutes of waiting, the boss welcomes you into his office and you sit down in a chair across from him. The room is relatively quiet and simply decorated.”
- What are the first things you notice in this type of environment?
- How does this environment make you generally feel?
  - For further prompting: restate the scenario and paint the picture for them again, reask the question. (don’t provide examples of feelings– could create bias!)
- What specific things in the environment make you feel ___ (their chosen feeling)?
- Did anything within this environment help you feel comfortable?
  - If they say yes: What factors make you feel this way? What specific things (e.g., sensory inputs such as lights or sounds, social experience/expectations, etc.) caused you to feel more comfortable?
  - If they say no: What additional factors would help you feel comfortable?
- Did anything within this environment make you feel uncomfortable?
  - If they say yes: What factors make you feel this way? What specific things (e.g., sensory inputs such as lights or sounds, social experience/expectations, etc.) caused you to feel uncomfortable?
  - If they say no: What additional factors would make you feel uncomfortable?

Interviewer: “Now, I would like you to think of an environment where you’ve felt uncomfortable. I’ll give you a minute to reflect and think of an environment where you’ve felt this way.”

If further prompting is required: For example, some people have found public speaking, first dates, or a large social party to be uncomfortable environments.
- What setting did you think of makes you feel uncomfortable?
- Walk me through the environment and be sure to include the factors that are important to you (factors that impacted how you experienced the environment).
- What about this environment caused you to feel discomfort?
- Are other people involved in this environment? If so, what do those interactions look like?
  - If further prompting is required: What did they do (e.g., eye contact, body language, communication method) to influence how you felt? What about them (e.g., appearance, general presence) makes you feel comfortable/uncomfortable?
- Can you think of any additional examples of environments that have caused you to have similar feelings?

How often do you feel uncomfortable in your environment?
- Can you share some of the situations/interactions that are connected with feelings of unease/discomfort? On the same token, what are some environments that are associated with feelings of comfort and safety?
- After reflecting on various environments, what are the general factors that predict how you experience your environment?

Interviewer: “I’m going to share another setting. I’ll ask you to identify what aspects of this setting stand out to you and impact you either positively or negatively. I would like you to imagine that you are at home with your close friends or family, sharing simple conversations about your day.
- What are the first things you notice in this type of environment?
- How does this environment make you generally feel?
  - For further prompting: restate the scenario and paint the picture for them again, reask the question. (don’t provide examples of feelings– could create bias!)
- What specific things in the environment made you feel ____ (their chosen feeling)?
- Did anything within this environment help you feel comfortable?
  - If they say yes: What factors make you feel this way? What specific things (e.g., sensory inputs such as lights or sounds, social experience/expectations, etc.) caused you to feel more comfortable?
  - If they say no: What additional factors would help you feel more comfortable?
- Did anything within this environment make you feel uncomfortable?
  - If they say yes: What factors make you feel this way? What specific things (e.g., sensory inputs such as lights or sounds, social experience/expectations, etc.) could cause you to feel uncomfortable in this environment?
  - If they say no: What additional factors would make you feel uncomfortable?

Interviewer: “Now, I would like you to think of an environment in which you have felt safe and comfortable. I’ll give you a minute to reflect and think of an environment.”

If further prompting is required: For example, some people find places such as home, a library, a restaurant, or outside activity to be comfortable environments.
- What environment did you think of that makes you feel comfortable?
  - Walk me through the environment and be sure to include the factors that are important to you (factors that impacted how you experienced the environment).
  - Further prompting: What specific things about this environment makes you feel safe and comfortable?
- Are other people involved in this environment? If so, what do those interactions look like?
  - If further prompting is required: What did they do to make you feel comfortable/uncomfortable? What about them makes you feel comfortable/uncomfortable?
- Can you think of any additional examples of places/environments where you’ve felt safe and comfortable?

Can you think of any changes that could be made to reduce negative experiences in your everyday interactions/environments?
  - Further prompting: If you had a magic wand and could change one thing about society (use a specific example instead of “society”) what would it be?
APPENDIX C

Full Quotations Used in Results Section

Quotation 1 (DEP012): I tried for a really long time to act like I don’t care and I don’t need the social connection and I’m like better on my own but I’m not, like I-my younger brother’s totally fine being by himself all the time, and that works for him, but I feel like it’s something that I need and something that I want so, so bad is to fit in with other people and have close relationships with other people. But there’s something fundamentally different about me that prevents me from having that, and I’m scared that other people can see it

Quotation 2 (DEP007): We just want to be known and not affect anybody else. We’re not really all that different, we’re the same. The things that you want and the reason why we’re here and. I just, we’re not threats. We’re not scary. I’m not going to hurt you. I’m not trying to do any of these things to make you feel bad about yourself, or anything like that. I’m doing my best that I can to live my own life and live respectfully with respect to other people but, people just. I- I want to be someone to take the time to get to know me too.

Quotation 3 (DEP005): Like with friends, there’s other intrigue and stuff, like groups that they’re a part of, or like things they believe, but with family… even if they believe those different things, ultimately you are together because you are part of that family. Like, that, that common trait of being a part of that family is a thing that brings you together. And in that way, trumps all other like influences.
Quotation 4 (DEP003): Which is just like trying to like, pay attention like what they’re saying and like what they’re doing, how they’re feeling. Like facial expressions, body language. Um, but I also don’t think they have a lot of time to see friends. So like if I was to see them I think my most of my focus and energy would be on them because it’s like very limited time in my week that I can like focus on people.

Quotation 5 (DEP008): And so you know, even just little things like that, you know. That, that that can change in that, hey, I can just flip my perspective on from being “Okay, this is an uncomfortable situation,” to “Okay. It’s okay. There are people here who are, have the same problem to point, you know, they have similar things that I have and they just want to help. And so, you know, knowing that you know that that, that form of kindness, you know, soon showed me, you know, that that helped me. But yeah.

