

How do Neurodivergent People Engage with Tone in Digital Spaces?

A Study on the Written Expression of Tone and Intent

by

Sydney Hadden

A Thesis Presented in Partial Fulfillment
of the Requirements for the Degree
Master of Arts

Approved April 2023 by the
Graduate Supervisory Committee:

Kathryn Pruitt, Chair
Karen Adams
Tyler Peterson

ARIZONA STATE UNIVERSITY

May 2023

©2023 Sydney Hadden

All Rights Reserved

ABSTRACT

The purpose of this thesis is to identify the ways neurodivergent people engage with tone and intent, in spaces where the expression of such things is missing the audible and visual cues that exist in face-to-face communications. Interviews were conducted with four participants who self-identify as neurodivergent, with each of the interviews seeking to understand their experiences with the written expression of tone and intent. The interviews shed light on how direct, semi-direct, and indirect tone indicators are used as tools for understanding the intent and tone of a message, as well as which of the three types of tone indicators are the most helpful in practice. The interviews also touched on how social interactions in digital spaces are often viewed through a neurotypical lens, and thus make understanding the sociolinguistic rules of digitally-based interactions difficult for neurodivergent individuals who are expected to know said rules without being told. Through the course of the interviews, participants expressed a desire for people as whole to be clearer about their tone and intent when communicating in digital spaces, and that tone indicators are vital for communicating such things.

DEDICATION

To my grandfather, Dr. Dan Baxley.

ACKNOWLEDGMENTS

Thank you to my committee: Dr. Kathryn Pruitt, Dr. Karen Adams, and Dr. Tyler Peterson. Special thank you to my Chair, Dr. Kathryn Pruitt; your guidance, patience, and wisdom were vital not only to the success of my thesis, but to my success as an undergraduate as well.

Thank you to my family, who supported me through many late nights of studying and writing, and have been the most incredible supporters of my education. Thank you to my father for always believing in me, and thank you to my mother and grandmother for encouraging me to continue on when the path ahead seemed bleak. Thank you to my friends for being a welcome reprieve from the weight of my studies, and to Hailey, for always being by my side.

And finally, thank you to the late JRR Tolkien, whose work as an author and linguist inspired me to pursue this area of study to begin with.

TABLE OF CONTENTS

	Page
LIST OF FIGURES.....	vi
CHAPTER	
1 INTRODUCTION	1
2 LITERATURE REVIEW	3
3 METHODOLOGY	15
4 RESULTS	16
Question 1.....	16
Question 2.....	18
Question 3.....	20
Question 4.....	23
Question 5.....	25
Question 6.....	27
Question 7.....	30
Question 8.....	33
Question 9.....	35
Question 10.....	38
Question 11.....	41
Question 12.....	43
Question 13.....	46
Question 14.....	48
5 DISCUSSION	50

CHAPTER	Page
6 CONCLUSIONS	52
REFERENCES	53
APPENDIX	55
A HUMAN SUBJECTS IRB APPROVAL	55

LIST OF FIGURES

Figure	Page
1. Figure 1: List of Interview Questions	13

CHAPTER 1

INTRODUCTION

The everchanging nature of the Internet has a direct connection to the development and use of language in the spaces that exist within it. Social and linguistic rules rapidly become mainstream and fall out of public favor, seemingly without reason. The exacerbation of the evolution of language, although fascinating, has potentially left neurodivergent individuals scrambling for a means to adjust to the linguistic drawbacks of purely online interactions. The development of new means of indicating tone and intent, though largely subconscious to neurotypical people, may serve as an olive branch of accessibility for those who struggle with interpreting such things. By exploring how neurodivergent people engage with tone in digital spaces, the general public can be given insight into where struggles exist and how misunderstandings can be rectified and potentially avoided altogether.

This study serves to explore that gap in research, and ultimately offer insight into where headway can be made towards greater accessibility in digital spaces for neurodivergent people. This study will examine the lived experiences of neurodivergent individuals who engage socially online, and seek to reach conclusions on where difficulties exist in tone interpretation and what tools already exist that neurodivergent people use to help them navigate the social scripts of digital interactions. This study centers English speaking communities and takes an interactional approach by considering both the speaker/sender and the receiver in digital communications. Given the lack of research on this area of study, this thesis aims to encourage future research on the neurodivergent experience with language in digital spaces, with an emphasis on the

existence and use of tone indicators, so as to move towards greater accessibility of language on the Internet.

CHAPTER 2

LITERATURE REVIEW

In recent years, the term “neurodivergent” has become a popular general term for any individual who generally falls under the classifications of having a neurodevelopmental disorder, as defined by the American Psychiatric Association (APA) in the Diagnostic and Statistical Manual of Mental Disorders: DSM-5-TR (DSM-5-TR). As stated by the APA (2022), neurodevelopmental disorders are “characterized by developmental deficits or differences in brain processes that produce impairments of personal, social, academic, or occupational functioning,” which allows “neurodivergent” to serve as a coverall term for those who meet the aforementioned characteristics in popular usage, despite the word itself not appearing in the DSM-5-TR. Examples of disorders that meet said criteria include autism spectrum disorder (ASD), attention-deficit/hyperactivity disorder (ADHD), and obsessive-compulsive disorder (OCD), amongst many others (American Psychiatric Association, 2022). While clinical criteria have been the standard for indicating inclusion under the blanket of neurodivergence, Stenning and Rosqvist (2021) note that neurodivergence, and its generalized use, is subject to much fluctuation in its agreed upon definition, and it seems to warp to fit the needs of society at large (p. 1532). As a result of this, it can be assumed that instead of basing neurodivergence solely on the clinical criteria laid out for (for example) autism, we can “leave the possibility open that there are other forms of difference that have yet to be defined” (Stenning & Rosqvist, 2021, p. 1532).

Additionally, given that the disorders/conditions that fall under the term “neurodivergent” are “spectrum conditions which have a range of associated

characteristics,” there are “varying degrees and combinations in neurodivergent individuals (and in the general population). Hence, the characteristics displayed by a person with one or more neurological condition will not necessarily match another person with the same condition(s)” (Bewley & George, 2016, p. 4). Furthermore, disorders that fall under the neurodivergent label can and often are misdiagnosed as a result of the comorbidities that exist between the various neurodevelopmental spectrum disorders (Takara et al., 2015, p. 82). With the understanding that neurodevelopmental disorders often occur in conjunction with other neurodevelopmental disorders as well as other psychiatric and behavioral disorders, the term “neurodivergent” serves as a fluid means of indicating general diagnosis or connection to the spectrum of neurodevelopmental disorders and their social implications (APA, 2022).

As a result, the use of the term neurodivergent helps to create a community for individuals with similar spectrum disorders without the need to constantly specify the nature of one’s disorders/conditions, sometimes without need of a formal diagnosis. For many individuals who self-identify as neurodivergent, the identity allows for inclusion in a community without need of a formal diagnosis, largely due to the complications that many face in seeking a formal diagnosis, as well as the stigma that often follows a diagnosis. To exemplify the struggles that people encounter when seeking a formal diagnosis, the way ASD is diagnosed will be examined; each disorder that falls under the neurodivergent label is different and a spectrum, so different struggles follow each disorder. ASD just serves as an excellent example for how all-encompassing these struggles can be. One of the major issues in attempting to obtain a formal diagnosis of ASD as a whole, is that entire demographics (such as women, people with atypical

symptoms, people with similar disorders, etc.) can be missed in preliminary testing, which means that adults who go undiagnosed in childhood may struggle to obtain a diagnosis. This largely stems from the “difficulty in obtaining accurate developmental history, insufficient experiences of detecting ASD among clinicians, and mild/atypical autistic traits in contrast to prominent psychiatric comorbidities,” meaning that the spectrum nature of ASD and the commonalities between ASD and other neurodevelopmental and psychiatric conditions decrease the likelihood of obtaining a diagnosis (Takara et al., 2015, p. 82). Furthermore, throughout history, the diagnostic standard for ASD has relied on the established measures used to diagnose ASD in predominantly male samples, largely overshadowing female samples and thus basing diagnosis on the symptoms that present in said male samples (Bargiela et al., 2016, p. 3282). Due to the aforementioned, “Compared to males, females are at substantially elevated risk of their [Autism Spectrum Condition (ASC)] going undiagnosed: their difficulties are frequently mislabelled or missed entirely” (Bargiela et al., 2016, p. 3281). Given the difficulties that surround obtaining formal diagnoses, many individuals who experience/relate to the known symptoms of neurodevelopmental disorders will choose to self-identify as neurodivergent, as the process of formally receiving that label can be largely inaccessible to many.

