The Effect of Digital Technology on Communication Style

Word Count: 4125

Introduction

In an increasingly digital age, people are opting to communicate online, thus decreasing both the quality, and quantity of in-person interactions. Not only is it important to be aware of the effects of digital technology on face-to-face communication, but it is important to focus on characteristics present when one is communicating in-person. Examining a link between technology usage and communication style would provide information regarding how one's digital technology usage affects aspects of their conversations.

In March of 2000, approximately 304 million people used the internet; in March of 2021, this number had risen to approximately 5.168 billion (Internet Growth Statistics, n.d.). Since 2000, the internet has led to the development of popular social media platforms, such as Facebook, Instagram, Twitter, and Snapchat. In 2002, more than 250 billion text messages were sent worldwide (Roosien, 2015). In 2020, 2.1 trillion text messages were exchanged (Anthony, n.d.). This increase of digital technology usage has led to more people choosing to stay home, since it is no longer necessary to leave home in order to communicate with others (Geladi, 2018). As digital technology becomes more, and more prominent, the quality and quantity of face-to-face communication has decreased (Drago, 2017, 13).

Those who have higher smartphone addiction are more likely to have poor mental health. For example, those with problematic smartphone usage (PSU) are more likely to have social anxiety. By interacting in an online setting more frequently than communicating in-person, people are able to avoid potentially stressful face-to-face interactions (Annoni *et al.,* 2021). Additionally, it has been found that depression severity is consistently related to PSU (Elhai *et al*., 2017), and there is a positive correlation between psychological distress, emotion

dysregulation, and PSU (Squires *et al*., 2021). A variety of issues related to mental health arise from PSU.

Although there has been copious research pertaining to the effects of digital technology on face-to-face communication, brain development, and mental health, there is a lack of research regarding the link between the amount of time spent using digital technology and its purposes with communication style. A potential reason for this is that there is a lack of scholarly literature that even refers to communication style. Upon examining a variety of sources discussing various communication styles, the greatest number of styles identified in one source was seven: assertive, aggressive, passive-aggressive, submissive, manipulative, direct, and indirect (Di Campli, 2017). Despite this, only four of these styles were investigated for this study—assertive, aggressive, passive-aggressive, and assertive. The aforementioned styles were selected because each source discussing communication style always identifies, and discusses these four styles. Additionally, most sources only identify these four styles. All previous literature studies pertaining to communication styles concur that an assertive communication style is the most effective communication style.

Assertive communicators are able to clearly state and express their needs, wants, and feelings in a respectful manner, and frequently use “I” statements. They are typically good listeners and do not interrupt others who may be speaking, and are also able to connect with others in conversation. Those who communicate in an assertive manner maintain good, comfortable eye contact, and maintain a relaxed body posture. They do not allow themselves to be abused or manipulated, and they stand up for their rights (The University of Kentucky, n.d.) (Valamis, 2022).

On the other hand, passive communicators are the opposite of assertive communicators. They are unable to assert themselves, and fail to express their needs, wants, and feelings. According to a medically reviewed article from the website Verywell Mind, passive communicators are more likely to have social anxiety, and to feel depressed or hopeless (Cuncic, 2020). Their inability to assert themselves and defend their rights builds up to passive-aggressive communication. Once their anger and resentment explodes, they will return to a passive communication style (University of Kentucky, n.d.). In no social situation is a passive-aggressive style advantageous.

In most social settings, passive-aggressive communicators are perceived as passive communicators. However, passive-aggressive communicators have an internal buildup of resentment which is acted upon in subtle ways that are not easily picked up by the average observer. Passive-aggressive communicators have difficulty acknowledging their anger and are often sarcastic. Instead of confronting people and issues, they will mutter to themselves, give the "silent treatment," spread rumors, or attempt to sabotage others' efforts. Like the passive communicator, passive-aggressive communicators find it difficult to voice their needs through healthy outlets . One with an aggressive communicator style, therefore, makes their needs clear in a hostile manner and will use intimidation and humiliation in order to control others. They frequently interrupt conversations with a demanding tone of voice and intense eye contact. They are unable to take responsibility for their own issues and are very impulsive (Alvernia University, 2018) (University of Kentucky, n.d.).

Research Questions

1. How does the amount of time spent using digital technology affect communication style?
2. How do the purposes for digital technology usage affect communication style?