Quotation 6 (DEP009): EB: How would the people around you like on either side of you help you, make, make you feel more or less comfortable?
DEP009: If they were cracking jokes about how dumb the stewardess was and how she wouldn’t let us have our laptop out. Shared empathy over the horrible experience we’re in. Yes, again, If I had my laptop out, I wouldn’t be paying attention to them at all. I do not go on a plane to make friends. I’m here to get from place A to place. B.

Quotation 7 (DEP001): But first- first date, you know, especially if it’s the first date for the other person which it would be, but you know you’re in the same boat, so. I think there’s an element of discomfort for both people, so we can kind of just have fun, relate on that, enjoy our time
together, you know, don’t dwell on this stuff that makes us uncomfortable. Maybe talk about it like, oh, man, you know, first dates or whatever make a joke about it. Then that would make it less uncomfortable

Quotation 8 (DEP001): EB: Awesome, uh, what specific things make home or talking with your friends, family comfortable?
DEP001: Being able to be relatable all, you know, in the same boat with whatever we’re all in college or we all have a hard class or we’ve all we’re all going on first dates or whatever it is and then just being able to be vulnerable with each other, open up and then have trust too. Depending on how deep the conversation goes. Being able to know, OK, if I say this then I’m going to know and you’re gonna know and that’s it.

Quotation 9 (DEP007): I will talk to friends, if I already have made myself comfortable, they know enough about me that I know that they aren’t going to judge me and I can feel fine, just whenever I stumble over my words and people aren’t going to make fun of me when I know that I’m speaking incorrectly even. though I know I’m fully coherent. And they know that as well and they can’t understand me or they can’t hear me or they choose not to hear me. Rejection sensitivity dysphoria.

Quotation 10 (DEP002): I think if everyone had a good tone when they talk, and make people feel safe and not obligated with certain like, like kind of giving people safeties like outs. Like when you text someone, you’re like, hey, like I would love for you to come, but if not that’s OK. Stuff like that like if people, like in an interview if someone was like it’s like there is no right
answer. It’s OK like just give us what you think. Something like that where you’re, like, validated. And it’s also like there are no preset expectations that you have to guess. Type stuff.

Quotation 11 (DEP012): When I lived at home and when I come back from home, we’ll go walking on this like trail behind our house. It goes through a neighborhood and just like a creek up against it and we’ll go walk at night. And we’ll just like talk about life and how we’re doing and it makes me feel like I don’t know. I feel really safe with my parents. I used to have a really pessimistic outlook on life and say, like, I don’t have any heroes. I don’t wanna get close to people because they let you down and I realized living that way is so boring and sad, and I decided I wanted to get close to the people in my life.

Quotation 12 (DEP004): Um I just feel really comfortable and happier or whatever when I’m with my family, that’s probably when I’m the most relaxed honestly and of course Chester is there.

Quotation 13 (DEP010): The closer I am to someone the less I feel like I need to do that. So, like with my boyfriend he’s also autistic. You’re gonna talk to him later. He is maybe the only person on earth that I am comfortable being fully unmasked in front of. And I don’t know if I’m actually fully unmasked because, you know, it’s how I’ve been acting in the way I’ve been thinking for 24 years. But that’s definitely the most authentic version of myself.
Quotation 14 (DEP002): And I feel emotionally comfortable because my boyfriend is there and he can’t be mad at me if he’s sitting right next to me and asleep, so. No, that he’s never mad at me but… When you overthink.

Quotation 15 (DEP004): EB: And what about that, do you feel like, makes you feel uncomfortable?
Speaker DEP004: I feel like just the fact that I’m different than everyone else, you don’t like fit in, with like the niche of what’s happening.

Quotation 16 (DEP011): Um, I guess sometimes as a neurodivergent individual, I sometimes get the feeling of - the feelings of that I’m kind of a stranger in a world that wasn’t really made for me, if that makes sense. It’s like the, a lot of there are a lot of gender -or not gender, but social rules that don’t make a lot of sense to me.

Quotation 17 (DEP012): I also feel like there’s always this spotlight on me because people can tell when something is different with you, especially socially. People can sense, like, something is “wrong” with you and I always feel like I mess up and the other people’s faces are like wiggles because I can never understand how people are actually feeling

Quotation 18 (DEP003): And it was like this whole thing of, like, people who marry interracially like cause contention within the homes and their children are more likely to be like unpure, like something along those lines. So that was difficult, um, very uncomfortable. I didn’t feel welcomed. I felt discriminated. Um, no one in that group really stood up for me. They all just
kind of like would not look at me. I think I, I’m pretty sure I cried afterwards, which isn’t surprising.

Quotation 19 (DEP012): Interrupting people, do it all the time, constantly, which is why I like texting, because I’m physically incapable of understanding when someone is done speaking because my brain does not pick up on the facial or body signals that people use when they’re done, so I’m just guessing all day when someone has finished talking and it’s miserable for me.

Quotation 20 (DEP002): Because I feel like I prepare myself for very specific circumstances, like I like to know what I’m doing when I before I go someplace and like, who’s there? What’s the situation like? And so I think it would just throw off my internal like, what you’re supposed to expect. And then I think it also throws off you know, like the afterwards too. It’s like, well, I was going to arrive at this time and like I had all these plans so I think it just throws off the schedule I had planned on in my head

Quotation 21 (DEP012): I can’t read that in other people. And sometimes I feel like I have to walk on egg shells, but that’s just mostly when I’m talking to like parents of autistic like children. But that’s because I think the conversation is like very sensitive and very personal to them, you know. Not in, like, I’m gonna say something wrong and you’re gonna get mad way more like, I wanna say the right thing so you feel comforted way. But when I talk to when I talk to other people, I can’t tell if they’re uncomfortable or not. That’s like, actually like I said. It’s the blurry faces I have no idea. I’m sure they do though.
Quotation 22 (DEP010): having to talk to someone I don’t know. Then the full masking face goes on of like, um, “Yeah, okay, yeah, I understand that,” like. Um, yeah, but if I’m in one of those places for very long I get really tired. I tend to get migraines. It increases my anxiety. There’s a lot of social anxiety in there. A lot of watching my behavior, um, saying something and then going, “Was that the right thing to say? Was that weird? I don’t know.”