In conjunction with the inaccessibility of formal diagnosis, there still exists much negative stigma surrounding the use and label of formal diagnoses, which may impact willingness to seek a formal diagnosis. Bewley and George (2016) note that official diagnoses are not always necessary, especially in regards to awareness and support in the work place, and such diagnoses may cause more harm than good to the individual (pp. 7-

8). Johnson and Joshi (2016) further this point by noting that a neurodivergent person's decision to disclose their diagnosis "may also open up possibilities for more detrimental consequences," and that part of managing their neurodivergent identity means taking into account "potential to encounter stereotypes, discrimination, and other reactions to stigmatizing information" (p. 435). Furthermore, some neurodivergent individuals with formal diagnoses make a pointed effort to hide their diagnoses as a direct result of the negative stereotypes about their diagnosed neurodivergence. The constant knowledge of a confirmed diagnosis, and the following social vigilance in regards to that diagnosis, certainly causes individuals who identify as neurodivergent to avoid seeking a diagnosis as a means to avoid the social stereotypes and stigma that surround such a diagnosis. For this reason, this research will use participants who self-identify as neurodivergent, meaning that a formal diagnosis is not a participation requirement.

As a whole, neurodivergent individuals generally face certain barriers to social engagements as a result of the nature of their disorders. This includes "impairments of personal, social, academic, or occupational functioning," which means that at the conversational level, many neurodivergent individuals struggle with reading social cues such as audible expressions of intonation and physical expressions of emotion (and what those expressions mean in terms of the intent of the person with whom they are communicating) (APA, 2022). Castelli (2005) notes that, in the example of ASD, even individuals with no outward impairments in reading expressions of emotions in conversation likely still "have difficulties in linking the perceptual level of emotion recognition with the higher level of understanding the social meaning of different expressions" (p. 445). This means that autistic individuals who can mask the symptoms

of their neurodivergence in social settings—and who can recognize the social meaning behind emotions in conversation—still face certain struggles in understanding and interpreting the conversational intent of the people they interact with. Given these struggles when there are physical and audible cues to indicate tone and intent, it can be assumed that written communications online pose even greater challenges for neurodivergent individuals. Ergo, the existence of various tone indicators used in informal writing online serve to make communications more accessible to those who struggle with interpreting tone and intent in general as a result of neurodivergence.

In Face-to-Face (FTF) communications intent is conveyed through the consistent use of established cues, given that FTF communications allow for the added benefit of physical expressions and audible intonation (Reynolds et al., 2017, p. 2986). Online, or in digitally-based written communications, physical expression is much more difficult to express and audible intonation nearly impossible to express unless directly stated. Instructors learning to teach long-distance students through the use of the Internet have direct experience with this, with Brown and Corkill (2004) noting, “Teaching a course where there is no face-to-face contact with the learner eliminates the unspoken language of nonverbal clues that teachers use to get a feel for their classrooms,” which acknowledges that online communications largely remove the ability for communicators to take in the nonverbal cues of the people with whom they are communicating. Furthermore, in specifically written communications, there is no audible intonation to be read (unless explicitly stated), and, as Rubel and Wallace (2010) acknowledge, “Word choice reflects tone in written communication” (p. 2). It is also noted that an understanding of intent (and by extension, context) is important for understanding the

nature of a written communication as a whole, which can be difficult to express in written word alone (Rubel & Wallace, 2010, p. 2). Given the necessity for visual cue in FTF communications, tone and intent must be expressed by other means in digitally-based written communications in order to prevent miscommunication.

Considering the necessity to express tone and intent in digitally-based written communications, as language online began to develop, so too did the means to express tone and intent. Because people rely on visual cues to assume tone and intent in in-person communications, the written nature of digital communications “is inadequate for expressing nuances of meaning (e.g., sarcasm, bemusement, tentativeness, irritation) that facial expressions and/or vocal features typically convey in face-to-face spoken conversation” (Baron, 2003, p. 20). For this reason, some of the first means of denoting tone/intent (tone indicators) that developed in early online written communications were variations in text aesthetics (such as italicization, bolding, punctuation and intentional misuse of punctuation, etc.), otherwise known as typographical tone (in reference to intonation) through the use of grammatical typography. As Reynolds et al. (2017) state, when conversing in digitally-based written communications, individuals “use typographic variation to indicate pragmatic meaning, but also use it to infer intentions,” and that “certain typographical cues may push the valence of a conversation in a more positive or negative direction” (p. 2990). Additionally, McCulloch (2019) notes that “All caps, expressive lengtheninggg, ~irony punctuation~, minimalist punctuation, and capitalization paired with linebreaks” are all means (and examples) of expressing the tone of one’s voice through the grammatical typography that already existed when the Internet first came about (p. 152). Therefore, each typographical indicator of any given grammar

function can have a corresponding “tone,” and pragmatic implication, in the context of informal written communications online, outside of their assigned grammatical functions.

Alongside the spread of typographical tone came means of offering physical representations of a person’s feelings/reactions towards certain topics or messages in digitally-based written communications. These representations came in the form of emoticons and kaomojis (Baron, 2003, pp.20-21). Baron (2003) notes the following:

Emoticons are constructed by combining punctuation marks (sometimes along with characters or numerals) on the computer keyboard to represent emotions or semantic nuances such as happiness, sadness, or qualification. Among the most commonly used emoticons are

- | | |
|--------------------------|----------------------|
| :-) happiness, humor | : -o shocked, amazed |
| :-(sadness, displeasure | :(crying |
| ;-) winking | : -] sarcastic |

Although a number of emoticon lexicons have appeared (e.g., Sanderson 1993, plus an ever-changing number of emoticon pages on the Web), new emoticons can arise at any time, especially among restricted groups of users (e.g., students attending a particular high school). (pp. 20-21)

Emoticons are often used to indicate emotions related to a message exchange, either as a reaction or in conjunction with a user’s message to indicate their feelings. Similarly, kaomojis, which are an emoticon equivalent which originated in Japan, are upright “faces” used to indicate emotion by focusing on the eyes rather than the mouth like the emoticons used within the American English (Baron, 2003, p. 37). Kaomojis have since been adopted into various online groups outside of Japan as general physical expression-based tone indicators. Emojis, the natural descendent of emoticons and koamojis, came as the Internet grew, and function as a more varied option for expressing physical emotion/reaction. Given the large array of options in the kinds of reactions and expressions that emojis can offer, users have been able to provide a representation of

feelings with a “virtual body,” of sorts, which allows for another means of expressing tone and intent in written online communications (McCulloch, 2019, pp. 156-157).

The most recent addition to the options for indicating tone in digitally-based written communications can be seen in lettered tone indicators or tone tags. Attempts to make intent in speech more easily readable in written language can be seen as early as the mid-1600s when philosopher John Wilkins published an essay, wherein he tried to establish a specific typographical mark to indicate irony, with others attempting to establish marks to indicate irony throughout the following centuries (Houston, 2013, p. 212). However, largescale mainstream use of intentional tone indicators isn’t seen until 2020, specifically during the COVID-19 pandemic. Jennings-Brown (2022) notes that due to the shutdown, social media use increased rapidly, meaning that “more people now depend on digital platforms to communicate than ever before,” which in turn “has the potential to create an increase in miscommunication, which can have severe consequences.” Because of the increase in potential miscommunications, neurodivergent people online began to advocate for the use of lettered tone indicators, so as to make communications on social media to be more accessible to the community (Jennings-Brown, 2022). Lettered tone indicators have the appearance of a forward slash followed immediately by a letter representing the intent of a given message. Examples of the most common lettered tone indicators used can be seen below:

- /g, /gen – genuine, genuine question
- /genq, /gq – genuine question
- /j – joking, joke
- /hj – half-joking
- /lh – lighthearted
- /pos – positive connotation
- /neg – negative connotation

/srs – serious
/nsrs – not serious
/nm – not mad
/t – teasing
/s – sarcastic
/p – platonic
/r – romantic (Jennings-Brown, 2022; R74n. (n.d.).)

