

Conformity and Cognitive Load in an Asch-Like Paradigm Study

A senior thesis submitted to

The Department of Psychology College of Arts & Sciences

In partial fulfillment of the requirements for a Bachelor of Arts degree in Psychology

by

Kaylee Baker

Faculty Supervisor _____

Dr. Reed Mueller

Date

Department Chair _____

Dr. Reed Mueller

Date

Dean, College of

Arts & Sciences _____

Dr. Michael Thomas

Date

Provost _____

Dr. Michelle Cowing

Date

Concordia University

Portland, Oregon

April, 2019

Acknowledgements

I would like to acknowledge and send my sincerest thanks to the following people, who without, I would not have been able to complete and be proud of this thesis.

To Dr. Reed Mueller, who served as my faculty advisor. I would like to give thanks for your continuous invaluable insight and support throughout this process, and for helping me to be excited about my research, especially when it did not go as planned.

To my committee members, Dr. Erin Mueller and Dr. Shawn Daley. I appreciated you giving your time and efforts to provide helpful feedback and new angles to my research.

To my mom, for being the support I needed to not only accomplish a thesis, but to enjoy the ride. Thank you for helping me to realize stress only makes you stronger, and for always being a role model in my life.

To my roommates. Thank you for making me laugh when I felt like crying and for the continuous reminder that I could not only complete this, but rock this with a smile on my face, and Taco Bell in my hand.

And lastly, to Cory Main, for being my rock throughout this process and allowing me to find the light in the midst of a lot of darkness. You are truly a graceful and beautiful person, thank you for being in my life.

Table of Contents

Abstract	5
Introduction	10
Literature Review	10
Conformity	10
Cognitive load	13
Conformity and social media	14
Conformity and social identity	16
Cognitive bias and conformity	17
Cognitive load and social media	20
Effects on social behavior	21
Effects on ambiguity	22
Summary	25
Method	27
Participant characteristics	27
Data collection procedures	28
Data management and analysis	30
Results	31
Recruitment and participant flow	31
Data analysis procedures	32
Data cleaning	32
Data analysis	34
Discussion	35

Implications..... 35

Methodological strengths and limitations..... 40

Conclusion..... 43

References 45

Appendix A 52

Appendix B..... 63

Appendix C..... 65

Appendix D 68

Abstract

Objective: Conformity is an important phenomenon to examine as it has the potential to influence a vast majority of people in everyday life, especially with the current technology of social media available. Factors that affect conformity rates have had little examination in the past, but are important to note in order to fully understand this behavior of conformity. I designed this study to observe the potential effects of one such factor, cognitive load, on conformity rates in an online setting with the goal of generalizing results to the effects of social media in our contemporary society. **Design:** I devised an online survey, with two groups; an experimental group who experienced high cognitive load and a control group who experienced low cognitive load, while tasked with the rating of 10 purposefully unfunny cartoons. My study took place in an online setting using the social media platform of Facebook to gain participants in order to meet the research goal of being able to generalize results to the effects of overstimulation (a form of cognitive load) experienced with social media on conformity rates in society. **Main Outcome Measures:** I examined high cognitive load as a potential variable in increasing conformity rates to group pressure in an online setting. **Results:** My analyses showed that high cognitive load did not increase rates of conformity, and the best conclusion is that the null hypothesis cannot be rejected. I did observe a trend that high cognitive load seemed to decrease conformity rates, although the trend was not statistically significant. **Conclusion:** The results were not significant, therefore the most viable conclusion is that the null hypothesis cannot be rejected. The trend seen is discussed as potentially being related to cognitive rationing and attention theory.

Keywords: cognitive load, conformity, social media

Conformity and Cognitive Load in an Asch-like Paradigm Study

The concept of *conformity* has been defined as yielding to group pressures and influences (Crutchfield, 1955) and is a behavioral phenomenon that often occurs within our society (Bond & Smith, 1996). The implications of this behavior have been a point of curiosity for researchers, as genocides such as the Holocaust (Blass, 1998) are extreme examples of conforming behaviors. Conforming behavior can also occur in online settings, such as social media and affect macro outcomes, such as presidential elections (Ekwueme & Folarin, 2018). Thus, conformity is an issue that elicits much research, as it is both a widespread phenomenon and one that can be exploited with drastic outcomes.

In his foundational study where conformity to a group pressure was first examined, Asch (1956) used confederates to establish a group that was purposefully unanimous in their response to an unambiguous line measurement task. Further, the group answer was intentionally wrong, in order to assess the willingness of participants to conform to the wrong answer, and therefore going with the perceived social norm (Asch, 1956). Asch (1956) found that 75 percent of participants conformed at least once during this task, as shown by the willingness of the individuals to align their judgements with the apparently wrong group answer. When the participants were asked why they conformed so readily to the group's purposefully wrong answer, participants expressed a desire to not appear "peculiar" and to "fit in with the group" (Asch, 1956, p. 28). Using this seminal study, Asch (1956) suggested that a minority tends to conform to the majority, labeling this term the *majority effect*. Other researchers have concluded that conformity often occurs because of a tendency to value or trust the opinion of the group more, along with the desire to comply with the majority (e.g., Deutsch & Gerard, 1955; Kelman, 1958).