Hypotheses

The inability for passive communicators to assert themselves, and the social anxiety and depression commonly accompanied with a passive communication style, in conjunction with the direct correlation between the increased usage of digital technology and poor mental health, led to the hypothesis that those who spend more time on digital technology will exhibit a passive communication style. Additionally, I hypothesized that because those with social anxiety who tend to communicate more on digital platforms do so because they believe they are only held in high regard when communicating in this manner, will also exhibit a passive-communication style. To determine the validity of this hypothesis, a survey was created using the Media Technology Usage and Attitudes Scale (Rosen *et al*., 2013), and a survey I developed to best determine the respondent's communication style. The characteristics surveyed are based upon the characteristics identified by the University of Kentucky in "The Four Basic Styles of Communication" (The University of Kentucky, n.d.). These surveys were distributed using a Google Form to an all girls, catholic single-sex school on Long Island within a three month period.

Methodology

In order to prove or disprove the hypothesis, a survey method was employed. The survey method is defined as “the collection of information from a sample of individuals through their responses to questions". By using the survey method, one can collect quantitative data, qualitative data, or both. Surveys can ask a few targeted questions to a passerby, or using multiple valids and reliable instruments. By conducting survey research, the researcher can collect data from a large group of people in a short amount of time. The survey method is best to determine the validity of the hypothesis because it will aid in determining potential correlations between the amount of time spent on a mobile device a day and purposes for its usage, and communication style. Under the communication style section of the survey, instead of providing a description of each type of communication style and asking participants to choose which one is closest to their communication style, participants are asked about characteristics regarding their own communication they notice when they are speaking. This will allow the investigation of whether more or less amounts of time, or different purposes for mobile technology usage influence which features. The type of data this method will generate is qualitative, and that will answer the research question of, “How does the amount of time spent using, and the purposes for the usage of digital technology affect communication style?”. The qualitative data generated will provide information regarding the respondent’s technology usage and communication style will allow for the examination of significance between the different variables.

An alternate research method that was considered, but ultimately rejected, was naturalistic observation. In order to execute this method, students in popular areas of socialization, such as the cafeteria, were to be observed. The observations made would have included how many students were using a device, how many were talking, and how many were

both using a device and talking. However, this method would have been ineffective for the research question because students may have noticed they were being observed and become uncomfortable with my observance for an unknown purpose. Additionally, close proximity to the students in order to determine characteristics such as the amount of eye contact in their conversation.

Participants

Students enrolled in the school's science research program will be asked to participate in this study. The targeted age range is from fourteen to eighteen years of age. The ethnicity of the county is 57.0% White, 10.6% Asian, 12.8% Black, 17.1% Hispanic, and 2.5% Other. The students attending the school identify as 74.8% White, 11.1% Asian or Asian-American, 10.1% Black or African American, and 4.0% Hispanic. Participation in this study is voluntary and no compensation will be offered to any participant.

Design

Participants will be asked to complete the Media and Technology Usage and Attitudes Scale. However, the Attitude part of this scale had been omitted from my survey because it is irrelevant to my research topic. This survey is available in the public domain and was used in "The Media and Technology Usage and Attitudes Scale: An empirical investigation" from Computers in Human Behavior (Rosen *et al.*, 2015). I have also created my own research instrument to determine the participants' communication style. There is a consent form for the parent and the participant to read together and submit prior to completing this survey.

Measures

Media and Technology Usage and Attitudes Scale. The Media and Technology Usage and Attitudes Scale is a 60 item scale that determines the primary usages of technology for each participant, and their attitudes for technology. However, I am only using the usage subscales, so I am only using 40 items. Participants respond on a 10-point frequency scale, with 1 being never and 10 being all the time. The first four items pertain to how frequently the participant does e-mail activities on any device. The next fourteen items ask for the participant to indicate how often the participants do different activities on a mobile phone. The next twelve items ask how often the participants take part in activities such as watching TV shows or movies on a TV set, or search the Internet for news on any device. The next eight items ask the participant about how often they take part in different activities on social media. The final four items ask the participant about their friends on social media and online on a nine point scale, with zero being 1 and seven-hundred fifty-one or more being 9. This scale consists of 11 subscales: smartphone usage (9 items), general social media usage (9 items), internet searching (4 items), E-Mailing (4 items), video gaming (3 items), online friendships (2 items), social media friendships (2 items), phone calling (2 items), and TV viewing (2 items) (Rosen *et al.*, 2015).