Older iterations of tone indicators that can be found in Internet speech can be seen in the mock sarcasm tag of “</sarcasm>,” which could be where the use of the forward slash in lettered tone indicators originates (McCulloch, 2019, p. 134). However, it’s difficult to pinpoint where the use of lettered tone indicators originated online due to the largely communal nature of the Internet, which causes trends and social rules to spread rapidly without a clear point of origin. Different platforms, or digital spaces, online cultivate unique groups of individuals which often allows unique features of Internet language to emerge (McCulloch, 2019, pp.64-65). Any digital space wherein Internet users can communicate using written language opens up the need for a means of indicating tone and intent, so much like the spread of trends, the creation and use of tone indicators can occur simultaneously in different groups, or be spread rapidly enough that locating a starting point is nearly impossible, simply due to the vastness of the Internet. As a result, there is no set list of lettered tone indicators from which all users pull from, though there are sets of them that are agreed upon, as shown in the above list. Different communities of practice online may use more niche lettered tone indicators—or, conversely, none at all—but on a larger scale the most common ones have spread to multiple communities across the Internet.

For the purpose of this study, written tone indicators will be referred to on the basis of their perceived level of directness. Directness and indirectness in language refers

to “the extent speakers reveal their intentions through explicit communication” (Gudykunst & Ting-Toomey, 1988, p. 100). Direct communication of tone in an exchange would involve the speaker to verbally state what the intent of their message is aloud. By this logic, it can be asserted that direct indication of tone online would be the explicit verbalization/statement of the tone of one’s message, which can be seen in the use of lettered tone indicators. Similarly, semi-directness in FTF conversations would translate to emoticons/kaomojis and emojis in digital conversations, which are a means of mimicking body language pictorially. Additionally, this means that indirect tone indicators would not explicitly state the intent of a message nor imply it through visualizations, but rather would assign certain typographical aesthetics to different intonations that can be found in conversational speech (such as the intonations associated with sarcasm, anger, sadness, happiness, etc.). Therefore, typographical tone indicators will be referred to as “indirect tone indicators,” emoticons/kaomojis and emojis will be referred to as “semi-direct tone indicators,” and lettered tone indicators (such as /j, /srs, etc.) will be referred to as “direct tone indicators.” Additionally, “tone indicators” are actually indicators of intent, but for the purpose of this study they will be referred to as tone indicators because the general public refers to the most direct of the indicators as such. For ease of understanding, all three types of indicators will be referred to as tone indicators, given the general public’s perception of them through the lens of tone rather than the lens of intent.

Tone indicators, though often overlooked, are an intrinsic aspect of Internet language, with the majority of individuals online being at the very least acquainted with emojis/emoticons due to their widespread presence. Even neurotypical individuals are

made uncomfortable when intent is difficult to identify in online communications (Akiatan et al., 2021, p. 39). According to Akiatan et al. (2021), people engaging in communications in digital spaces feel that “tone indicators avoid miscommunication and make the messages clear,” thus concluding that “tone indicators are essential to online interactions” (Akiatan et al., 2021, p. 39). If tone indicators are essential to online interactions from a neurotypical perspective, then it can be assumed that they are vital to individuals who already struggle with interpreting tone and intent outside of the Internet. Christanti et al. (2022) make it clear that neurodivergent individuals see “tone indicators as a useful communication tool,” and that they offer “clarity on the context and the purpose of the message to prevent any misunderstandings” in digital communications (p. 12). Knowledge of tone indicators as valuable tools for neurodivergent people when communicating online shows that understanding how they engage with these tools is vital to progressing the culture of the internet towards greater accessibility. Allowing a space for neurotypical individuals to learn and use direct tone indicators, as well as allowing them to grow more aware of their use of tone indicators as a whole, may be a means of “increasing accessibility of text-based communication for everyone (neurodivergent or not)” (Whitehead, 2022, p. 35).

Overall, the examination of how neurodivergent people engage with tone in digital spaces is relatively understudied. It is important to understand how people who may struggle with interpreting tone in FTF social interactions navigate interpreting it in interactions online, as the expressions of tone and intent in digital spaces is much different to how it is expressed in person. The social implications of learning and using certain tone indicators may be immeasurable, and examining the experiences of

neurodivergent individuals in digital spaces could allow for a step towards greater accessibility in language use online.

CHAPTER 3

METHODOLOGY

The data collection portion of this study began with the recruitment of four individuals above the age of 18 years old who self-identify as neurodivergent, through the use of snowball sampling. Besides the self-identification of neurodivergence, no other demographic information was collected. Four individuals were recruited to participate in this research. Each participant was asked a series of pre-established interview questions via Zoom, following a semi-structured interview format (see Figure 1).

Interview Questions

1. What kinds of digital spaces do you operate in? (text/instant messaging, social media, blog forums, etc.)
2. What aspects of neurodivergence do you identify with?
3. Have you faced any difficulties or challenges, in relation to your neurodivergence, with communications in digital spaces?
4. Are there any specific spaces that foster more challenges than others?
5. Do you feel like your communication styles differ in accordance to the different groups you engage with online? (If so, how do they differ?)
6. What are some obstacles you feel you face when trying to interpret messages from neurotypical people?
7. There are three types of tone indicators: indirect (text aesthetics, such as italicization, bolding, intentional misuse of punctuation, etc.), semi-direct (emojis/emoticons), and direct (lettered indicators, such as /srs, /j, etc.). Which of these do you engage with your day-to-day text speech?
8. Which tone indicators would you say you use most often? Why?
9. Which tone indicators best help you to understand the intention of a message? Does this vary depending on context? (If so, how does it vary?)
10. Which tone indicators would you prefer neurotypical people use when trying to convey tone to you?
11. What do you wish people knew about communicating with you in digital spaces as a neurodivergent person?
12. Are there any unique challenges that occur when communicating in digital spaces as opposed to communicating in person, and vice versa? Are there things that you find make it easier for you to interpret messages?
13. When challenges occur, are there any tools you use to try to rectify the interaction?
14. Is there anything else I should've asked? If so, please elaborate. (Essentially, is there any feedback you would like to give me?)

CHAPTER 4

RESULTS

Question 1: What kinds of digital spaces do you operate in? (text/instant messaging, social media, blog forums, etc.)

Question 1 was included in the interviews so as to allow participants the opportunity to assert their involvement in digital spaces. By answering with any given platform, they indicate that they, by proxy or as a direct result, engage with written language in digitally-based conversations. The goal of this question was to establish what connection the participants had to digital spaces.

Participant 1 indicated that they text and utilize “pretty much all the social medias,” and specified that they mainly use the platforms TikTok, Twitter, Instagram, Tumblr, and Facebook, albeit only occasionally in regards to Instagram and Facebook. Participant 1 also asserted that only post on TikTok, Twitter, and Instagram. This shows that Participant 1 regularly engages with language on these platforms.

Participant 2 stated that in terms of social media applications, they only really use Instagram and Twitter. However, they noted that for “direct conversation it’s iMessage and WhatsApp,” as well as Discord, which are all instant messaging applications/platforms. Participant 2 further stated, “I feel like I don’t really text people that much so . . . the way I interact with people is through interactions on Twitter and like mentions.” This indicates that this participant relies largely on direct communications in digital spaces, but engages with language online, regardless.

Participant 3 stated, “I have an Instagram account. Not really on it a ton, but that would be like the one social media platform I’m on,” indicating that they don’t engage

with language on social media platforms that often. That said, the third participant also indicated that they text and use Discord (a direct and group messaging platform). While this participant is not as active on social media platforms as the first two participants, they still engage with written language in digital spaces, just on a more personal level.

Participant 4 stated that they “don’t really post things,” however they stated that they text, and “use Signal, Telegram, [and] Discord.” This means that, as opposed to the other three participants, Participant 4 does not use any of the large social media platforms, but rather relies on direct messaging through various direct and group messaging platforms. Much like Participant 3, Participant 4 engages with language in digital spaces on a more personal level than most general social media platforms allow.

The common answer from the four participants is the use of texting or direct messaging.

Question 2: What aspects of neurodivergence do you identify with?

Question 2 was included in the interviews so as to allow participants the opportunity to express the facets of their neurodivergent identities. The goal of this question was to understand how the different aspects that constitute neurodivergence may have implications for the nature of engaging with tone in digital spaces.

Participant 1 stated that they most identify with ADHD and Autism under the umbrella of neurodivergence. They also stated that “there’s probably a lot more but those are the two” that they most identify with.