Factors such as gender, age, group size, personality, and culture have been shown to affect conformity rates in individuals (Bond, 2005; Bond & Smith, 1996; Eagly, Wood & Fishbaugh, 1981; Walker & Andrade, 1996). Yet, the question of why an individual conforms is still of concern, as there are various factors that have escaped the lenses of earlier works (e.g., personality, absence of confederates), including *cognitive load*. Cognitive load can be defined as loading the working memory (during other instruction; Sweller, 1988). In his study, Sweller (1988) observed that higher cognitive load was found to cause lower ability to attend to a stimulus and concluded that cognitive load was detrimental to cognitive processing, but the exact effects on conformity were not observed.

Whereas earlier studies failed to account for cognitive load, a recent study consisting of six individual experiments by Stein (2011) addressed this possible extraneous variable. In his fifth experiment, Stein utilized a traditional Asch-like paradigm design. Participants were asked a series of opinion-based questions, where the best option was unclear (Stein, 2011). Stein (2011) used a seven-second time limit as a cognitive load factor and provided participants with four previous participants' answers to elicit a feeling of group pressure. The answers provided were all unanimous towards the same option (Stein, 2011). Results showed that those in the high cognitive load condition (seven second time constraint) conformed more to the group answer than those in the control (no time constraint) group (Stein, 2011). With the observation of a fairly large effect size (Cohen's $d = 0.61$), this study implied that when time constraint is used as a cognitive load, conformity rates to a group tend to increase (Stein, 2011). Although a larger effect size was observed, indicating a relationship between cognitive load and the stimuli used, the stimuli used (while ambiguous) lacked ecological validity for the contemporary day. Often

overstimulation, not a time constraint constitutes cognitive load in contemporary society, as seen by an increasing amount of access to stimulus through the use of technology (Robson, 2017).

Research into cognitive load and conformity exists, but a causal relationship has not been formed that can be related to the effects of technology usage, specifically with *social media*. Social media is defined as “internet-based, disentrained and persistent channels of mass personal communication facilitating perceptions of interactions among users, deriving value primarily from user-generated content” (Carr & Hayes, 2015, p.49). This definition encompasses common social media platforms used in contemporary society, such as Facebook and Instagram (Carr & Hayes, 2015). Stein (2011) used time constraint as a cognitive load, whereas much of our society today experiences cognitive load as overstimulation from media, such as cellphones, internet usage and aforementioned social media (Robson, 2017). Robson proposed that detrimental effects of media on cognition, specifically with social media, are seen because there is little face to face social interaction, which when paired with the continuous stimulus, lessens our ability to process and store relevant information and make decisions about that information (Robson, 2017). These findings by Robson (2017) draw attention to a research gap in Stein’s (2011) study; that is, overstimulation, not a time constraint, may constitute a more ecologically valid cognitive load with regards to understanding our contemporary society.

This highlights the need for research into how the cognitive load of overstimulation (experienced through media and social media) affects the behavior of conformity. Ambiguity, referring to the unclear and opinion-based nature of a stimuli (Crutchfield,1955; Stein, 2011), is an important factor to examine as ambiguous questions regarding judgment of emotions and individual status in a group could be considered fundamental to what conformity appears as in society, and are experienced in online settings (Robson, 2017). In my study, I utilized ambiguous

stimuli, as previous studies (Asch, 1956; Deutsch & Gerard, 1955) neglected to do, while others (Crutchfield, 1955; Stein, 2011) regarded it as an essential piece of reproducing group pressure. It has been shown that with ambiguous stimuli, a higher rate of conformity to normative influence is seen (Crutchfield, 1955; Deutsch & Gerard, 1955) but the outcome of combining ambiguous stimuli and overstimulation is unknown.

For my research, I used an experimental design to create a survey that simulated group pressure, using deceit, in order to observe the effects of cognitive load on conformity rates. The survey consisted of ten cartoons, which participants rated while being exposed to group pressure and cognitive load. Group pressure was simulated by displaying five different answers while the task was being completed. Participants had been told that the incoming answers were those of others taking the survey, constituting a portion of the deceit used in my study. The other deceit portion consisted of telling participants that the survey was to investigate humor and humor styles. This was deemed necessary in order to best observe the effect of cognitive load on conformity. Cognitive load was operationalized in this study as memorization, specifically the memorization of digits. The memorization of digits was chosen as this task best replicates cognitive load in a controllable way (Sweller, 1988), and has been used in previous studies to portray a cognitive task (e.g., Allred, Crawford, Duffy & Smith, 2016; Pontari & Schlenker, 2000; Stein, 2011). High cognitive load constituted the required memorization of six digits while low cognitive load was the memorization of two digits.