Quotation 23 (DEP003): I don’t think I was in the middle seat for that, but if I was to be in the middle seat, that’d be difficult because I’d feel very closed in. If they’re strangers, I’d be pretty uncomfortable. Um, I don’t really love uncertainty, especially like if, like if like there was a connecting flight or something that I needed to do, like the delay would be very stressful.

Quotation 24 (DEP012): But when it’s a new person. I have, you know, no idea. I have no clue and I have to rebuild it from scratch. And I’m 21 and I don’t order for myself at restaurants if I can help it like that’s how uncomfortable it makes me. Because I don’t want to do it, I don’t. I hate doing it.

Quotation 25 (DEP012): Leave me alone. I don’t. I don’t understand people who wanna talk on airplanes like that’s so not who I am. Don’t speak to me. I’m gonna put my headphones in and do my Sudoku puzzle. Stop talking to me. But because I feel this pressure to perform socially, if someone’s talking to me, I’ll go *pretends to remove headphones* huh? And if I’m in a mood where I can speak, I will speak back to them. I hate myself for it. That’s not true, it’s just I’m always like “This is so annoying” but I feel like everyone feels that way on airplanes. I feel like if you want to talk to the strangers next to an airplane, you’re probably a psycho.
Quotation 26 (DEP011): EB: Is there anything else that you feel like predicts how you experience your environment?

DEP011: I guess how expected something is. Cause a lot of my uncomfortable experiences are like mostly unplanned. It’s like I went in expecting one thing and found myself in something else.

Quotation 27 (DEP002): I think. If my day is like a regular, nothing new, nothing special If I’ve experienced it before that day before then no. But yeah, I just say like most new circumstances, even if I know it’s going to be safe, there is a level of uncomfortableness because it’s unknown. And so, I just get a little bit nervous, I would say less so than I used to.

Quotation 28 (DEP005): Like, taking time consciously to like—my wife loves those like, oil diffuser things that are really smelly, like sometimes her and I will just do like a yoga or a stretching like exercise. We’ll just put like, the oil diffuser on, we’ll clear the front room, and we’ll just do like 20 minutes of stretching, and then we might just like sit there, and like, quiet. It’s just, we’re just like quiet. We, we’re not trying to think about anything, there’s no objective, it’s just... we’re there. And to me, that is a very Zen, peaceful.

Quotation 29 (DEP007): And so like you already got a little bit of that nervous energy. And then, like, your jaw gets tight and you squint your eyes and then your hands come up to your neck. And then for me, it’s usually scratching at my skin. Like if the moment that I start scratching at my skin, that’s my trigger like I have to get out of here because it’s getting super bad. So that’s
just one example. There’s- there’s so many. The world was not made for people like me. Unless we’re all like living in a English countryside cottage. That sounds nice

Quotation 30 (DEP007): Sensory processing overload. It could be that, it could be- just pure overwhelmed. Could be burn out. It could be any sort of bad thing. But you just feel everything so intensely. For me, it’s like knives in my chest that are just grabbing me and just slicing me right through or like these giant hands that are just reaching and clawing on me. Those are supposed to be hands. They don’t look like hands. But, like, it just forces you to crawl and just pushes it till you’re literally in the fetal position. She’s kneeling, but eventually you just end up curled up in the fetal position on the floor, and it’s sharp and spiky because they’re sharp bits of pain. But then it also comes out in waves. And it just keeps going and going and going and there’s nothing you can do except just wait it out and hopefully there’s an end.

Quotation 31 (DEP002): OK, this was like last week. And I’m in my second or first, I don’t know, class and I was on my period and my body hurt so bad and I was super uncomfortable. Just like my stomach gets all icky and stuff. And it was super boring, I didn’t even know what he was talking about. Couldn’t pay attention. And it was only, like, not even halfway through the class, and I still had another class after that that was an hour and 15 minutes, and it was my finance class, it was even more boring. So, I was just feeling super awful, couldn’t pay attention, which also sucked because I’m there, I might as well, like learn something, but I’m not learning, so then I feel like I’m getting behind. It’s super boring and my body hurts. And I just want to leave. That’s why I wrote a little red “X”. Yep.
Quotation 32 (DEP004): I don’t know sometimes the lighting is a little bit annoying in the airplane. Because it’s like literally, right above you, but yeah, it doesn’t really affect me. It’s just kind of like oh that’s annoying.

Quotation 33 (DEP006): Yeah, that wouldn’t bother me. Maybe if there’s like music really loud playing? I’d be like, turn that down so we can actually talk. Lights wouldn’t bother me. Maybe if the sun was like right in my eyes. Then I would just move, though I wouldn’t like, leave the full conversation.

Quotation 34 (DEP012): I feel like. Like there’s a fire alarm in my brain. Which is probably a good reference cause when I was a kid, when the fire alarm would go off I would like, scream and cry. But it feels like someone has ignited- I used to say like “All my bones are activated” is how I would describe it to my friends. Like all my bones are turned on to fight mode and I can feel everything in my body and my hair is touching my neck and my clothes are sitting wrong and all of that, and all the sensory input like I don’t feel pain or temperature because my body is already so focused on clothing and sounds that to add more to that, like it shuts everything down like. I can’t think anymore. I can’t talk. I can’t do anything because my brain is so hyper focused on how everything is feeling and sounding mostly feeling and sounding for me.

Quotation 35 (DEP003): I think safety is more like people for me. I think that my home is a safe place, but I think that I made it a safe place because I’m just very hypervigilant, but yeah, that’s a different story, um. So I think that my second oldest sister, someone that makes me feel very safe just because she’s a very protective person.
Quotation 36 (DEP012): I have another brother, but he’s not autistic, so it doesn’t matter as much but for me and my brother and my sister, like our house growing up, it’s like laminated schedules on your door and in the bathroom you open you know the little mirror, that’s yours, you guys have opening mirrors. Each of my siblings had one, and you’d open it and it’d be laminated schedule with everything you need to do for the morning. And, like, keeping that sense of security is really important.