Communication Style Survey. The Communication Style Survey I have created is a 20 item survey that aims to determine if the participant communicates using a passive, aggressive, passive-aggressive, or assertive communication style. This survey presents a variety of statements and asks the participants to agree or disagree with each on a statement with 1 being "strongly disagree", and 5 being "strongly agree". The final item is a multiple choice question. The first, second, third, and fifth items help to distinguish between a passive and assertive communication style. The more the participant disagrees with these statements, the more passive a communicator the participant is. Items six and seven help to distinguish between an assertive

and an aggressive communication style. The more a participant agrees with these statements, the more aggressive a communicator the participant is. Items eight and nine are meant to aid in identifying an aggressive communicator. The more a participant agrees with these statements, the more aggressive a communicator the participant is. Items eleven, twelve, thirteen, fourteen, fifteen, sixteen, eighteen, and nineteen are meant to help identify a passive-aggressive communicator. The more a participant disagrees with these statements, the less a passive-aggressive communicator the participant is. Item seventeen is meant to help identify an assertive communicator. The more a participant agrees with this statement, the more of an assertive communicator the participant is. Item twenty asks about the tone the participant uses in conversation. Items four and ten ask about the participant's mood as they take the survey in order to help determine the credibility of this survey.

Procedures

The participant and parent(s) or guardian(s) will first provide consent before proceeding to any other section of this study. After consent is obtained, participants will fill out a demographics section. Within this section, questions have been included asking if the participant owns at least one mobile device and how long each day the participant spends using their mobile device(s). If the participant responded "no" to owning a mobile device, they are asked to discontinue participation. After completing the demographics section, they begin to fill out the Media and Technology Usage and Attitudes Scale. On the Google Form, this survey was broken into five sections. The first section asks questions regarding e-mail activities (4 items). The second section asks questions regarding activities on that participant's mobile phone (13 items). The third section asks questions regarding TV viewing, Internet usage, and interacting with people while playing video games (12 items). The fourth section first asks the participant if they

have at least one social media account. If the participant answered “no” then the participant proceeds to the communication style section. The fourth section then asks about activities the participant takes part in on social media (9 items). The fifth section asks about online friendships (4 items). Participants then complete the 20 item communication style survey I have created. After completing the communication style survey, they are debriefed and thanked for participating in my research.

Results

In order to determine the p-values, a t-test was run using online algorithms, where p is significant at less than 0.05. To determine which communication styles were most prevalent in each independent variable, the responses to each independent variable were sorted from least to greatest on a spreadsheet, and the higher averages and bottom averages were separated. The means of each communication style were found, and then a bar graph was created. Additionally, the assertive subscore was omitted; the scale was only one question.