In order to best replicate the overstimulation effects of social media sites such as Facebook or Instagram, I decided an online survey was the most feasible device. Ecological validity would be increased by using a survey that took place in an online setting, as social media sites are strictly online platforms. The group pressure presented by the live feed portion

attempted to mimic normative influences potentially experienced during interactions between social media users (Carr & Hayes, 2015). This study utilized humorousness ratings of cartoons to incorporate the ambiguity that has been seen as essential in testing conforming behavior (Crutchfield, 1955; Kosloff et al., 2017). I hypothesized that high cognitive load would result in a higher rate of conformity to a group when compared to a control group with low cognitive load; that is, the high cognitive load experimental group would express a higher conformity rate than the low cognitive load control group. By using these methods, I hoped to generalize results to add to the literature on how overstimulation from social media potentially contributes to rates of conformity in an online settings, such as Facebook or Instagram.

Literature Review

Conformity

The behavior of conformity can be nominally defined as changing one's actions to fit with others, in order to reach what is perceived as the correct interpretation of reality (Cialdini & Goldstein, 2004). Cardinal studies on conformity, such as Asch (1956) and Milgram (1974), have focused on the extrinsic motivations behind conformity (group influence and authority figures) whereas other studies (e.g., Burger, 1987; Deutsch & Gerard, 1995) have shown that intrinsic motivations, such as beliefs and information processing, exert the same influence on conforming behaviors. Deutsch and Gerard (1955), advancing from Asch's (1955) discovery of majority influence, concluded that two types of social influences exist (normative and informative) surrounding conformity in society.

The term *normative influence* has been explained as “an influence to conform to the positive expectations of another” (Deutsch & Gerard, 1955, p. 629). Once normative influence was defined, the majority influence discovered by Asch (1956) with his seminal line

measurement study was deemed an example of this type of influence (Deutsch & Gerard 1955). Deutsch and Gerard generalized normative influence to mean yielding to group pressure because the individual wants to fit in with the group, deeming this a more extrinsically oriented influence. *Informational influence* has been defined as “an influence to accept information obtained from another as evidence about reality” (Deutsch & Gerard, 1955, p. 629). This type of influence comes from a need to create a correct perception of reality and behave in a way that aligns with this reality (Cialdini & Goldstein, 2004). These two models of influence are essential to define in order to best replicate an accurate conforming situation within my study, as both types potentially exist in a social situation where opinion-based relations are present.

A classic example of normative influence is the concept of peer pressure, where one individual outside the group is pressured to join in on an activity or event by the group either directly or subtly (Shepherd, Lane, Tapscott, & Gentile, 2011). The individual then feels compelled to engage to become a part of the group (Shepherd et al., 2011). Peer pressure is one example of conforming behavior that can have negative outcomes, as illustrated in a study completed by Shepherd et al. (2010). In this study, researchers observed that risky driving behaviors in college students, such as speeding and failure to use turn signal, increased significantly when the driver was surrounded by pro risk confederates (pressuring to drive riskily) than when surrounded by anti risk confederates (pressuring to drive safely) or neutral confederates (no pressure; Shepard et al., 2010). Other, more extreme, outcomes include conformity to authority documented by Milgram (1974), where participants chose to conform to orders to shock another participant well past what was considered humane. During the twentieth century, some human behavior during the Holocaust depicted how conformity to an organization or norm can be violent (Blass, 2016). While social influences do not escalate often to these

levels, it is important to study normative motivations in order to understand more completely the key faculties that shape events such as the Holocaust or the concerning behavior of Milgram's (1974) participants.

Informational influence has been shown to result in problematic conformity behavior. A study completed by Williamson, Weber, and Robertson (2013) demonstrated serious impacts of this type of conformity on eyewitness behavior. Eyewitness testimonies can be susceptible to informational influence during co-witness discussions, as the individual may seek to confirm the other's story or to adapt their story because they view the other as more credible (Williamson et al., 2013). During a memory recall test, Williamson et al. (2013) found that those exposed to a source considered credible, eyewitnesses were more likely to forget or change their story to align with the source. These researchers concluded that when a witness is perceived to be more credible or have more credentials than another, informational influence is more likely to come into effect, as this type of influence is based on beliefs about reality (Williamson et al., 2013). It is important to mention these findings, as they show the effect of informational influence on memory and belief when asked about situations. This could be related to loading the working memory as with overstimulation in social media and conforming situations. Both normative and informational influences are experienced concurrently, as most social situations involve extrinsic and intrinsic motivators, such as the desire to fit in or the wish to align beliefs with a certain reality. In focusing on overall conforming behavior, this study simultaneously observed both types of influence (Cialdini & Goldstein, 2004). While often occurring at the same time, informational and normative are conceptually different (Cialdini & Goldstein, 2004). The concept of normative influence creates conforming behaviors that are motivated by extrinsic factors, such as environment and social context. Informational influence relies on intrinsic

factors, such as self-protection and confidence level about group accuracy (Cialdini & Goldstein, 2004) The ability to understand and manipulate social situations requires working memory, and therefore is vulnerable to overstimulation through cognitive load.