Participant 2 stated that they have official diagnoses for “severe Depression, severe Anxiety, high-functioning Autism, and very subtle but noticeable Tourette’s Syndrome,” and self-identify OCD and Borderline Personality Disorder (BPD), for which they are seeking official diagnoses.

Participant 3 indicated that the aspects of neurodivergence they identify with are ADD¹ and “high-functioning on the autistic spectrum.” They also stated that there may be a few others that they’ve yet to fully recognize, but in terms of identity they feel they most fall under the ADD and ASD spectrums.

Participant 4 asserted that they have ADHD, as well as Depression and Anxiety.

There is a common presence of more than one neurodivergent identity for each participant, whether in regards to true neurodevelopmental disorders, or their psychiatric/behavioral comorbidities. This serves as an example for the importance of

¹ ADD (Attention-Deficit Disorder) is another term for ADHD without hyperactivity. It was removed from the DSM in 1987, but endures in popular usage (Epstein & Loren, 2013, p. 455). In order to maintain the integrity of the participant’s answers, their use of the term was included.

“neurodivergent” as a fluid umbrella term for the spectrum of neurodevelopmental disorders and the other mental health conditions that are often connected to them.

Question 3: Have you faced any difficulties or challenges, in relation to your neurodivergence, with communications in digital spaces?

Question 3 was included in the interviews to allow the participants to express the challenges they may face in their day-to-day communications in digital spaces, specifically as neurodivergent individuals. Given that many neurodivergent people struggle with interpreting tone and intent in FTF communications, it stands to reason that these struggles would translate into digital spaces. The goal of this question was to gain an understanding of whether or not these struggles exist in the digital sphere for neurodivergent people.

Participant 1 indicated that they struggle to maintain conversations with others online, as a result of their neurodivergence, leading to them often forgetting to respond to people. However, they also stated that “in some ways it can be like kind of easier because it’s not like face-to-face,” implying that they feel that despite the challenges with communicating in digital spaces that are directly tied to their neurodivergence, the low-stakes of a conversation that isn’t face-to-face eases some of the stress associated with in-person communications. They certify this implication, stating, “I can think about my responses and like don’t have to maintain like social standards when I’m conversing with people online because I’m not physically there with them,” asserting that there’s less pressure because they don’t have to respond immediately, when communicating online. The first participant also discloses, though, that the largest difficulty for them is that the low-stakes nature of these digitally-based communications, make it difficult for them to remember to reply, as a result of their neurodivergence impacting their attention span.

Participant 2 stated that they experience difficulties with their communications in digital spaces “literally all the time.” Participant 2 further asserted:

I don't pick up on social cues in person, so it's even like worse online . . . I [make] this whole like mess in my head, and it doesn't mean anything and yeah. Just . . . any social cues, that's basically nothing.

During the interview, the participant gestured to their head miming that there wasn't understanding when they said “nothing.” Therefore, the assumption can be made that by saying “any social cues, that's basically nothing,” Participant 2 meant that they have no cognitive recognition of social cues in digital spaces. The participant also stated, during the answering of this question, that they often felt the need to message people after conversations online to apologize for any social mistakes, only to find that they had completely misread the tone and intent of the interaction.

Participant 3 stated that digital spaces can create difficulties in regards to their understanding of the intent of the person they're conversing with. They remarked, “it can be really tough sometimes to like understand people more than it is for me to like communicate myself.”

Participant 4 denoted that the challenges they face have a lot to do with “trying to word things in a way where people won't misconstrue them.” They stated that while tone is a major factor in miscommunications, it can be equally as difficult for them to try and explain the things they say, in digital spaces, without coming across aggressive. They further indicated that it is difficult for them to make things as clear as possible for the people they engage with online.

All four participants certified that they face a variety of challenges in communicating online, as a result of their neurodivergence. While each challenge is

intrinsically connected to their experiences, there exists a commonality in the struggle to interpret intent and tone. There is also a common thread between the participants in regards to how the lack of FTF interactions alters the way in which they approach communication.

Question 4: Are there any specific spaces that foster more challenges than others?

Question 4 was included in the interviews so as to allow participants the opportunity to specify the challenges they face with their communications in digital spaces. Additionally, the question was included to see if any one form of digitally-based written communication creates a more difficult to navigate environment than other spaces.

Participant 1 indicated that the platform Twitter fosters more challenges than any other the other platforms they use to communicate, largely due to the frustration of engaging with individuals they are irritated by. They stipulated, however, that the challenges in communication brought on by their use of Twitter aren't necessarily related to their neurodivergence, and are more related to the structure and userbase of the platform as a whole.

Participant 2 also stated that the platform Twitter fosters many challenges for them. They specified:

I feel like Twitter's the place where people talk the most, when it comes to social media apps, I feel like Twitter's the app where you have the most interaction with other people. And . . . that's, I feel like that's the reason why it's like almost, for me, if someone doesn't use tone indicators like it can go very bad very quickly. . . I have a lot of like trouble trying to dissect what someone said to me.

The participant further asserted that in their use of Twitter, they struggle often with interpreting the meaning behind people's messages and posts, only to later discover that there was no ill-intent or hidden meaning.

Participant 3 noted that, in terms of challenges in communicating, they struggle with "true social media, like Instagram . . . [but] wouldn't say [they] have these sorts of difficulties or like issues with texting and Discord." Additionally, this participant

indicated that the reason they don't struggle with instant messaging is due to the intentionality behind those kinds of conversations. They also note that, conversely, they struggle with "true social media" because "a social media platform is . . . like a weird point of stress almost," specifically due to the lack of intention behind the conversations that occur in communal digital spaces.

Participant 4 indicated that they don't face many struggles in their communication in digital spaces, but also stipulated that that may be a result of the tailored nature of their experiences. They asserted that they don't use social media often, and that "lot of the time the spaces that [they're] in have a demographic that's . . . similar to how [they] identify." Participant 4 reasoned that the fact that the spaces they engage in are more tailored to their identity, there are less challenges in communicating.

There was more diversity in the answers of Question 4, with one participant noting that specific digital spaces did not create more challenges than others, two participants indicating that the platform of Twitter is a much more challenging space to navigate for them than any other, and one participant explaining that social media in general creates difficulties for them. Because Twitter falls under the scope of general social media platforms, it can be stated that three of the four participants stated that social media sites create greater difficulties for communicating than personal messaging.

Question 5: Do you feel like your communication styles differ in accordance to the different groups you engage with online? (If so, how do they differ?)

Question 5 was included in the interviews as a means of understanding the approach to digitally-based communications that neurodivergent people have. The responses to this question were then intended to be analyzed in the context of the impact of neurodivergence on communication as a whole in digital spaces.

Participant 1 felt that their communication styles do differ based on the groups in which they engage online. They noted that different spaces online, as the nature of existing in those spaces, require different communication styles. They also noted that they feel that their experience in working in retail allowed them to acquire the skills to be able to effectively communicate with different groups.

Participant 2 stated that their communication styles also differ based on the groups they engage with online, specifically because of their ASD. They stated:

I mirror everyone I talk to, so it depends on the um depends on the social group I'm speaking to, and I will literally take on their jokes, their mannerisms, their inside jokes, even though I don't even know the inside jokes I will talk about them. I will just try to make myself fit in as easily and as quickly as possible.

This indicates that while this participant does change their communication style to accommodate the groups they're apart of online, it's directly tied to their neurodivergence.

Participant 3 asserted that their communication style, as a whole, does not change depending on which group they are engaging with in digital spaces. They do state, however, that their tone may differ slightly, and further note that their tone is more “performative on social media than like sending a text or Discord or something like that.”

This participant indicates that the context of a conversation, such as with whom they are conversing, may shape whether or not the conversation is surface-level. To the interviewer, this sounds like it may be a conversational style change.

Participant 4 also said that their style of communication does not change based on the groups in which they engage online. That said, they went on to state that “in a certain group [they’ll] use more slang terms, as opposed to formal language, or [they’ll] use abbreviations that they know the other people will know.” This assertion appears to be an admission of an intentional change in communication styles depending on the audience, despite the participant’s initial statement.

Two of the participants stated that they do change their communication styles based on the groups with which they communicate. The other two participants stated that they didn’t alter their communication styles, but then proceeded to offer examples and explanations of their communication styles which indicated that there is a difference for each of them. This implies that either the question was not clear enough to garner an informed response, or these two participants do not actively recognize that their communication styles vary based on the different groups they find themselves in.