Demographics

Figure 1 - Ethnicity of Sample

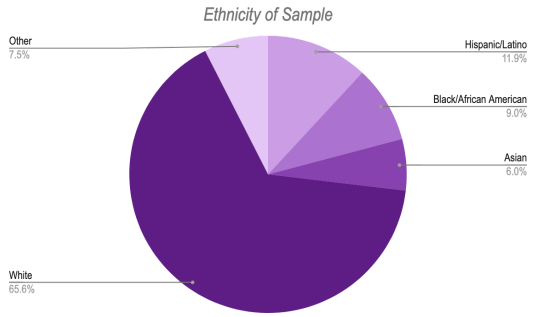


Figure 2 - Grades of Sample

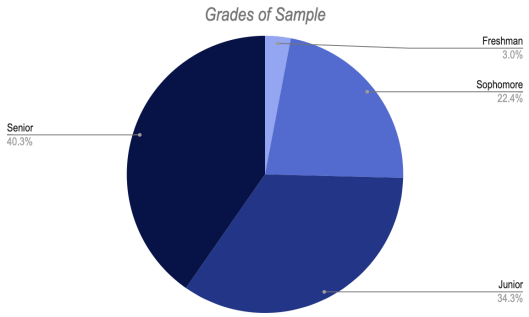


Figure 3 - Number of Devices Owned

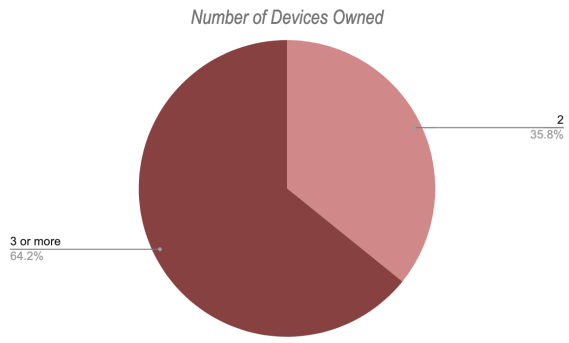
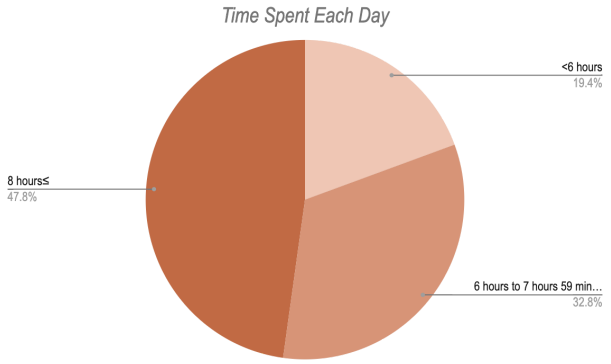


Figure 4 - Time Spent each day using devices



Means and P-values

Table 1 - Passive/Assertive p-values

	Low mean	High mean	P-values
Number of Devices	3.75	3.9	.398
Social Media Friendships	4.05	3.55	**.015**
General Social Media Usage	3.93	3.71	.270
Emailing	3.9	3.43	.596
Text Messaging	3.99	3.67	.092
Phone Calling	3.94	3.74	.299
Smartphone Usage	4.02	3.63	**.044**
TV Viewing	3.89	3.83	.755
Media Sharing	3.87	3.85	.930
Internet Searching	3.85	3.88	.922
Video Gaming	3.87	3.85	.829

When the passive/assertive dependent variable was being tested, there were two significant differences when $p<.05$: smartphone usage (0.015) and social media friendships (0.044). All other technology subscores when passive/assertive was the dependent variable were insignificant.

Table 2 - Assertive/Aggressive p-values

	Low mean	High mean	P-values
Number of Devices	3.48	3.47	.939
Social Media Friendships	3.58	3.38	.286
General Social Media Usage	3.5	3.5	1
Emailing	3.5	3.43	.596
Text Messaging	3.58	3.32	.152
Phone Calling	3.51	3.41	.569
Smartphone Usage	3.67	3.20	**.007**
TV Viewing	3.49	3.45	.838
Media Sharing	3.27	3.75	**.006**
Internet Searching	3.43	3.59	.434
Video Gaming	3.5	3.46	.820

When the assertive/aggressive dependent variable was being tested, there were two significant differences when $p<.05$: smartphone usage (0.007) and media sharing (0.006). All other technology subscores when assertive/aggressive was the dependent variable were insignificant.

Table 3 - Aggressive p-values

	Low mean	High mean	P-values
Number of Devices	2.81	3	.457
Social Media Friendships	3.14	2.86	.241
General Social Media Usage	3.17	2.86	.197
Emailing	3.01	2.81	.422
Text Messaging	3.13	2.66	.054
Phone Calling	3.12	2.68	.072
Smartphone Usage	3.12	2.68	.072
TV Viewing	3.11	2.72	.105
Media Sharing	3.10	2.70	.095
Internet Searching	3.02	2.66	.198
Video Gaming	2.98	2.91	.809

When the aggressive dependent variable was being tested, there were no significant differences.

Table 4 - Passive-Aggressive p-values

	Low mean	High mean	P-values
Number of Devices	3.13	2.95	.149
Social Media Friendships	3.04	2.94	.372
General Social Media Usage	3.06	2.89	.129
Emailing	3.06	2.95	.356
Text Messaging	3.11	2.89	.056
Phone Calling	3.05	2.96	.454
Smartphone Usage	3.04	2.98	.608
TV Viewing	3.06	2.96	.382
Media Sharing	3.06	2.95	.325
Internet Searching	3.02	2.99	.831
Video Gaming	3.14	2.96	.146

When the passive-aggressive dependent variable was being tested, there were no significant differences.