Quotation 37 (DEP004): Um probably just cause like I feel like I have like a routine of what like I do like every day, if that makes sense. And so like, changing something in the routine, even though it’s not like a crazy big deal. I feel like, so I’m kind of like, whoa, yeah. Like, this isn’t normal. Like something to me is like hey what’s going on here.

Quotation 38 (DEP005): Um, and so part of it is just feeling like it’s a place I feel comfortable in the sense that I -I’ve spent a lot of time there. I spent a lot of time like learning that and growing my skills there. And it’s a place that like I’m- I -every time we go in there, it’s like it’s not promised that it turns out good. We’re always trying new things and that’s kind of a fun place to be. For myself. For us.

Quotation 39 (DEP009): It’s always like I see life—not, not exactly—but I kind of see life as I mean, you always can learn and grow, so I’m always trying to learn and grow. I mean, I unintentionally thought of like 7 facts when I first started talking to guys about like blue crab and
all sorts of stuff like that. But I like learning new things, growing, becoming better. And that’s just what my life is, and that’s just my lot in life.

Quotation 40 (DEP009): I don’t expect you guys to go like, “You held your crayon wrong, and so you actually hold it better because that’s offensive to Middle Easterners,” right? Like if you told me that I would fix it, but then if you like started like getting really upset, I would kind of be like, “OK. Like I’m holding a crayon, like, geez.” But if I learned something about that myself internally, I’d more fondly, I guess it’s more of an internal than an external forcing upon me kind of thing. Internally, I’m fine learning to grow and change, but if someone’s like, “You will change like this!” It’s very tiring, very fast.

Quotation 41 (DEP007): By the time I’m at this point, it’s a lost cause, there’s absolutely nothing you can do or anyone can do. All the doctor says is just need to take the drugs to knock me out and that’s the best thing solution that anybody has ever come up with: drugs. Knocking yourself out, going to sleep.

Quotation 42 (DEP003): Yeah, I think I feel the most discomfort in situations where they’re like, I’m not in a position of like control in the sense of, like, I either don’t know what I’m doing or like I am not the authority figure. Which sounds weird because like I don’t like being authority figure but for example like with the G tube like I am not an expert on it so I don’t feel like an authority figure. So I got uncomfortable with statistics. I don’t feel like good at statistics, so I feel like I’m not an authority figure. I feel like I don’t have a lot of power. So I think that’s probably the main theme and then same with like driving and like the freshman year experience
like, I was definitely not in the position of power or control, and both the people that were in higher positions of power and control were just like consistently not great.

Quotation 43 (DEP004): I don’t know. I just kind of, like, I would want to like present myself as like being my best self around like other people. And so I definitely like hold myself to a higher standard if that makes sense and I want to like, I don’t know, like I don’t know, they just like. I don’t know. This is hard. I don’t know why I feel like I wouldn’t be as comfortable, maybe just like. Maybe just because, like, I’m not like, it’s an environment that I’m not used to in addition to like the like, the holding myself to a certain standard, like stuff like that. Probably that has something to do with it too.

Quotation 44 (DEP012): It’s me in like a social setting. I yeah- I always feel like. Because I know intellectually, that, like I care about myself way more than anybody else does, and I’m critiquing myself way more than anyone else is. I also feel like there’s always this spotlight on me because people can tell when something is different with you, especially socially. People can sense, like, something is “wrong” with you and I always feel like I mess up and the other people’s faces are like wiggles because I can never understand how people are actually feeling.

Quotation 45 (DEP007): That’s kind of like one of the things like you’re living in a world that’s not designed for you, no matter how hard you try, your efforts are just not enough over and over again. And it makes you wonder why the rates of suicidality are so high among the autistic population, especially in females, because if nobody’s being able to accommodate any of your needs. If you’re not even having your basic needs met to be loved, to be understood, to be taken
care of. And no wonder you just want to die because nothing else was at that point nothing else can really scare you. It’s just something else, something different, because that is something that you can change at that moment, even if it’s the only thing left that you can change. You can change that.

Quotation 46 (DEP002): I think the same is kind of like jittery, shaky I also tend to get really cold when I’m nervous. My hands get super cold and like, clammy. So, I think just like those things like, I felt a little bit shaky and cold and yeah… Just kind of like choking, like, not, like, physically choking, but like, I wasn’t as eloquent with my words, and nothing felt as natural for me, like my body movements and everything, because I again was worried that I was in trouble or I was going to like get yelled at. Or some sort of like emotional toll was going to happen because I’ve done something like wrong.

Quotation 47 (DEP010): Yeah, like you know how you stumble over your words sometimes when you’re really nervous? Yeah. Imagine that. But, like, you can’t talk at all.

Quotation 48 (DEP003): Um, I think sitting helps me feel more comfortable, interestingly, because I think that it’s easier for me to mask that I have been shaking because like when I if I have to like stand like my knees will shake or like my legs will shake or my hands. But I think if I’m sitting I can either like put my hands on my lap or like cover like cross my legs and it doesn’t show it. Other than that, I don’t know. Usually I have a hair band on my wrist. I have it up today, but usually I fidget with that if I get especially nervous. I do that as well.
Quotation 49 (DEP008): You know, probably if I didn’t have the fidget, you know, I would be like, especially in a moving chair, like what I’m in right now, yeah, I’d be moving back and forth and back and forth. Yeah, just trying to do something to, you know, relieve the stress. Within the that then, yeah. And the, you know the the the thing that, you know, something that’s that, you know, I can squeeze something uh or just kind of a pressure. You know, that’s what I, I do. I do a plushy design, just kind of squeeze it, very soft in it. Not to be weird when we’re in scenario like that, but something like that. Ya know, it relaxes my body and it’s like, okay. It’s just a little, you know, we may feel a little stressed, but it’s like gonna be okay.
APPENDIX D