Question 6: What are some obstacles you feel you face when trying to interpret messages from neurotypical people?

Question 6 was included in the interviews so as to gauge the depth of the difficulties that neurodivergent people face when communicating in digital spaces. This question was intended to allow participants the ability to express their experiences and frustrations with informal written communications, as well as the ability to articulate the potential shortcomings in digitally-based conversations.

Participant 1 stated that while they consider themselves “decent at interpreting what neurotypical people are saying,” they also admitted that it is difficult for them to understand a person’s tone online, especially when the person they are communicating with is joking or being sarcastic. They noted that because “you don’t really have tone in like text or like social media messages,” tone can be very difficult to read in written messages. This participant further asserted that they feel they struggle with interpreting written tone specifically because of their ASD.

Participant 2 expressed that they feel there’s an expectation by neurotypical people that people have a pre-understanding of the context, tone, and intent in a conversation. They expressed:

I feel like they expect you to just understand, which is fine, you’re supposed to just be able to understand things in context, but to me it’s not, there is no context. Context isn’t a thing when talking to me, you need to be very specific, and you need to be very um clear what your intentions are and what you mean by a message. The moment it gets cryptic . . . I feel like the challenge is just basic understanding. Like it’s very hard for me to just have a normal conversation without tone indicators . . . because I just . . . get confused really easily on what people mean when they speak.

This participant made it clear that the assumptions that neurotypical people tend to have in conversations regarding the level of pre-established understanding their partner in conversation has, makes it very difficult for them to manage a digitally-based conversation on any level. They asserted that they have a lot of general confusion surrounding “what people mean when they speak,” and unless people provide context during an online conversation, Participant 2 likely will not understand what is being communicated.

Participant 3 indicated that intent is very difficult for them to grasp when communicating with neurotypical people in digital spaces. They noted that sometimes when conversing, they struggle to understand why the conversation is occurring. They further indicated confusion surrounding the knowledge that neurotypical individuals appear to have, and expect their conversation partners to also have, despite no direct explanation or communication of the knowledge being shared. This participant also stipulated that “when it’s just like words on a screen, instead of like facial expressions,” it's much more difficult to reach a conclusion on what information they don't intrinsically have in a conversation.

Participant 4 noted that they struggle a lot with the subtext that exists in conversations with neurotypical people. They expressed that they feel neurotypical people “leave a lot of things unsaid, and they prefer to leave things like not spoken and they tend to not clarify what they really mean, out of politeness.” They specified that they think neurotypical people tend to “value politeness over directness,” which they feel is a major disconnection for them as a neurodivergent person. This participant indicated that

this translates into digital spaces in that it becomes even more complex due to the lack of body language and audible intonation in written communications.

In response to this question, the four participants all expressed some level of confusion surrounding interpreting tone and intent in digitally-based conversations with neurotypical people. Three of the participants also specified that they often feel like they are missing a crucial bit of information, that all neurotypical people appear to just automatically be aware of. They indicated that they feel they are expected to just know the context, intent, and tone of a conversation, without those things being clearly expressed.

Question 7: There are three types of tone indicators: indirect (text aesthetics, such as italicization, bolding, intentional misuse of punctuation, etc.), semi-direct (emojis/emoticons), and direct (lettered indicators, such as /srs, /j, etc.). Which of these do you engage with your day-to-day text speech?

Question 7 was included in the interviews so as to garner an understanding of which of the three types of tone indicators, if any, neurodivergent people engage with in written communications online.

Participant 1 stated that they use all three kinds of tone indicators, with an emphasis on indirect and semi-direct. They specified that they do not utilize direct tone indicators very often, and tend to only use them when they have the intention to be clear with messages that has the potential to not be received well. They also indicated that a reason for not using direct tone indicators is that they are not “in a ton of spaces anymore where [they] feel like it’s necessary,” asserting that they used to be more involved in spaces wherein they would be unserious or joking, and wanted the tone of those statements to be clear and come across well.

Participant 2 noted that that they use semi-direct tone indicators and direct tone indicators, but not indirect tone indicators very often. They clarified that they often don’t use indirect tone indicators because they forget what the inputs are to change the typography of written messages online (different messaging platforms have different inputs for bolding, italicizing, etc.). They also stipulated that they don’t use direct tone indicators as often as semi-direct, because the place they live is not as welcoming to neurodivergent individuals and thus does not prioritize accessibility. This participant

indicated that they use mostly semi-direct tone indicators to specify when they are joking because “there’s like no beating around the bush” with them.

Participant 3 stated that while they do use emojis, they don’t use them as tone indicators. They specifically stated, “I am an emoji user, but not in the sense they’re intended to be used, I don’t use them to like express or communicate, I just use them because I think they’re funny.” They admitted, though, that they do use both direct and indirect tone indicators, but use the indirect more than the direct. They further noted that they use indirect tone indicators because they are “very animated when [they] talk, and that’s the closest [they] can get to being text-animated,” indicating that they use tone indicators in an attempt to mimic physical expressions.

Participant 4 indicated that they use all three types of tone indicators when the opportunity arises. They specified that they used to use indirect tone indicators a lot, but use them less so nowadays due it being difficult to remember the inputs for typographical changes in messaging applications. They also stated that they use semi-direct tone indicators quite often, and that “specifically emojis with faces, those ones [they] use as tone indicators a lot,” and further stated that they use emojis that offer specific emotional expressions at face value. They added that use direct tone indicators to specify when they are joking. They noted, “I’d usually use them to convey that I am like joking, or like in a lighthearted way, mostly so that people don’t . . . take my words too seriously because I can’t convey that any other way.” They also mentioned that they use direct tone indicators with both people they know well and people they don’t know as well.

Of the four participants, two stated that they use all three types of tone indicators, while the remaining two indicated that they only use two of the three. One of the

participants who only uses two of the three indicated that they predominantly use semi-direct and direct tone indicators, and the other participant uses indirect and direct tone indicators. That said, all four participants stated that they use direct tone indicators.

Question 8: Which tone indicators would you say you use most often? Why?

Question 8 was included in the interviews to understand which tone indicators neurodivergent individuals lean towards the most in their own messages in digital spaces. This question was also intended to allow participants to break down why they may prefer to use one set of tone indicators over another, in order to conclude which indicators neurodivergent people in general may prefer.

Participant 1 made it clear that they use semi-direct tone indicators the most often of the three types. When asked why they use semi-direct indicators the most they stated:

I feel like they help get that tone across when I'm like texting or communicating on social media you know like send excessive hearts to grandparents to show all the love, or like send a like goofy silly emoji to like convey how it's . . . a silly goofy mood.

They clarified that they may feel this way because they are a “visual person, so seeing images and stuff helps with conveying . . . tone,” and because semi-direct tone indicators consist of pictographic versions of physical expressions, those indicators allow Participant 1 to express themselves visually in written communications. Additionally, they noted that because many people already know what emojis are and regularly use them, those therefore already know what emojis mean/represent, making them an effective tone indicator for wider selections of people.

Participant 2 was also forthright in stating that they use semi-direct tone indicators the most out of the three types. They cited the fact that they are a visual learner, and indicated that textual things are difficult for them to interpret in general. They specified that semi-direct tone indicators are “way easier than anything else” for them to use in their own communications.

Participant 3 asserted that they use indirect tone indicators more often than the other two types. They indicated that they used indirect tone indicators the most because they are “what feels the easiest [for them] to use.” This participant also noted that on occasion they find direct tone indicators confusing.

Participant 4 stated that the tone indicators they utilize the most often are semi-direct tone indicators, followed by direct tone indicators, and then lastly indirect tone indicators. They noted that they use semi-direct indicators the most because they are the most common. They specified that because semi-direct indicators are seen the most often, “that’s the one that’s most likely to be interpreted correctly,” especially if a conversation online is being had with a someone Participant 4 does not know as well. Additionally, this participant stated, “ideally, I would be using direct tone indicators more, because, you know, they’re direct, and that would be the ideal, but usually when I use them, I end up having to explain them,” acknowledging that they would prefer to use direct tone indicators, but making the conscious choice not to, because it feels like a waste of effort.