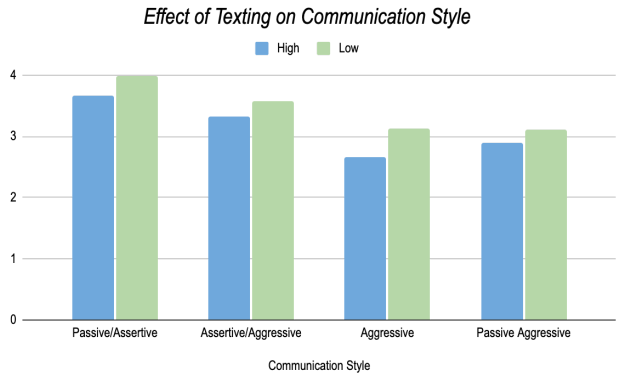
Table 5 - Time spent each day using technology p-values

	Low Mean (L)	Medium Mean (M)	High Mean (H)	L & M p-value	L & H p-value	M & H p-value
Passive/Assertive	3.62	3.86	3.95	.365	.211	.670
Assertive/Aggressive	3.23	3.25	3.72	.944	**.036**	**.009**
Aggressive	2.54	2.95	3.08	.219	.095	.657
Passive-Aggressive	2.85	3.08	3.04	.205	.162	.795

When the relationship between the amount of time spent using devices each day were compared with all communication styles, the assertive/aggressive dependent variable had two significant results ($p<0.05$): between the low and high mean values (.036), and the medium and high p-values (0.009). All other results were insignificant.

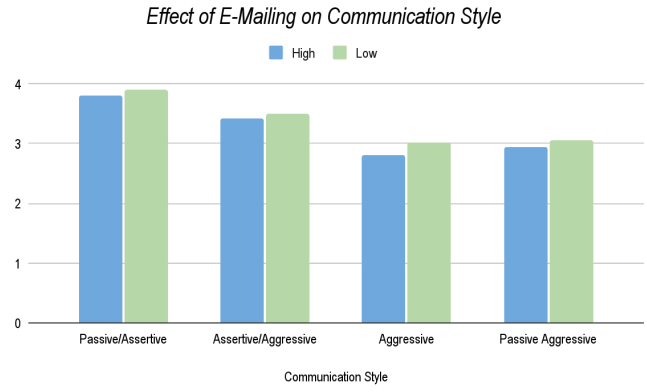
Results Directly Related to Hypotheses

Figure 5 - Effect of Texting on Communication Style



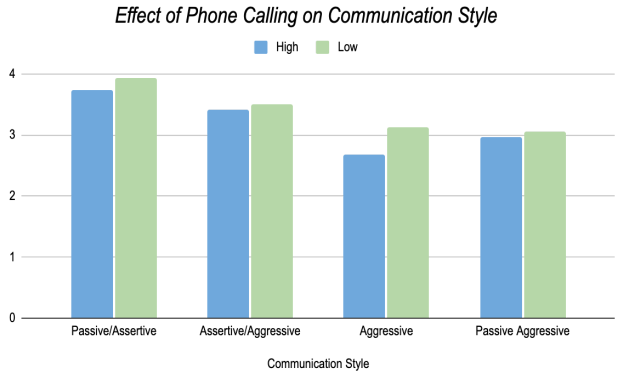
According to figure 5, when texting was the independent variable and passive/assertive was dependent, those with a lower score exhibited the most assertive tendencies, while those with a higher score exhibited less assertive tendencies.When the dependent variables were assertive/aggressive and aggressive, those with a lower texting score exhibited more aggressive tendencies, while those with a higher score exhibited less aggressive tendencies. When the dependent variable was passive-aggressive, those with a lower score exhibited more passive-aggressive tendencies, while those with a higher score exhibited less passive-aggressive tendencies.

Figure 6 - Effect of Emailing on Communication Style



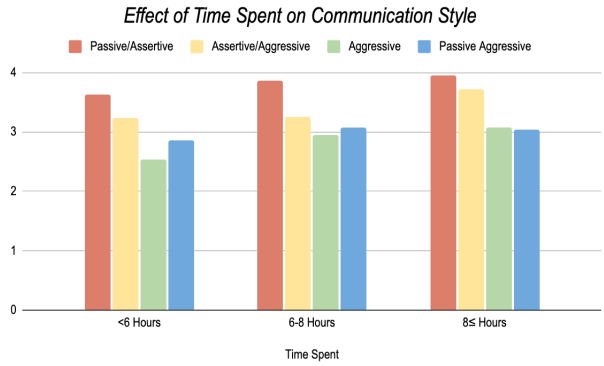
According to figure 6, when emailing was the independent variable and passive/assertive was dependent, those with a lower score exhibited the most assertive tendencies, while those with a higher score exhibited less assertive tendencies.When the dependent variables were assertive/aggressive and aggressive, those with a lower score exhibited more aggressive tendencies, while those with a higher score exhibited less aggressive tendencies. When the dependent variable was passive-aggressive, both scores were approximately the same