Annotated Bibliography


The double empathy problem draws attention to the difficulty that autistic and non-autistic individuals have in connection and mutuality with each other. Autistic individuals’ supposed deficit in “theory of mind” may be due to their tendency to make more open-ended assessments of mental states, rather than making premature conclusions. Methodologies that promote neurodiversity should be considered to overcome the double empathy problem. For example, fiction is inherently social and requires levels of the “theory of mind.” Fictional reading allows autistic individuals to make more open-ended and in-depth assessments of perspective while allowing non-autistic individuals to gain real-world understandings. Together, these advantages are a helpful tool in overcoming the double empathy problem. Methods: 4 autistic and 4 non-autistic individuals were recruited for the study. They were grouped in pairs based on gender, and where possible, age and educational background. They were all 18 and older, and had proficient English language skills. Non-autistic individuals had to score below 32 on the autism quotient, and autistic individuals had to have a formal diagnosis of autism. Participants read “Of Mice and Men” at a rate of one chapter per day for 6 days. They kept a reflective diary about narrative events and characters. Participants filled out a pre- and post-session questionnaire evaluating their perspective and understanding of each group as well as what they learned from the sessions. Participants joined discussions in pairings for 1 hour weekly, for 4 weeks. Findings:
The assigned literature provided a shared experience between pairs of autistic and non-autistic individuals. They found it easier to start a conversation, as well as explore their nuanced differences in reasoning within the context of the book. Although many of the participants who entered the study had some stigmatized understanding of each group, these assumptions were challenged and changed through literary discussion. Relevance to current work: This article is valuable as it provides insights into qualitative research and assessment, as well as findings on overcoming the double empathy problem. These findings show that through shared experiences/context, autistic and non-autistic individuals can overcome the double empathy problem through empathetic perspective-taking. My study will further explore how society can overcome the double empathy problem through shared experiences and art.


There are multiple theories behind the primary deficits found in autism. This article discusses the social motivation theory and the research behind it. Social motivation is a powerful force that guides human behavior. A deficit or disruption in social motivation mechanisms may constitute a primary deficit in autism. Methods: Through literature review, this article discusses the theories supporting and refuting the social motivation theory of autism. Findings: There are roughly three behavioral manifestations of human’s social interest. They are as follows: objects with social importance are prioritized by attention, social interactions are rewarding, and interpersonal behaviors are influenced by the desire to maintain relationships. Within the first year of life, autistic children show more interest in the background than the characters socializing in their view. They do not show any preference for socially salient sounds over non-social
control noise, and display attention deficits for speech but not for non-speech sounds. autistic is a multiple-deficit diagnosis, and theories surrounding it should take this into account. Although there is no perfect theory behind the primary deficits in autistic, the social motivation theory provides valuable insights into the difficulties those with autism experience. Within this theory, social impairments can be explained by the fact that individuals who struggle to understand the social world are likely to end up losing interest in it. Relevance to current work: This article provides valuable insights into the underlying cause of social differences in autistic. The information presented in this article will be important to take into account as the current study aims to bridge the gap between autistic and nonautistic individuals. According to this article, those with autism may lack motivation to interact with nonautistic people.


This article is in response to Milton’s article on double empathy. It aims to highlight some of the issues of relationality and interaction that researchers often overlook when discussing autistic and non-autistic individuals. It supports Milton’s argument by further discussing possible reasons for a difference in theory of mind abilities in autistic and non-autistic individuals. Findings: Theory of Mind (ToM) difficulties do not necessarily precede social interaction difficulties. Social interaction frequency and opportunity likely affected an individual’s ability to develop ToM. Thus, if the roles in society were reversed, and we were living in world with autistic majority, ToM develop may look different for non-autistic people. If non-autistic people were given the same level of interaction with their peers as autistic individuals generally have, the autistic individuals would likely develop ToM abilities similar to a non-autistic ToM. If we are to assume that non-autistic ToM is superior to autistic ToM, then
we are to assume that if non-autistic individuals were in the minority, they would have a better ToM than autistic individuals currently have in the real world. Another question brought to light, is whether the lower salience of socializing in autism leads to reduced social interaction, which in turn reduces their ability to understand public criteria of mind. autistic individuals’ supposed ToM deficits are partly dependent upon the nature of society, and may be different if roles were reversed. Relevance to current work: This article offers insights into possible explanations of the difference in ToM between autistic and non-autistic individuals. It suggests that if society was flipped, and the roles were reversed, we may discover that non-autistic ToM is no better than autistic ToM. Their differences are largely due to the nature of society, rather than a true deficit in cognitive ability.


Several studies have been done identifying the sex-based differences in a variety of autistic diagnostic traits. Males with autistic exhibit more repetitive motor behaviors. Females with autistic have been found to exhibit more appropriate language skills in social interaction, use more gestures, show greater visual attention to faces, and have a higher rate of internalizing problems. There are many factors that may contribute to these differences, one being the cultural expectation for females to engage in adaptive social communication. Research has found that women are more often camouflaging, which can have negative mental health costs. Methods: Their sample included 115 males and 46 females between 10-16 years old with an average to above-average cognitive ability and a diagnosis of autistic. Three tests were conducted to ensure
autistic diagnosis and cognitive abilities. A contextual assessment of social skills was then conducted by individuals engaging in two sequential three-minute role-play scenarios with two opposite-sex TD peers. The peer would act either as interested or bored during the conversation. Each scenario was videotaped and coded. The codes included asking questions, topic changes, vocal expressiveness, gestures, positive affect, kinesic arousal, social anxiety, overall involvement, and quality of rapport. These were graded on a 7-point scale. Findings: Females showed fewer restricted and repetitive behaviors. Males and females showed similar social affect scores. Females were marginally better at vocal expression, but no differences in anxiety were reported. Some of these findings were hypothesized from previous research studies. Relevance to current work: This study provides valuable insights into sex-based differences in autistic and the areas where further research needs to be done. It highlights females’ tendency to camouflage, which may be an indication of their ability to recognize the needs of and empathize with NT individuals.