Three of the four participants indicated that they used semi-direct tone indicators more often than any other the other types, and the remaining participant stated that they use indirect tone indicators the most. The three participants who use semi-direct tone indicators the most all stated that they do so because those tone indicators are the ones most often used by the general public.

Question 9: Which tone indicators best help you to understand the intention of a message? Does this vary depending on context? (If so, how does it vary?)

Question 9 was included in the interviews so as to see if there is a difference between the tone indicators that the participants use and the tone indicators that help them understand the intent and tone of a message better. A difference between the tone indicators used versus the ones that help the participants the most, could imply the existence of a fissure between the needs of neurodivergent individuals and the social standards they are expected to meet in communications online.

Participant 1 indicated that semi-direct tone indicators help them to understand the intent of a message online. They stipulated, however, that certain online spaces cause the tone indicator, that helps them the most, to change. They stated, “some online spaces do use the like slash tone indicators a lot. So, I feel like those . . . tone indicators, in those spaces,” indicating that in spaces where direct tone indicators are more likely to be used, this participant would understand the intent of a message better with direct tone indicators. Participant 1 also indicated that it’s easier for them to understand what people they are well-acquainted with are saying, so there is less need to use the more direct tone indicators.

Participant 2 stated that direct tone indicators best help them to understand the intent of a message, especially because they “when someone goes through the effort to do direct tone indicators [they] know that the tone they are using is sincere, and it’s like they really mean what they’re saying.” They further noted that while they use semi-direct tone indicators the most often themselves, in practice they can be used to convey different reactions dependent on context, making direct tone indicators the clearer of the two, and

therefore the more preferable. They indicated that they “feel more comfortable using direct tone indicators with other neurodivergent people,” because the neurotypical people they have engaged with in their day-to-day life are less receptive to direct tone indicators. They also noted that they find it easier to understand direct tone indicators in serious conversations, but in more casual conversations they can successfully interpret semi-direct tone indicators.

Participant 3 stated that they feel “direct is probably just like objectively just the best option if you’re trying to be clear.” They indicated, however, that depending on context, indirect tone indicators would also help them to easily understand the intention of a message. They specified that that understanding is reliant on how much of a well-established relationship they have with the person they are communicating with. This implies that Participant 3 finds direct tone indicators to be the most helpful for understanding intent regardless of their conversation partner, but can also easily use indirect tone indicators if the person they are communicating with is someone to which they are close.

Participant 4 indicated that direct tone indicators help them the most in understanding the intent of a message. They further explain that part of the reason for this is because, in their experience, “usually people who use tone indicators are people who understand that some people just have a . . . harder time understanding tone through text . . . [are] more amenable to explaining something if [they] need.” This participant also noted that they can navigate semi-direct tone indicators when trying to understand intent in messages in general, but if they are more comfortable with being direct—with the person they are talking to—will lean towards direct tone indicators. They further stated

that direct is their “default,” implying that they have to adjust their natural communication style for it to be “acceptable” in digital spaces.

Three of the four participants stated that direct tone indicators best help them to understand the intent of a message, with the remaining participant indicating that semi-direct worked best for them. The three participants who stated that direct tone indicators help them the most, also noted that other tone indicators were acceptable depending on the context in which a conversation is occurring, with two of the three stating that semi-direct tone indicators are effective exceptions, and the remaining participant being fine with indirect tone indicators.

Question 10: Which tone indicators would you prefer neurotypical people use when trying to convey tone to you?

Question 10 was included in the interviews so as to gauge if the preference of tone indicator usage varies depending on specific people that engage with the participants. If the participants find that a certain tone indicator type makes messages easier to understand, but prefers that neurotypical people do not use that tone indicator, that could imply a disconnect between conversation styles of the neurodivergent individuals and neurotypical individuals. Conversely, if the participants prefer that neurotypical people use the same tone indicators that make it easier for the participants to understand the tone of a message, that could imply that tone indicator usage does not vary depending on audience.

Participant 1 indicated that they have no expectation for neurotypical people to use direct tone indicators, specifically because they are “newer thing that features typically in neurodivergent spaces,” and, thus, are fine with neurotypical people using semi-direct tone indicators. When given a scenario, wherein circumstances made it reasonable to expect neurotypical individuals to use direct tone indicators, Participant 1 stated that they were “not particularly attached to the lettered tone indicators,” and were still content with the use of semi-direct tone indicators by neurotypical people.

Participant 2 stated that they would prefer neurotypical people to use direct tone indicators, and even specified which direct tone indicators they wanted neurotypical people to use more often. They stated, “I feel like /serious- /srs, /j, and /sarcastic would help me so much,” listing out the tone indicators of /srs to mean a serious tone, /j to mean a joking tone, and /s (/sarcastic) to mean a sarcastic tone. This participant clarified that

because they struggle to understand when people are being sarcastic, being serious, or joking, they would like if those tones were more directly conveyed specifically written communications online, but also in in-person conversations as well.

Participant 3 noted that they would prefer neurotypical people use direct tone indicators because “you know, exactly what the context of everything is that you’re looking at.” Additionally, they specified that they would prefer neurotypical people to specifically indicate when they are being sarcastic by using “/s”. They also stated, though, that indirect tone indicators are the type they like the most because if someone is a good communicator and can express themselves effectively, there isn’t a need to clarify tone or intent, and went on to say, “if you can’t say what you’re going to say with just the words, . . . you need to talk better.” Participant 3 stated, as well, that they feel semi-direct tone indicators cause the most issues when communicating with neurotypical people because many emojis have multiple connotations, making them increasingly unclear and difficult to understand.

Participant 4 stated that they would prefer neurotypical people use direct tone indicators. They also stated that they are also comfortable with neurotypical people sticking to semi-direct tone indicators, as long as a discussion is had on what that person means when they use certain emojis. They asserted that if neurotypical people are “not amenable to [using direct tone indicators], at least talking [them] through their thought process on whatever they’re using” is necessary for Participant 4 to be able to understand the intentions of any given message.

Three of the four participants indicated that they would prefer neurotypical people use direct tone indicators in digital spaces, with the remaining participant admitting they

are comfortable with and prefer semi-direct tone indicators. Two of the three participants who indicated a preference for direct tone indicators, stated that they would also not mind if neurotypical people used other tone indicators, with one participant being okay with the use of semi-direct tone indicators, and the other participant being okay with the use of indirect tone indicators.

Question 11: What do you wish people knew about communicating with you in digital spaces as a neurodivergent person?

Question 11 was included in the interviews so as to allow the participants the opportunity to voice their desires, experiences, and ideals in regards to conversations in digital spaces, in which they may feel misunderstood. This question also served as a means to show where certain gaps in accessibility may exist in the current culture surrounding written communications in digital spaces.

Participant 1 noted that because they have not had many issues with communicating online, they are unsure if there is anything else they wish people knew about communicating with neurodivergent people in digital spaces. They did state, however, that the issues they have all occurred in situations wherein intent was not clearly expressed. They stated, “occasionally, there are times where I like wish I knew a little more context of the message,” and added that they wish people were “a little more clear with tone indication.”

Participant 2 stated that they wish people were more aware of how “dumb it makes you feel” to not understand messages or communications in digital spaces. They further asserted:

It makes you feel really, really stupid, because it’s something [that’s] supposed to just click, and literally, it’s impossible. So, I just wish they-they understand that I’m not doing this to be edgy, or quirky, or goofy, or silly. Like, I am all of those things, but I’m not doing it to be all of those things . . . it’s a struggle to just have a normal conversation. And, it’s so easy for neurotypical people to have normal conversations all the time, I just wish they understood why tone indicators are really important.

They go on to state that they wish people understood why tone indicators are important to neurodivergent people for understanding tone and intent in written conversations, and notes that it “doesn’t hurt anyone” to use tone indicators.

Participant 3 indicated that they wish people knew that they struggle to understand what people are trying to express with emojis, specifically. They also stated that they “don’t want to be treated like differently but also it would be nice if people knew” that sometimes bluntness is necessary for Participant 3 to understand what is being said. Additionally, this participant noted that they wish there was “more of an effort on that end to be direct and to the point,” and stated, again, that if people couldn’t convey what they are saying in a block of text, they should just be making a phone call instead.

Participant 4 stated that they wish people knew that directness, to them, is not rude. They specified that they would prefer if people were direct about what they mean, rather than imply something and assume Participant 4 can read between the lines and interpret that implication correctly. They also stated that, when it comes to communicating, they “would rather it be direct, because that way [they] won’t have to guess at what [people are] trying to say.”