Figure 7 - Effect of Phone Calling on Communication Style



According to figure 7, when phone calling was the independent variable and passive/assertive was dependent, those with a lower score exhibited the most assertive tendencies, while those with a higher score exhibited less assertive tendencies. When the dependent variables were assertive/aggressive and aggressive, those with a lower score exhibited more aggressive tendencies, while those with a higher score exhibited less aggressive tendencies. When the dependent variable was passive-aggressive, both scores were approximately the same

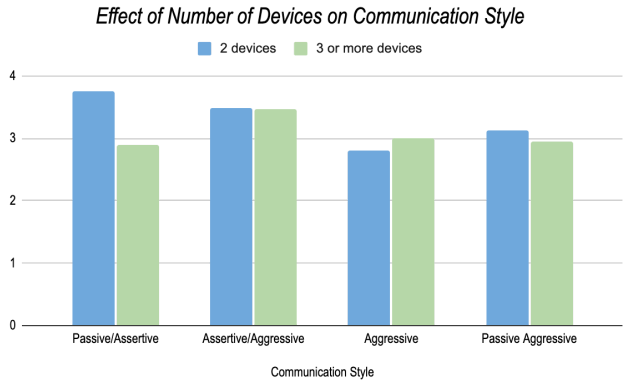
Figure 8 - Effect of Time Spent on Communication Style



According to figure 8, when the amount of time spent using digital technology was the independent variable, as the amount of time increased, so did assertiveness.

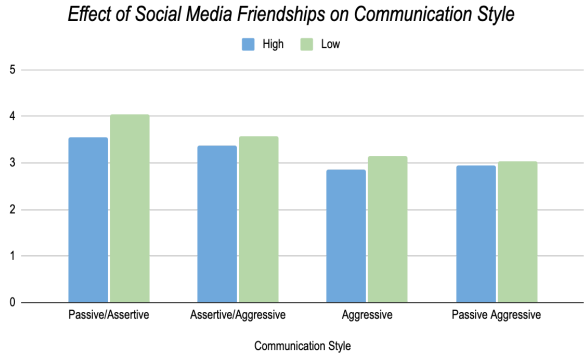
Additional Results

Figure 9 - Effect of Number of Devices Owned on Communication Style



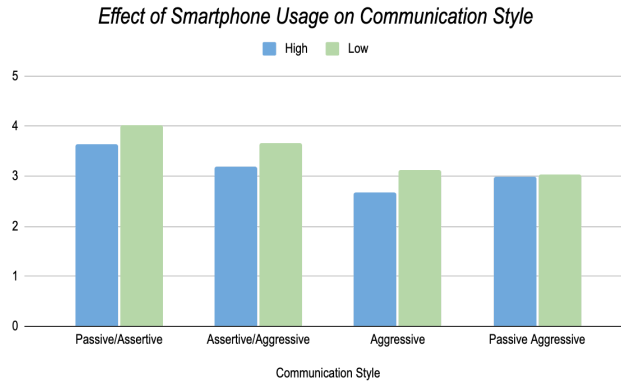
According to figure 9, when devices owned was the independent variable and passive/assertive was dependent, those who owned two devices exhibited more assertive tendencies, while those who owned 3 or more devices exhibited slightly passive tendencies. When assertive/aggressive was the dependent variable, both those who owned 2 devices and 3 or more exhibited nearly identical aggressive tendencies. When passive-aggressive was the dependent variable, those with 3 or more devices were slightly less passive aggressive than those who owned only 2 devices.

Figure 10 - Effect of Social Media Friendships on Communication Style



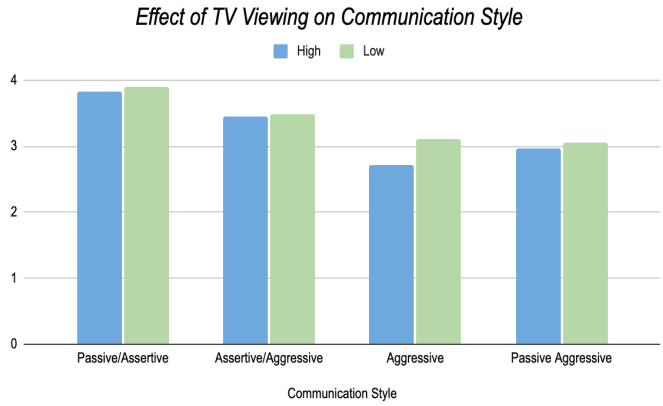
According to figure 10, when social media friendships was the independent variable and passive/assertive was dependent, those with a lower score exhibited the most assertive tendencies, while those with a higher score exhibited less assertive tendencies. When the dependent variables were assertive/aggressive and aggressive, those with a lower score exhibited more aggressive tendencies, while those with a higher score exhibited less aggressive tendencies. When the dependent variable was passive-aggressive, both scores were approximately the same