The arts provide meaningful opportunities for individuals to study and practice empathy by allowing the individuals to enter artists’ personal worlds. The ability to observe and reflect on others’ emotions is essential within the medical field, especially in doctor-patient relations. Methods: Through a literature review, this article provides insights into the connection between art and empathy, as well as their purpose within the medical field. Findings: There are two essential components of empathy. These components include the ability to observe and the ability to imagine another person’s world. Art pieces give individuals the opportunity to observe and reflect for extended periods of time. They “take us out of ourselves” and provide insights
into another person’s mind. Since empathy is the process of observing and stepping into another’s mind, art can be a valuable facilitator for building empathy. The key component for art to build empathy is for the individual to feel a genuine interest in others. Relevance to current work: This article supports that art facilitates empathy. It provides the process of developing both art and empathy, and how it can benefit individuals. This supports the use of art to bridge a connection between different types of people.


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This article offers research regarding various neurodiversity approaches, and the ongoing controversies about these approaches. It explores the interaction between neurodivergent people, their interactions, and their environments. The social model suggests that an individual’s disability emerges entirely from society’s responses to the individual’s deficits. A weakness in this theory is that not all deficits that autistic individuals experience will be solved if society changes. For example, someone who struggles with executive function might still encounter time management challenges even if they have access to scheduling apps and accommodations. Methods: Through a thorough literature review, this article offers insights into neurodiversity, questions and controversies, neurodiversity within the developmental theory, and how to implement this knowledge into future research studies. Findings: Neurodiversity has many different perspectives and theories, but ultimately, the optimal neurodiversity approach takes a middle ground between the social and medical models. This would include considering disability as emerging from an interaction of the individual and context, and would allow
intervention for neurodivergent people to change either the individual or environment in limited ways. Relevance to current work: This article highlights important concepts for constructing a research study about autism. It thoroughly reviews the research to offer a comprehensive understanding of neurodiversity, and the theories behind it. This article will help construct good interview questions as well as offer valuable insights into interaction between NT and neurodivergent individuals.


There is no agreed-upon definition of empathy, but there are roughly three steps in what we define as empathy. These steps include noticing that someone else is feeling something, correctly interpreting that behavior, and feeling those same feelings. autistic individuals may be less able to perform the first couple of steps due to monotropism, and the fact that they are being asked to interpret the emotional signals of a different group (nonautistic). Societal norms and expectations dictate empathetic and appropriate responses. autistic individuals may appear to lack empathy when in reality, they are simply “not following the same response script as a NT person.” Findings: Multiple problems have been found in empathy research. Research has been done measuring how successfully one expresses empathy, and has thus mislabeled autistic people as lacking empathy. The expression of empathy likely looks different in each individual, especially as autistic individuals may express it differently than society expects or is used to. A meaningful study was done using a pain paradigm, and found that a group of autistic individuals did in fact demonstrate typical empathy for pain. As empathy is bundled together with social cognitive processes like theory of mind, autistic individuals are mislabeled as lacking empathy. New research findings show that autism is associated with an atypical theory of mind but not
empathy. The misrepresentation of autistic individuals is harmful not only to society, but also to the lives of those with autism. Relevance to current work: This article discusses the need for further research on empathy for both autistic and nonautistic individuals. It encourages future studies to take into account what autistic people say about their experiences of empathy and to include their lived experiences in the research. These suggestions all support this research project to further explore the similarities and differences between autistic and nonautistic lived experiences and the emotions underlying those experiences.


This article investigates how materials within an environment can impact an autistic individual’s actions and experiences. The physical environment is considered to be a cause for how a person with autism might feel and behave in a given situation. This article looked to incorporate elements of empathy by asking the question: How can a NT designer begin to understand and empathize with an autistic person whose lifeworld and lived experience are so different from their own? The designers began to bridge empathy by entering autistic individuals’ homes and by seeking to experience the things they experienced. Methods: The researchers used a strengths-based approach by exploring the autistic individual’s triad of strengths and sensory preferences. The environments were then altered to fit a specific person’s preferences and strengths. The researchers highlighted that although NT people and autistic people perceive and experience the world differently, they do share a physical environment. Findings: Once the priority was placed upon the designer’s ability to connect, listen, and accurately interpret information from autistic people rather than the design itself, empathy was
built between the designer and the autistic person. The designer was able to understand what another person’s emotional response may be to different things. These factors contributed to the design of environments. Relevance to current work: This article outlines the importance of bridging empathy between NT people and autistic people. By bridging empathy, designers are able to modify environments to benefit more individuals. It also highlights that NT and autistic people all share a common physical environment. This common ground can be the foundation for bridging empathy.


Art has an “astonishing potential to build community through empathic social interaction.” In this perspective, empathy is defined as the human capacity to understand the world of objects and the world of others. Through mirror neurons, human brains are able to be activated through looking at objects and other people. These mirror neurons help individuals build connections and empathy towards each other. Methods: This article discusses past research done regarding mirror neurons and art. It seeks to expand this concept into art education to bring students together in empathy. Classroom observations were done during art presentations. Findings: Through sharing art pieces with each other, students connected with each other. One student stated, “I felt a connection with her and felt bad for her situation.” Others related to specific art pieces and felt a personal connection to the art. Across the board, art facilitated a connection into the minds of students. The article states, “If you have the possibility of simulating your own body states, you also have the possibility of simulating the body states of others; you can go from the body of the self to the body of another and through the body, into the mind of another.” Art serves as a facilitator of simulating the body states of others, and helps
individuals see into the minds of others. Relevance to current work: This article provides support for art’s potential to increase empathic connections between different groups of people. It offers valuable insights into why art is a facilitator of empathy, and how it may be used to benefit people.


This article is in response to Milton’s original article regarding the double empathy problem. It highlights the mental shift from believing the problem resides in the brain of the autistic person, to the problem residing in the interaction between autistic and non-autistic people. Differing sensory perceptions between these groups greatly impact communication and shared understanding during their interactions. Methods: This article is an editorial that summarizes past and current research done regarding the double empathy problem. It supports Milton’s original claims by providing current research regarding the double empathy problem.