Cognitive Load

Cognition is the ability of the human working memory to carry out a learning task, therefore cognitive load refers to the amount and type of information presented to the working memory (Kirschner, Sweller, Kirschner, & Zambrano, 2018). Cognitive load affects the effort being used to encode information (Kirschner et al., 2018). Cognitive load theory refers to the assumption that human memory can be divided into two parts; working memory and long-term memory, and that each type encodes different information in various ways (Kirschner et al., 2018). Working memory processes incoming information and requires mental effort that can be affected by cognitive load. Long term memory takes this already processed information and commits it to storage as a schema (Sweller, 1988). Working memory is an instantaneous process and is the mechanism for controlling attention, whereas long term memory is the learning and recall portion of cognition (Klingberg, 2009).

Similar to conformity, cognitive load can be bifurcated into intrinsic and extraneous load (Sweller, 2010). *Extraneous cognitive load* refers to the way in which the information is presented to be encoded (Sweller, 2010). *Intrinsic cognitive load* is the natural complexity of the information received, and cannot be fixed or altered (Sweller, 2010). The level of complexity is defined in terms of elemental interactivity (Kirschner et al., 2010); elements are pieces of information that need to be learned (Sweller, 1998). Low elemental interactivity allows for information to be received with minimal working memory load, as the information is simplistic in nature (Sweller, 1998). High elemental interactivity consists of many interactions among

elements and creates an intricacy in the process (Sweller, 2010). Elemental interactivity is relevant, as this theory creates a channel for cognitive load to affect the working memory.

Conformity and Social Media

Cognitive load influences society in a multitude of ways. In a study completed by Pontari and Schlenker (2000), cognitive load was shown to affect self-presentation. Using 240 participants, researchers were able to conclude that high cognitive load negatively affected the ability to present the self in the desired way (Pontari & Schlenker, 2000). Participants were categorized into extraverted and introverted personality types, and then asked to present as the opposite personality during an experimental interview (Pontari & Schlenker, 2000). During the interview, those in the experimental group were given eight digits to memorize and recall which constituted the cognitive load portion, and those in the control group were given no digits (Pontari & Schlenker, 2000). Results showed the inability of those with an extroverted personality to present as introverted while under cognitive load. Conversely, participants were able to present as their true personality (extraverted) when under the same cognitive load (Pontari & Schlenker, 2000). The researchers concluded that while the inherent presentation of self was not shown to be affected by cognitive load, the desired presentation of self is affected (Pontari & Schlenker, 2000).

The platform of social media presents a unique integration of the two influences of conformity. In our contemporary society, social media allows constant access to the views and opinions of others in ways that previous generations have not seen before (Robson, 2017), allowing for both normative and informational influences to occur. Conforming behaviors from such influences can be elicited by access and usage of social media (Ekwueme & Folarin, 2018). Social media (and the consequential conforming behaviors occurring) contributed to sway the

outcome of the 2016 presidential election (Ekwueme & Folarin, 2018). This outcome shows how social media can influence behavior to elicit macro outcomes in society. Social media usage is prevalent in society as “roughly two thirds of US adults (68%) now report they are Facebook users” (Smith & Anderson, 2018, p. 1) and has increased throughout the years; in 2016, only 28% of US adults reported using Instagram, whereas almost 35% report using Instagram in 2018 (Hitlin, 2018). This increase in usage has been explained by the *uses and gratification theory*, which highlights themes behind why media formats are used (LaRose & Eastin, 2004; Whiting & Williams, 2013). LaRose and Eastin (2004) addressed media usage through this theory, positing that Bandura’s social cognitive theory combined with the unique medium of the internet offer a new format for the population to access gratifications and experience sociality.