While each participant’s response to Question 11 was rooted in their own lived experiences as neurodivergent individuals, every response indicated a desire for the general public to make clearer expressions of their tone or intent in digital spaces. One participant even expressed a desire for people to be more aware of the that struggles neurodivergent individuals face when trying to communicate in general.

Question 12: Are there any unique challenges that occur when communicating in digital spaces as opposed to communicating in person, and vice versa? Are there things that you find make it easier for you to interpret messages?

Question 12 was included in the interviews to see if neurodivergent individuals observe a clear divide between the nature of communicating in digital spaces versus in person. This question was also intended to clarify if there are things that make written messages online easier to interpret, allowing participants to indicate if tone indicators are the only things that make it easier, or if other tools exist.

Participant 1 noted that digital spaces pose a unique challenge to in-person communications in that “you don’t truly know what they mean because you don’t have that tone to go along with the message unless there are indicators.” They further specified that “online messages lack a voice,” making them difficult to interpret sometimes. They stated that semi-direct and indirect tone indicators help them to interpret messages, because they “feel like everybody’s kind of used to those,” as they are the tone indicators that have existed for a while.

Participant 2 stated that they encounter unique challenges in their online communications when transferring conversations that began in person, to digital spaces. They indicated that they are able to confidently begin a conversation in person, “but when it comes to online it kind of gets harder,” because in-person conversations are more direct than conversations that occur online. They clarified that it becomes more difficult because they “don’t know when to send what, . . . don’t know where to send it, and then [get] too scared to ask, because [they’re] supposed to know these things.” This implies that Participant 2 struggles with knowing the script for written communications online.

That said, they indicated that, in person, “facial expressions [are] very important,” and help them to read people better, thus leading to them using semi-direct tone indicators online, as they function as pictographic versions of facial expressions. Additionally, they stated that when the people they are conversing with use direct language, such as “honestly” or promising something, it is much easier for them to take in what they’re saying, and then process it.

Participant 3 indicated that they can “can go into autopilot with like a social interaction in person,” but struggle to find clarity in conversations that occur in digital spaces. They specified that there are “a lot more moving parts” with conversations online, and they can get “decision fatigue/paralysis,” wherein they struggle to make conversational decisions because there is more time to “second guess yourself.” This participant finds that what makes conversations online easiest for them, is communicating with people they know in person and with whom they have a personal relationship. They stated that they struggle to understand “relationships [that] only exist in like this digital sphere,” because “unless [they] have sort of like a flesh and blood point of reference for a person it’s really hard to get any sort of a read on them at all.” They indicated that the lack of real-world references for purely online relationships, exacerbates the difficulties that occur in the real world when navigating social interactions, “because it’s even tougher to tell like tone, motive, and things like that.”

Participant 4 stated that they find communicating in digital spaces more difficult than in-person communications, “because [they] don’t get to see all of the aspects of the person’s communicating, . . . like body language, or . . . even just hearing their voice.” They indicated that they don’t think there are any specific things that make it easier for

them to interpret a message, but instead stipulated that on some level they find digital spaces easier for communication. They specified that “because you can think things through and take longer to like formulate things, formulate thoughts, reword them, before sending it to the other person,” digital communications can be more thought out than in-person conversations.

All four of the participants indicated that a unique challenge that occurs for them when trying to communicate in a digital space, is not being able to interpret someone’s intent based on their physical or audible expressions. One of the participants specified that they struggle greatly with all the “moving parts” of online communications.

Question 13: When challenges occur, are there any tools you use to try to rectify the interaction?

Question 13 was included in the interviews to see if neurodivergent people use any specific tools to “fix” an interaction when misunderstandings or complications arise, whether those tools be tone indicators or something else.

Participant 1 stated that they will ask for clarification when challenges occur. They indicated that they are “pretty direct,” and will rely on that as a tool for rectifying miscommunications or misunderstandings. They further stated that “people usually will answer if you ask for clarification,” and have faced no issues with seeking clarification in a direct manner.

Participant 2 also stated that they will be straightforward and ask for clarification if there is a misunderstanding. They asserted that they ask for clarification both in person and in digital spaces. They also indicated that if they feel uncomfortable asking the person with whom they were interacting for clarification, they will “go to whoever was with me in the conversation,” and seek clarification and reassurance.

Participant 3 indicated that they struggle with admitting confusion, and often fail to ask for clarification, both in person and online, though they wish they could use that tool. They asserted that during in-person communications, they rely heavily on “learning to read things like body language and facial expression, and then like how a person reacts to how you’re acting.” In terms of digitally-based written communications, Participant 3 stated, “if I don’t know how to navigate a social interaction and it is not absolutely vital for me to do whatever it is, you know, message the person back or whatever, then I probably just won’t do it.” They acknowledged that their decisions to not respond to

messages that confuse them may cause people to think negatively of them, but also indicated that if the message is not important or they don't know the individual well, responding in confusion is not a priority. They also admitted that even if they have an established relationship with the individual they are conversing with online, they "will just probably get really stressed out about it, trying to figure it out," but carry on the conversation without seeking clarification. Participant 3 indicated that they wish they could use the tool of asking for clarification, but simply struggle to do so.

Participant 4 stated that when miscommunications arise, they ask for clarification. They noted that "specifically with nonverbal communication, sometimes [they] have a hard time with that," and as a result seeks clarity if they "know that like there's something that needs to be communicated," but don't know what that something is.

Three of the four participants indicated that they use the tool of asking for clarification when challenges occur in communicating, and the remaining participant expressed a desire to use that same tool, but admitted that they often struggle to do so.

Question 14: Is there anything else I should've asked? If so, please elaborate.

(Essentially, is there any feedback you would like to give me?)

Question 14 was included in the interviews so as to allow the participants the opportunity to offer any further insights they may have into the topic of neurodivergence and tone in digital spaces. This question was also used as a gauge for where other gaps in research may exist, and offer greater insight into subjects wherein further research could be beneficial.

Participant 1 suggested that research could be done on the potential connection between neurodivergence, generation of Internet user, and use of specific tone indicators. They asserted that because they “grew up online,” they grew up “kind of using like traditional emoticons and relying on like punctuation . . . to relay [their] message.” They suggested that there may be a connection between “people not adapting to newer tone indicators” and “something to do with routine and what you’re used to,” because many neurodivergent people tend to struggle with deviating from their routine. They indicated that those on the Internet who grew accustomed to semi-direct and indirect tone indicators, may be slow to adopt the use of direct tone indicators, which are much newer to the mainstream digital space.

Participant 2 took this question as an opportunity to reiterate that “it’s not that hard to use tone indicators,” and noted that they were hopeful that the use of direct tone indicators would become the norm, due to how helpful they are for the participant. They indicated that with the use of direct tone indicators, they overthink less because they know the person, they are conversing with is being both clear and genuine.

Participant 3 noted that they would have liked to have touched upon the origin of all the linguistic and social rules that exist in digital spaces. They indicated confusion around where the rules came from and why they exist online. This participant stated, “there’s just so many rules that everybody’s just supposed to know online, and it’s so hard to keep track.” They further stated that with some of the social and linguistic rules online, an individual can get by without knowing that rule, while with other rules that isn’t as possible. Participant 3 commented on the apparent “collective understanding” of social and linguistic rules both online and in person, and notes that when that collective understanding moves online, “different rules and cues” emerge. They communicated frustration with not understanding how to navigate interactions online, stating that “context is, like, most of the battle in . . . the digital space.” They expanded on this and stated:

There’s just so many different types of interactions you have, and so many of them have absolutely no like real world reference point. They’re just like, “this is a social interaction you’ve never done before, and it’s completely different from anything else you’ve ever done, go nuts.” You know?

They indicated that not having a social script for interactions is a major point of stress and confusion, and questioned where the rules that dictate these scripts came from, and why everyone is expected to automatically know and follow them.

Participant 4 did not think there was anything that was missed or not touched upon during the course of the interview.