Findings: It is important for society to move beyond the binary of autistic/NT toward a continuous understanding of neurodiversity. Rather than viewing autism as a social communication disorder, it can be viewed as a different way of being that can lead to effects on social interactions and understanding. The misunderstandings in interactions between autistic and NT people could be partially due to different expectations or preferences. Relevance to current work: This article highlights current research regarding the double empathy problem. It encourages society to approach the differences between autistic and NT people with humility and understanding. It encourages society to approach differences in interaction as opportunities to learn and understand each other.

Autism has been defined as encompassing a theory of mind deficit. This view has positioned autism as a neurological disorder, and as such, its treatment often involves modifying the autistic person to fit in with the mainstream culture of society. Autistic individuals are pinned with having ‘deficits’ in theory of mind and empathy. This typically refers to the ability a NT individual has to assume an understanding of the mental states and motives of other people. However, when NT individuals’ ‘empathy’ is applied for autistic individuals, it is often wildly inaccurate.

This lack of empathy is accounted for in the ‘double empathy problem.’ This problem is defined as, “a disjuncture in reciprocity between two differently disposed social actors which becomes more marked the wider the disjuncture in dispositional perceptions of the lifeworld–perceived as a breach in the ‘natural attitude’ of what constitutes ‘social reality’ for ‘non-autistic spectrum’ people and yet an everyday and often traumatic experience for ‘autistic individuals.’”

Both NT and autistic individuals experience the double empathy problem. Any sort of breakdown in interaction leads an individual to perceive the other as ‘different,’ rather than ‘normal’ or ‘correct.’ It may be true that autistic people often lack insight into non-autistic perceptions and culture, yet it is equally the case that NT individuals lack insight into the minds and culture of autistic people. Many autistic people have gained more insight into non-AS society, as they are the minority. The differences in neurology between autistic and NT people may produce differences in sociality, not due to social deficits, but because of society’s idealized normative view of social reality and expectations.

This article explores the link between autistic people being misperceived by NT individuals and the effect misperception has on their mental health and well-being. Exclusion and misperception increase division in society, and have created a ‘double empathy problem’ between NT and autistic individuals. Social experiences critically influence the way autism develops over the lifespan. The double empathy problem suggests that autistic people have difficulty fitting into society not just because they misunderstand others but also because they are misunderstood by others. Methods: Through a collection of various sources, the authors share insights into how autistic people are misperceived by NT people and how it impacts development and mental health. Findings: A highlighted study found that NT perceivers were significantly more accurate in making an inference to the type of greeting when viewing NT reactions rather than autistic reactions. Autistic and non-autistic people have different communication styles, and therefore have difficulty communicating and empathizing with each other. Both NT and autistic individuals appear to lack the capacity to empathize with each other. Relevance to current work: This article is relevant to my research, as it thoroughly explains the double empathy problem and its implications. It approaches autistic characteristics and social behavior as unique and meaningful rather than as impairments. It provides research into the relationship between autistic and non-autistic individuals and the misperception and communication that occurs between the two.

This article aimed to address issues such as the double empathy problem and understanding neurodiversity. The disorder-defining concept of “lack of social understanding” should be understood in the context of a common lack of reciprocal empathy. They propose an intervention that focuses on creating the necessary conditions for mutual understanding and development. Methods: 4 participants were selected. 3 of the participants were on the spectrum for autism and one was NT. Each gathered together to discuss their own experiences and alternated roles of “researcher” and “interviewee” during discussions. The dialogue was recorded and analyzed. Findings: Themes of trust, emotionality, and states of mind were shared among all participants, while themes of sensorium and social joining appeared relatively distinct. The need for trust and reliability, the impact of context on the regulation of emotion, sociability, and empathy, showed striking commonalities among all participants. It was equally important for all people to have a social context in which they felt comfortable expressing their needs and frustrations safely. NT individuals appear to adjust easier to various environments and could focus their attention on social and contextual demands. Those with autism have more intense attentional peaks, which results in an apparent “empathy deficit,” when it’s really more of a “preoccupation surfeit.” Relevance to current work: This study is relevant to my research as it provides insights into the common themes across the human spectrum. It explores the intrinsic causes of the outward differences between NT and autistic people. By understanding these commonalities and differences, we can begin to establish empathy and patience for each other across the human spectrum.

Past research has distinguished between cognitive and emotional empathy. Cognitive empathy is thought to encompass the theory of mind, while emotional empathy is one’s capacity to experience affective reactions to observed experiences of others. Labeling autistic individuals as “lacking empathy” or having deficits in the theory of mind are dehumanizing and perpetuate dangerous stereotypes about autistic people. Methods: This article offers questions and discussion between four autism professionals regarding autism and empathy. Two of these professionals are autistic themselves. Findings: Through discussions, experts discussed the difference between empathy and compassion. Empathy is more likely to be elicited by like-minded people, whereas compassion can be more generally applied and is less prone to bias. It is extremely difficult to accurately measure empathy, and people often rely on external behaviors and observations. Because of external behaviors, autistic individuals are less likely to be believed or trusted. This truth speaks to the intrinsic biases that many individuals hold towards autistic people. It is important for society to expand their perspective beyond looking at autism as having deficits in social awareness/empathy and instead look to the surrounding environment and other reasons autistic people are being perceived a certain way. Dr. Yergeau stated, “Austistic people have such rich relationships with other people as well as animals, things, and their broader surroundings. I would hate to see that be discounted or seen as an impairment.” Relevance to current work: This article provides valuable discussion and insights into past and current research on autism and empathy. It humbly presents common issues that surround the perception
that autistic people lack empathy. Its findings support future research regarding the double empathy problem and ways to bridge the misperceptions.