LaRose and Eastin (2004) showed that Bandura’s six incentives for human behaviors, that is, novel sensory, social, status, monetary, enjoyable activity, and self-reactive incentives, can be applied to reasons behind social media usage and are incorporated in the uses and gratifications theory proposed. Social media exists primarily on the concept of human interaction, but without the traditional face to face communication (LaRose & Eastin, 2004). The uses and gratification theory incorporates Bandura’s six incentives for human behavior, as social media is seen as another outlet for this behavior to occur (LaRose & Eastin, 2004). Whiting and Williams (2013) took these six incentives and group them together into seven themes: social interaction, information seeking, pass time, entertainment, relaxation, communicatory utility and convenience utility. The creation of these seven themes allows for the diversity seen within human behavior to be categorized more broadly, and therefore be more generalizable to social media interaction (Whiting & Williams, 2013). These themes, along with uses and gratification theory, are essential when investigating conformity in an online setting. These studies have

shown that behaviors observed offline translate to an online setting, as online interaction is another outlet for human behavior, such as judgement, the creation of opinions and communication to occur. Therefore, it is plausible that conforming behaviors seen in experiments such as Asch's (1955) will potentially translate to an online setting. This theory also explains the reasons behind media usage, which could be contributory factors to who experiences social media influence and conformity.

Conformity and social identity. The concept of normative influence translates well onto a social media platform through the use and gratification theory (LaRose & Eastin, 2004; Whiting & Williams, 2013) and can be observed in the form of liking/friending and consistency (van Maanen & van der Vecht, 2014). As users of social media follow and like entities they enjoy, the reciprocity of the platform allows the extrinsic motivators of social and environmental contexts to take an online role (van Maanen & van der Vecht, 2014). The themes of social interaction and information seeking exhibit properties that could prime for normative and informational online influences, with conforming behaviors taking place as a result (Whiting & Williams, 2013). Conformity has been shown to influence behaviors that relate to the creation of self (Pontari & Schlenker, 2000). Social media increasingly incorporates aspects of creating social identity (Robson, 2017), as online formats are a way to express identity and act as a platform for social interaction and therefore group formation (Whiting & Williams, 2013).

Social identity is the portrayal and creation of the self. This is influenced by intrinsically related factors, such as predispositions, but also by extrinsically related factors, such as peer pressure. With the creation of media platforms, social identity can be formed both in face to face situations but also through online interactions (Meyrowitz, 1985). This aspect of the formation of social identity through a media platform could act as a priming agent to conforming behavior

because of the ambiguous nature of social media, but also because of the social pressures present online (Robson, 2017). Meyrowitz (1985) explored how electronic media, a precursor to what we currently know as social media, changed social behavior. Electronic media is defined as anything experienced electronically, which in this era was mainly television (Meyrowitz, 1985).

Electronic media allowed for an increased exposure to a variety of experiences, such as music, news, reality television, et cetera, all which are socially driven (Meyrowitz, 1985). This exposure allowed for traditional ways of social identity formation (i.e. face to face interaction) to convert into new ways of experiencing these, that is, through electronic media (Meyrowitz, 1985). Electronic media also fostered an increased connection to a growing number of groups and so “the greater the number of distinct social information-systems, the greater the possibility for establishing and maintaining clear stages of socialization into groups” (Meyrowitz, 1985, p. 150), meaning that there is an escalation of pressure to find a group and to establish an identity within that group. The trend seen with electronic media is the basis upon which many researchers have explored how social identity is influenced within social media, as the basis of what Meyrowitz (1985) coined electronic media (music, news, reality television, etc.) is thought to have been the harbinger of social media platforms that we know today (Carr & Hayes, 2015; Robson, 2017; Roda, 2011).

Cognitive biases and conformity. Other aspects of social media could be indicative of a conforming effect that usage of social media promotes. These aspects include social proof and the anonymity effect. The influence of social proof has been defined as the cognitive bias that assumes when people are portraying a behavior, then it is proof of the behavior being correct, specifically with regards to ambiguous situations (van Maanen & van der Vecht, 2014). This influence is commonly associated with social media, as it is relevant in effect to situations where

the correct behavior is not apparent, that is, using the like button on social media (van Maanen & van der Vecht, 2014). Social proof and informational influence are essentially the same concept, with a focus on evidence from others to validate (van Maanen & van der Vecht, 2014). The aspect of anonymity incorporated with an online presence also has been shown to be a portion of social media, as “online social media enable socialization through virtual communities among both people who know one another and strangers” (Wang et al., 2012, p. 199). Individuals have access to a wider variety of social input and output, while maintaining (if desired) a relatively anonymous online existence (Wang et al., 2012).

While some researchers (Tyson & Kaplowitz, 1977; Meyrowitz, 1985) have theorized that anonymity decreases the desire to align attitudes with the group, others have argued that the ubiquitous and identity focused setting that social media allows counteracts this hypothesis (Hardy, 1957; Postmes & Lea, 2000). Postmes and Lea (2000) completed a meta-analysis of studies concerning anonymity and impact of group on decision making and concluded that the “performance in decision making groups depends on the social context and relevant social norms as well as on system characteristics such as anonymity” (p. 1270). This finding showed that the effects of remaining anonymous in a group are prone to change as the social context in which the group exists changes as well. This study highlighted how the various social contexts of social media and the reasons behind usage both contribute to the effect anonymity has on conforming behavior (Postmes & Lea, 2000). The results of the meta-analysis also showed that a possible priming for conformity takes place in social media, as the social norms and influences on social media gravitate towards individuals having the ability to contribute to platforms without identification (i.e., fake accounts or account under alias), allowing for a fluid social identity to exist (Postmes & Lea, 2000).