CHAPTER 5

DISCUSSION

The experiences of the four participants interviewed during this study shed light onto the relatively understudied subject area of language as it is used on the Internet, and the accessibility of that language. Each participant expressed their own experiences, but the clear similarities between each experience cannot be overlooked. For example, all four participants voiced that a major struggle for them when interacting in digital spaces, is interpreting tone and intent in written messages. Similarly, all four participants admitted to actively using tone indicators in their day-to-day online communications, with all four participants specifying that they engage with direct tone indicators in addition to their preferred indicators. All four expressed that they wished people were clearer with their tone and intent in digital spaces, and with three of the four participants indicating that direct tone indicators help them the most when trying to determine tone or intent. Additionally, though those three participants stipulated that while they would prefer neurotypical individuals use direct tone indicators to express tone and intent, they stated that the use of semi-direct tone indicators is also more helpful than none at all.

Due to the small pool of participants used for this study, it is difficult to draw encompassing conclusions on how neurodivergent people engage with tone and intent as a whole. While the results of this study are compelling in their own right, in order for research in this subject area to have a greater statistical impact, future studies would benefit from having larger participant pools. Additionally, the choice to not include demographic information in the data collection portion of this research, while reasonable given the limitations of the study pool size, is a limitation in that certain

neurodevelopmental disorders express differently in different sexes. Therefore, were a study with a larger participant pool to take place, wherein demographic information would be collected, results could vary based specifically on the demographic information of assigned sex at birth and gender identity.

Based on the responses of the participants and the process of navigating this research as a whole, it is apparent that accessibility and the research surrounding the accessibility of language online specifically, is greatly lacking. By conducting research on these areas, the public becomes more aware of how certain decisions in social interactions can help make said interaction—and the language that accompanies them—more accessible for individuals who struggle with navigating such exchanges. Ergo, future studies could solidify the results of this study by expanding the size of the participant pool, and future studies could expand on this area of research as a whole by, for example, examining the potential differences in tone indicator usage by various generations of Internet users.

CHAPTER 6

CONCLUSIONS

It can be concluded that a more wide-spread use of direct tone indicators would make language on the Internet more broadly accessible to neurodivergent individuals. It can also be concluded that neurodivergent people generally struggle more with interpreting tone and intent in digital spaces than during in-person communications. Given that every participant indicated that they regularly engage with tone indicators in their everyday communications online, it can be concluded that tone indicators as a whole are vital to help neurodivergent individuals navigate language in digital spaces. Overall, more research needs to be explored in regards to the neurodivergent experience, and how it shapes an individual's navigation of sociolinguistic interactions in the digital sphere.

REFERENCES

- Akiatan, M. A. A., Diamante, J. C. P., Mamada, J. V. R., Puedan, M. C. G., & Malaco, A. C. (2021). The perspective of laboratory high school students on tone indicators. *Indonesian Journal of Community and Special Needs Education*, 1(1), 37-40. <https://doi.org/10.17509/ijcsne.v1i1.33390>
- American Psychiatric Association. (2022). Neurodevelopmental disorders. In Diagnostic and statistical manual of mental disorders (5th ed., text rev.). https://doi-org.ezproxy1.lib.asu.edu/10.1176/appi.books.9780890425787.x01_Neurodevelopmental_Disorders
- Bargiela, S., Steward, R., & Mandy, W. (2016). The experiences of late-diagnosed women with autism spectrum conditions: An investigation of the female autism phenotype. *Journal of Autism and Developmental Disorders*, 46(10), 3281-3294. <https://doi.org/10.1007/s10803-016-2872-8>
- Baron, N. S. (2003). Language of the Internet. In A. Farghaly (Ed.), *Handbook for language engineers* (pp. 59-127). Stanford, Calif: CSLI Publications.
- Bewley, H., & George, A. (2016). Neurodiversity at work. London: National Institute of Social and Economic Research. <https://www.niesr.ac.uk/publications/neurodiversity-work?type=report>
- Brown, W., & Corkill, P. M. (2004, April). The practice of virtual teaching: School leaders who want to teach an online college course need to be mindful of effective tricks. *School Administrator*, 61(4), 26-30.
- Castelli, F. (2005). Understanding emotions from standardized facial expressions in autism and normal development. *Autism*, 9(4), 428-449. <https://doi.org/10.1177/1362361305056082>
- Christanti, M. F., Mardani, P. B., & Fadhila, K. A. (2022). Analysing the meaning of tone indicators by neurodivergent community in Twitter. *International Journal of Social Science Research and Review*, 5(1), 5-15. <https://doi.org/10.47814/ijssrr.v5i1.118>
- Epstein, J. N., & Loren, R. E. (2013). Changes in the definition of ADHD in DSM-5: Subtle but important. *Neuropsychiatry*, 3(5), 455-458. <https://doi.org/10.2217/npv.13.59>
- Gudykunst, W. B., & Ting-Toomey, S. (1988). Culture and interpersonal communication. Newbury Park, Calif: Sage Publications.

- Houston, K. (2013). *Shady characters: The secret life of punctuation, symbols, & other typographical marks* [Kindle edition]. New York: W. W. Norton & Company.
- Jennings-Brown, F. (2022, March 16) A new way to communicate emotion has emerged: Tone indicators. *The Science Survey*.
<https://thesciencesurvey.com/news/2022/03/16/a-new-way-to-communicate-emotion-has-emerged-tone-indicators/>
- Johnson, T. D., & Joshi, A. (2016). Dark clouds or silver linings? A stigma threat perspective on the implications of an autism diagnosis for workplace well-being. *Journal of Applied Psychology*, *101*(3), 430-449.
<https://doi.org/10.1037/apl0000058>
- McCulloch, G. (2019). *Because Internet: Understanding the new rules of language*. New York: Riverhead Books.
- R74n. (n.d.). Twitter slang list. R74n. Retrieved March 15, 2023, from
<https://r74n.com/words/twitter#Tone>
- Reynolds, K., Casarotto, B., Noviski, S., & Roche, J. (2017). Using punctuation as a marker of sincerity and affective convergence during texting. *Proceedings of the 39th Annual Meeting of the Cognitive Science Society*, 2986–2991. Retrieved from <https://cogsci.mindmodeling.org/2017/papers/0565/paper0565.pdf>
- Rubel, C., & Wallace, M. (2010). Instructor tone in written communication: Are we saying what we want them to hear?. In *TCC* (pp. 1-15). *Proceedings of TCC 2010*, 1–15. TCC Hawaii. Retrieved from <https://www.learntechlib.org/p/43755/>
- Stenning, A., & Rosqvist, H. B. (2021). Neurodiversity studies: Mapping out possibilities of a new critical paradigm. *Disability & Society*, *36*(9), 1532-1537.
<https://doi.org/10.1080/09687599.2021.1919503>
- Takara, K., Kondo, T., & Kuba, T. (2015). How and why is autism spectrum disorder misdiagnosed in adult patients? From diagnostic problem to management for adjustment. *Mental Health in Family Medicine*, *11*(2), 73-88.
- Whitehead, L. N. (2022). *Thomas Sheridan, TikTok, and tone tags: Embodied elocutionary pedagogies in contemporary writing classrooms* (Master's Thesis). Miami University, Oxford, OH.

APPENDIX A

HUMAN SUBJECTS IRB APPROVAL



EXEMPTION GRANTED

Kathryn Pruitt
CLAS-H: English
480/965-7592 Kathryn.Pruitt@asu.edu

Dear [Kathryn Pruitt](#):

On 1/17/2023 the ASU IRB reviewed the following protocol:

Type of Review:	Initial Study
Title:	Neurodivergent people engaging with tone in digital spaces
Investigator:	Kathryn Pruitt
IRB ID:	STUDY00017282
Funding:	None
Grant Title:	None
Grant ID:	None
Documents Reviewed:	<ul style="list-style-type: none">• Consent form, Category: Consent Form;• Interview questions, Category: Measures (Survey questions/Interview questions /interview guides/focus group questions);• Protocol, Category: IRB Protocol;• Recruitment email, Category: Recruitment Materials;

The IRB determined that the protocol is considered exempt pursuant to Federal Regulations 45CFR46 (2)(ii) Tests, surveys, interviews, or observation (low risk) on 1/17/2023.

In conducting this protocol you are required to follow the requirements listed in the INVESTIGATOR MANUAL (HRP-103).

If any changes are made to the study, the IRB must be notified at research.integrity@asu.edu to determine if additional reviews/approvals are required. Changes may include but not limited to revisions to data collection, survey and/or interview questions, and vulnerable populations, etc.

Sincerely,

IRB Administrator

cc:

Sydney Hadden