Figure 11 - Effect of Smartphone Usage on Communication Style



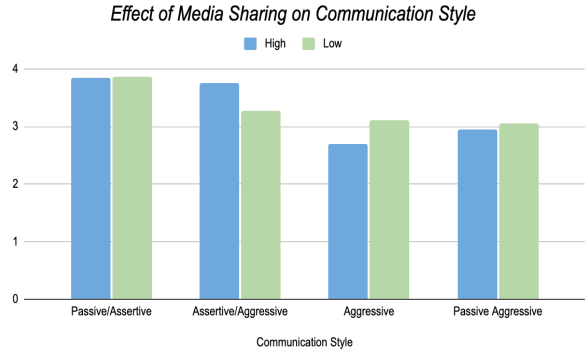
According to figure 11, when smartphone usage was the independent variable and passive/assertive was dependent, those with a lower score exhibited more assertive tendencies, while those with a higher score exhibited less assertive tendencies. When the dependent variables were assertive/aggressive and aggressive, those with a lower score exhibited more aggressive tendencies, while those with a higher score exhibited less aggressive tendencies. When the dependent variable was passive-aggressive, both scores were approximately the same

Figure 12 - Effect of TV Viewing on Communication Style



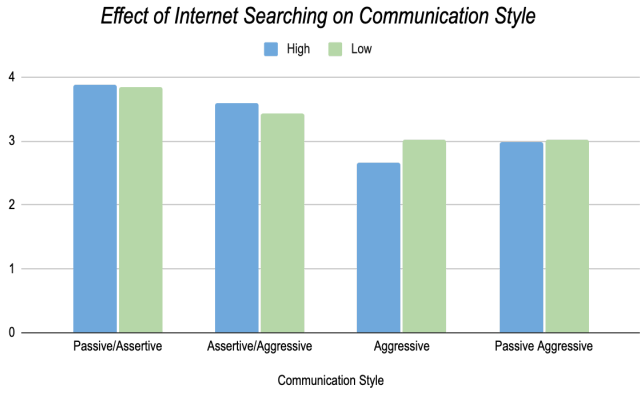
According to figure 12, when TV viewing was the independent variable and passive/assertive was dependent, those with a lower score exhibited more assertive tendencies, while those with a higher score exhibited slightly less assertive tendencies. When the dependent variable was assertive/aggressive, both scores were approximately the same. When the dependent variable was aggressive, those with a lower score exhibited more aggressive tendencies, while those with a higher score exhibited less aggressive tendencies. When the dependent variable was passive-aggressive, both scores were approximately the same

Figure 13 - Effect of Media Sharing on Communication Style



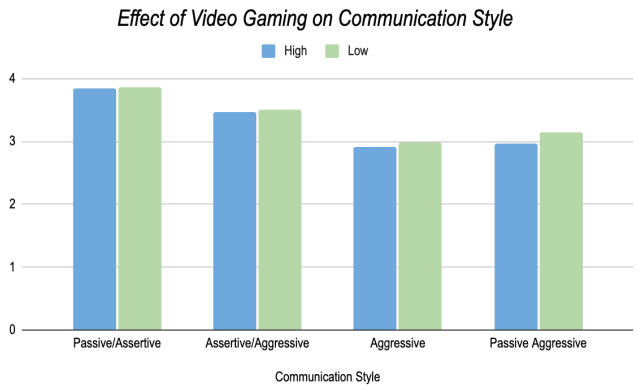
According to figure 13, when media sharing was the independent variable and passive/assertive was dependent, both scores were approximately the same. When the dependent variable was assertive/aggressive, those with a lower score were less aggressive, but those with a higher score were more aggressive. It is interesting to note that when aggressive was the dependent variable, those with a lower score were more aggressive, and those with a higher score were less aggressive. Finally, when passive-aggressive was the dependent variable, both scores were approximately the same.