This ability to remain anonymous in online settings has been shown to affect how social identity is formed in social media settings such as Facebook or Instagram (Postmes & Lea, 2000). Zhu and Huberman (2014) found that people's opinions were greatly influenced by observing others in an online format. This is important to note, as social media is influencing opinions, which are factors in contributing to social identity formation, while continuing to allow for anonymity to occur (Postmes and Lea, 2000). Using the online format of a ranking website, Zhu and Huberman (2014) tested change in opinion when exposed to other's opinion. The experimental group was exposed to a set of pictures, then immediately asked to give another ranking of the same set of pictures, but this time with exposure to the differing opinions of other participants (Zhu & Huberman, 2014).

The control group followed the same format as the experimental group, with the only changed variable was an added time constraint to represent social pressure (Zhu & Huberman, 2014). Those in the experimental group were given a short interval of time to respond to the second set of pictures whereas those in the control group were given a long interval (Zhu & Huberman, 2014). Social influence and conformity rates were measured by whether or not individuals switched their rankings after seeing other differing opinions (Zhu & Huberman, 2014). Results showed that those in both the groups, regardless of time interval, changed their opinion on the set of pictures (Zhu & Huberman, 2014). This study highlights that exposure to a group consensus, when regarding rankings and opinion in an online format, was a significant factor in conforming to the group.

Both social proof and informational influence are relevant within ambiguous situations, and social proof is similar enough to informational influence to represent this motivation in an online format (van Maanen & van de Vecht, 2014; Cialdini & Goldstein, 2004). This is

important to note, as social media not only incorporates traditional social influences, but creates another type of influence: social proof (van Maanen & van de Vecht, 2014). As social media usage is ubiquitous in contemporary society, the exposure to social influences becomes increasingly prevalent as well. By using the social proof influence as a constituent for informational influence, conformity can be studied in an online (specifically social media) aspect and incorporate the critical pieces of normative and informational motivators (van Maanen & van de Vecht, 2014; Cialdini & Goldstein, 2004). With regards to cognitive load, social media can represent the concept of overstimulation that is constant in our society. By integrating social influences and cognitive load, the effect of social media can be studied.

Cognitive Load and Social Media

Along with social influences, aspects of cognitive load are also represented on social media platforms and contribute to the effect of social media on society. In the context of social media, cognitive load is present as overstimulation, defined as the constant access to social information, and is otherwise known as high element interactivity (Robson, 2017; Sweller, 2010). Biologically, cognitive processing is effective only to a certain point. When the level of elemental interactivity exceeds the attention and effort needed to fully encode the information, the brain has to selectively choose what information is coded into long term memory schemas (Klingberg, 2009). This is problematic as much information is missed and the attention to the information is divided (Klingberg, 2009). Robson (2017) suggested that because of this division, the ability to concentrate on one aspect is difficult, as the brain is being bombarded with new stimulus to encode. An example of overstimulation is advertisements, a common occurrence on social media websites such as Facebook or Instagram. The main effort is given to consuming the material presented on the social media webpage, but when advertisements are occurring

simultaneously, the brain must divide attention and thus creates a distraction task that limits the working memory and the ability to encode (Klingberg, 2009). The ability to retain information is key when completing a number of tasks, therefore overstimulation can affect not only conformity, but other behaviors such as the ability to form judgments and self-presentations well (Klingberg, 2009).

Effect on social behavior. Conformity and cognitive load both have been shown to exert effects upon social behaviors. A gap in the research exists, however, with regards to the influence of cognitive load upon conformity and vice versa. Many studies have compiled factors that have been shown to alter conforming behaviors. Walker and Andrade (1996) found that conformity decreased with age. Various amounts of age groups were used, ranging from three to five-year-olds to fifteen- to seventeen-year-olds (Walker & Andrade, 1996). Conformity to unambiguous stimuli was highest in the age group three to five compared to those aged between fifteen to seventeen years, showing that age affects conforming behavior (Walker & Andrade, 1996). Other characteristics of individuals, such as personality (Kosloff et al., 2017) and gender (Eagly et al., 1981) determine conforming behaviors as well. Kosloff et al. (2017) found that individuals with a higher meta trait of stability conform the most when compared to individuals with other traits. Eagly et al. (1981) found that women conformed more than men, but only when women believed their opinions would be announced to the group. These studies show that conformity can be correctly linked to certain interpersonal traits, such as gender, personality and age.