Past research has shown that art fosters empathy. This article is specifically aimed for the use of art in occupational therapy, but provides valuable insights into how art develops empathy. There are three actions that result from works of art. These include response, emotion, and connection. Methods: Through literature review, this article provides insights into past and current research regarding the relationship between art and building empathy. Findings: Art elicits a response by immersing its viewer into some reality for the sake of understanding it. Empathy is similar in nature, as it entails entering into an exchange that shapes the understanding of another’s reality. Through immersion into another’s perspective, empathy is built. Both empathy and art affirm emotionality. Art is an expression of emotions, and empathy is built with understanding and feeling emotions. Lastly, art and empathy share the purpose of connection. Art’s moral purpose is stated, as “to remove prejudice, do away with the scales that keep the eye from seeing, tear away the veils due to wont and custom, perfect the power to perceive.” Empathy can be built as individuals tear away assumptions and open their minds to new perspectives. Relevance to current work: This article provides research support for the potential art has to build empathy between individuals. It highlights the similarities between the creation of art and empathy, as well as the factors that influence art’s efficiency in building empathy.

Teaching empathy to young students in their classroom should be central to their learning. Empathy unites humanity, and shows that we care for each other. Empathy involves both identification and imagination. Art provides a means to strengthen both identification and imagination in individuals. Findings: Empathy is not a trait that all people exhibit, but it is an extremely valuable characteristic that should be nurtured. Through identification (connection of care between who we are and whom we see before us) and imagination (how our perception of the other becomes our reality), empathy and compassion can be built. Art provides a range of opportunities to foster this type of empathy. Art can act unlock imagination in order to bring a connection between expression and emotion. It provides a means to create community, and join people together who are otherwise alone. Relevance to current work: This article supports the use of art to facilitate empathy and compassion. It highlights its’ importance in the classroom, as well as continuing to nurture this ability throughout one’s life. Similar to my research study, this article emphasizes the importance of building empathy in society, and the role that art can play.


Art can be highly educational and influential for medical students, caregivers, and patients. Art that is created in response to one’s emotions about a patient is called response art. This type of art can provide meaningful self-reflection and build empathy between students and patients. Methods: 81 students attending the University of Hong Kong (HKU) participated in an art and poetry workshop. With the help of a qualified art therapist and family doctor, students created poetry and art pieces based on a patient. Students also participated in a State Empathy Scale both before and after their workshop to assess any increase in their empathy. Findings: Analysis of the students’ pre- and post-empathy scales showed an increase in empathy. This
scale analyzed feelings such as softhearted, empathic, warm, concerned, compassionate, upset, alarmed, troubled, empathic concern, and personal distress. Each of these feelings increased in post-test scores, aside from the personal distress index. These findings suggest that the creation and exposure to art can increase an individual’s ability to empathize with another. Relevance to current work: This article provides valuable insights into the power of art and its potential use in building empathy between groups of different people. It also supports the implementation of these practices across the medical field to increase professionals' empathy toward their patients.


This article reviews research studies concerning the development of the theory of mind and various perspectives on autistic individuals supposed “deficits” in the theory of mind. Past research primarily focused on the difficulties autistic people demonstrated in understanding non-autistic people. More recent research has shown that non-autistic people have similar difficulties understanding autistic people. Misunderstandings in communication are not a consequence of autistic ‘impairment’ but rather a mutual failure to reach a consensus through bilateral empathy. Findings: Recent research has shown that autistic people do develop the theory mind at steady progress, simply in a different timeline and sequence than NT people. Contemporary theories suggest that people are most successful at inferring the mental and affective states of those who are most cognitively similar to themselves. Even in a shared context, two different minds can generate two completely different mental states. Differences in sensorimotor experience, participatory sense-making, and cognitive abilities affect how people experience the world, even within the same environment. A “mutual cognitive environment” can occur when
there is a shared physical environment, sharing autobiographical knowledge, and shared worldly knowledge. This is only possible for individuals of similar cognitive abilities, and because autistic and NT people do not share similar cognitive abilities, it creates a problem in mutual understanding. Autistic minds maintain very few simultaneous interests in an environment and each one is highly aroused and focused upon. Non-autistic minds are able to entertain many simultaneous interests, each at a moderate level. Thus, even a ‘shared environment’ will be processed and experienced differently. This understanding should shift the responsibility of mutual understanding from autistic people to all communication partners involved. Relevance to current work: The article concludes by encouraging that further research should be done to “develop ways to best bridge these cognitive differences to support mutual understanding—perhaps through alternative means of establishing shared mental states and common ground, or encouraging extra efforts on the part of the non-autistic interlocutors.” This supports the need to bridge the gap in empathy, and use alternative means to accomplish that (i.e. through art).


This article discusses the process of interpreting other people’s emotional and mental signals to infer things about their reality. It refers to “retrodiction” which is the process of identifying the cause of extant behavior. The ability to retrodict typically emerges early in development as “social referencing.” Findings: Retrodictive inferences involve labeling the expression, identifying the target’s inner state, as well as inferring the event that caused the target’s inner state. This ability requires some understanding of both the situation and the person. The best way to measure the ability of retrodiction is to ask perceivers to identify the event that
caused the target’s inner state, and in turn caused their observable behavior. Relevance to current work: This article highlights potential problems in measuring qualitative data about retrodiction and theory of mind. Autistic individuals are often labeled as having deficits in “theory of mind” and retrodiction. As autistic and NT individuals are interviewed, it will be important to remember these findings on how to reliably measure an individual’s retrodiction.


This article follows one artist’s experience with creating artwork that evokes compassion and feeling. They walk the reader through specific methods, colors, and space that create a meaningful art piece. Methods: Through exploring various art pieces, the artist is able to find what aspects of artwork are most impactful for the audience. The artist shares multiple examples of their art pieces and their meaning. Findings: Each of humanity share universal human experiences. This artist used their art to show that we all have more that unites us than divides us. Through their artwork, this artist sought to spread compassion for others whom many people may see as different from themselves. Through art, the artist welcomes viewers to join their dialogue and enter into a different time and space. Art has a power to discover something inside of people that they cannot articulate or address in another form. Relevance to current work: This article provides personal insights from an artist seeking to build compassion and empathy for others. Through artistic techniques, they share how they express this empathy through artwork. This article supports the use of art to build empathy between seemingly different groups of people.