Figure 14 - Effect of Internet Searching on Communication Style



According to figure 14, when media sharing was the independent variable and passive/assertive was dependent, both scores were approximately the same. When the dependent variable was assertive/aggressive, those with a lower score exhibited less aggressive tendencies but those with a higher score exhibited more aggressive tendencies. However, for when aggressive was the dependent variable, those with a lower score were more aggressive, and those with a higher score were less aggressive. Finally, when passive-aggressive was the variable, both scores were approximately the same.

Figure 15 - Effect of Video Gaming on Communication Style



According to figure 15, when video gaming was the independent variable, each communication style's scores were approximately the same.

Discussion

Hypotheses

Both hypotheses were disproved. As respondents spent more and more time using technology each day, they exhibited more assertive tendencies, despite how those who used digital technology less for communication purposes exhibited the most assertive tendencies, those who used digital technology less for communication purposes exhibited slightly less assertive tendencies, but were still assertive. The greatest degree of passive tendencies was found in those who owned three or more devices. The invalidity of my hypotheses demonstrate that greater digital technology usage may bring more assertive tendencies within individuals.

Literature

The only connection between these findings to previously conducted studies may be that beneficial effect technology sometimes has on the communication development in children. For example, in a study referenced by Jacqueline M. Kory Westlund from the Massachusetts Institute of Technology Media Laboratory, it was found that social robots may be able to be used as both learning companions, and tutors for language education in young children. These robots facilitate children learning new vocabulary in their native language or in a second language (Kory Westlund *et al.*, 2017). By learning how to communicate from as young an age as possible, children may grow to more easily assert themselves.

Additionally, television programs, specifically *Sesame Street*, create a positive effect on language development (Vulchanova *et al.*, 2017). According to the Sesame Street Curriculum, children aged three to five focus on exposure to vocabulary and everyday language, phonics, and the alphabet (Sesame Street English, n.d.). According to a study conducted by Melissa S. Kearney and Phillip B. Levine, those students who watched Sesame Street displayed improved

school performance, particularly for boys (Kearney & Levine, 2019). Therefore, *Sesame Street* displays the improvement of school performance within particularly the language development of youth aged three to five. By developing vocabulary from a young age, children will learn the most precise words to communicate their needs and wants effectively, and respectfully, just as an assertive communicator would do.

The results of this study may dispute the belief of a study led by Chen Li. In his study, "Self-Esteem and Problematic Smartphone Use Among Adolescents: A Moderated Mediation Model of Depression and Interpersonal Trust", Li states that "individuals with low self-esteem may believe that they are held in high regard only in online interactions." However, the findings of this study indicate that this is not the case. Respondents who had high scores for texting and phone calling exhibited assertive tendencies. Those with an assertive communication style tend to have a higher self esteem.

Flaw in Study

As the results for this study were being run and analyzed, it became apparent that there was a major flaw in the communication style portion of the survey. Instead of having the subscores passive/assertive, assertive/aggressive, aggressive, and passive-aggressive, they should have been passive, assertive, aggressive, and passive-aggressive. The manner in which the subscores were set up made it so the graphs could only display tendencies, and not definite styles for each independent variable. This makes it difficult to determine the validity of the results, and it makes the replication of this study significantly more difficult.

Limitations

A potential limitation within this study was that the respondents attend an all-girls Catholic school, in which every student is academically reliant upon devices. Therefore, screen times may be higher due to this academic reliance. Additionally, the purposes for digital technology usage may have been more for academic purposes than for communication purposes.

Furthermore, the school this study occurred in focuses on the cultivation of leadership in its students, which may have caused assertiveness scores to be higher, even if there was a higher amount of time spent using digital technology. Moreover, most of the people who responded to this survey were either juniors or seniors, and only 3.7% of the respondents were freshmen. Since a survey method was used, some respondents may have answered according to their own bias (Ponto, 2015). Finally, only 67 people responded to the survey, which is an inadequate sample size.

Future Avenues for Research

Before any future research can be conducted, the communication style portion of the survey must be refined, and redistributed to either the same sample, or to a new sample. In doing so, this would ensure the replicability of this study, and accuracy of the results. If this future survey is effective, an all-boys school or co-ed school could be surveyed. Finally, instead of distributing the survey to an educational institution, it could be distributed to various places of work. For example, the results of those working at an art studio compared with those working in a law firm. Technology will continue to develop for centuries, an awareness of the effect of this technology on communication style will ensure clear, effective communication.

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