Other researchers (e.g., Bond, 2005; Bond & Smith, 1996; Mori & Arai, 2010) have found that intrapersonal factors, such as culture, type of interaction, and unanimity influence conformity rates as well. Bond and Smith's (1996) meta-analysis showed that collectivistic

cultures tended to conform more to group norms and opinions than individualistic cultures. Bond (2005) found that conformity to a group consensus was higher in individuals whose opinion would be made public than those whose opinion would be private. Mori and Arai's (2010) replication of the Asch line study (Asch, 1956) found that the use of a unanimous majority answer showed the same conformity rates as the use of a divided majority answer. These researchers (Bond & Smith, 1996; Bond, 2005; Mori & Arai, 2010) concluded that intrapersonal factors, as well as interpersonal factors influence conforming behaviors, but cognitive load is undiscovered as an affective variable.

When considering cognitive load as a causal factor in conforming behavior, especially with regards to social media, ambiguity is an important factor, as almost all of social media is opinion based (Robson, 2017). Ambiguity is essential when studying the effects of conformity as well, as many studies have found an increase in conformity when regarding ambiguous stimuli (Crutchfield, 1955; Stein, 2011; Hardy 1957). Ambiguous stimuli are necessary when studying social media, as they best represent the type of informational conformity seen on social media websites (Robson, 2017). The ambiguous quality of social media is seen by the diverse interactions that can take place as well as the many platforms for judgement and opinion formation to take place (i.e. likes on Instagram) (Robson, 2017).

Effect of ambiguity. For the purpose of this study, *ambiguous stimuli* was defined as stimuli that elicited “turning from perceptual and factual judgements (unambiguous) to opinions and attitude” (Crutchfield, 1955, p. 193). Many researchers (eg., Stein, 2011; Crutchfield, 1955) have posited that ambiguity is essential when studying conformity. In an Asch-like study, Crutchfield (1955) introduced the concept of ambiguous (opinion-based) stimuli as fundamental in measuring conformity to the group (Crutchfield, 1955). Crutchfield (1955) administered 21

slides of both unambiguous and ambiguous stimuli to a group of 50 men. The men were isolated in cubicles, where their only knowledge of the group consensus were lighted buttons showing the “group” answers (Crutchfield, 1955). These “group” answers were actually the experimenter pressing pre-defined button patterns in order to provide a situation where the participant would have to decide between going with his own judgement or following the opinion of the group. From this experiment, Crutchfield (1955) discovered that 79 percent of individuals conformed to the group consensus in ambiguous situations compared to only 30 percent in unambiguous ones. This study is considered seminal as these results indicated that conformity occurs more frequently when concerned with opinions (ambiguous situations) and adds to the previous research on normative and informational influence as causes of a majority of conforming behaviors.

Stein (2011) completed six studies pertaining to conformity and ambiguous stimuli, as well as cognitive load. Across these studies, ambiguous stimuli were used to create a model of autonomic conformity, as Stein (2011) posited that conformity to ambiguous stimuli is a natural response whereas non-conformity is a secondary effortful act. Most relevant to my research are studies five and six in Stein’s program of research. In study five of Stein’s (2011) study on conformity, 58 participants were asked six ambiguous questions (i.e., Would you rather have a BMW or Mercedes Benz luxury car?) that were written to purposefully elicit an either-or response. Participants were split into two groups, control and experimental, with the experimental group receiving a cognitive load (operationalized as a seven second time constraint) and the control group receiving no cognitive load (in the form of no time constraint) (Stein, 2011). After answering each question, the participants were exposed to the majority’s answer and then asked the question again (Stein, 2011), with measures put into place in order to

lower suspicion about the true nature of the study. Results showed that after exposure to the majority answer, those in the experimental group changed their answer to match the majority (i.e. conforming behavior) more than those in the control group (Stein, 2011). These results postulated that when under a cognitive load, individuals rely more on group influence when in an ambiguous situation (Stein, 2011), which reflected the findings of ambiguity influencing conformity in Crutchfield's (1955) study.

In study six, an Asch-like paradigm was used in order to test whether Asch's original findings held when other elements, such as cognitive load, were present (Stein, 2011). In Asch (1956), the results showed that when presented with a united majority in an evidently wrong answer and an unambiguous line measurement task, individuals would conform with the group's answer. Study six of Stein (2011) recreated the group circumstances but added a cognitive load, as well as a priming agent in the form of financial incentive to not conform. The task given was to correct a series of sentences according to grammar rules (Stein, 2011). Participants were split into two groups, with the experimental group receiving a cognitive load of eight-digit memorization and the control a two-digit memorization. Previous to the distribution of the task, participants were informed that if their tallies were within two of the actual number of grammatically incorrect sentences, they would receive a five-dollar gift card. The financial incentive remained the same across both groups.

Sixty-six participants were given 21 sentences to tally as correct or incorrect. After the participants completed the first sentence correction, they were given the task of memorizing either a two (control group) or eight (experimental group) digit number as high or low cognitive load (Stein, 2011). A second task of the same grammar correction was then administered, but participants were first exposed to the group tallies, all of which were purposefully wrong,

meaning sentences that were apparently grammatically correct were tallied as incorrect (Stein, 2011). Results showed that those in the high cognitive load group (experimental group) conformed more readily to the group answers than those experiencing low cognitive load (control group), even with the financial incentive to not conform. These results postulated that cognitive load could be a highly influential factor in conformity, although it is necessary to isolate and test only cognitive load, as this study by Stein (2011) neglected to do so. These studies highlighted how ambiguous stimuli, compared to unambiguous stimuli elicit a differential response in conforming behaviors, as well as the need for deeper research into cognitive load as a causal factor of conformity. Studies completed by Crutchfield (1955) and Stein (2011) also showed that research into conforming behaviors should incorporate ambiguous stimuli, as conforming behavior occurs with this type of stimuli.

Using ambiguous stimuli allows for the element of informational influence found in social media platforms to be represented. In our contemporary society, social interaction can be experienced both with face to face contact, but also the more isolated contact of interaction over technology outlets. Basic social interaction consists of individuals conveying and understanding ideas, thoughts, and identities through behaviors (Pontari & Schlenker, 2000). It is through the working memory portion of cognitive load that this is able to happen (Sweller, 2010). It could be possible then that the function of cognitive load is the same in all social interactions, including those that take place in an online setting.

Summary

Conformity, in both normative and informational types, has been shown to be motivated by extrinsic and intrinsic factors. Both types of conformity have been observed on social media platforms and have also been linked to the development of social identity both on and offline.

Working memory, defined as the capacity attend to, understand, and act upon our environment, includes susceptibility to conforming factors. Cognitive load is a process that is known to load the working memory, and therefore influence the processes incorporated within the working memory which include attention allocation. Cognitive load could also encapsulate overstimulation, as overstimulation is defined as an overload of information into the working memory from outside sources. While technology has positively impacted society by means of easier access to information and advancements in society, researchers have also noted the aversive effects on cognition of online interaction, via overstimulation effects.

This overstimulation could increase conformity in online settings. Online interactions present an overload of information on the human brain, as the contemporary society experiences constant access to a diverse number and type of stimuli (Robson, 2017). This could result in social media eliciting conforming behavior that affects macro outcomes, such as the 2016 presidential election. Conformity in an online setting also creates the issues of cognitive biases by phenomenon such as social proofing and the anonymity factor of online usage. The problem with the advancement of technology is as technology can improve at an ever-changing rate, our cognition is limited by the simple biology of the brain, as the human brain can only process and store so much information (Klingberg, 2009). When the brain experiences overstimulation, working memory is affected and therefore the ability to attend to stimuli, such as social interaction, is influenced (Robson, 2017).

My survey was distributed in an online setting to mimic this overstimulation effect and to be able to generalize any results found to social media. From the research found, I hypothesized that a higher cognitive load would increase rates of conformity to group pressure, as cognitive load has been shown to affect the working memory, and therefore limit the amount of cognitive

resources allocated to accomplishing the tasks given in my experiment. Cognitive load could impact conformity rates since this variable limits the amount of cognitive resources available, and therefore there is less accessible to complete tasks given in the experimental survey. This could potentially increase rates of conformity since cognitive resources would be limited, so ability to create decisions about ambiguous stimuli could be limited as well. Susceptibility to group pressure could be increased as there are less cognitive resources available to resist such pressure, which could increase rates of conformity to the pressure experienced.

Method

Participant Characteristics

The population of study were users of social media, specifically Facebook, who were over the age of 18. For this study, participants were recruited via a survey link (Appendix A) posted to Facebook from the primary researcher's personal account. Access to this population was available as the primary researcher currently uses this social media platform. Those recruited were connected with the primary investigator or other users on social media who were connected to the primary investigator. Those who followed the personal account could share the link, which allowed for a larger sample size.

Only individuals over the age of 18 were allowed to participate in this study. The survey prompted possible participants to confirm they were 18 years of age or older and allowed only those who answered yes to move onto the rest of the study. Those who are able to access the survey after completing review and agreement to an informed consent screen were enrolled in the study. The above measures helped to exclude any potential vulnerable populations from participating in the study. Participants were not included or excluded based on any other demographic other than age. Out of a total of 43 participants, ages ranged from 18 years to 61

years, with the majority of individuals being between 20 to 22 years of age (60.50%).

Demographic analyses indicated that the majority of participants were Caucasian (79.10%) and female (76.70%). Other demographic results show that participants tended to be a part of the Christian religion (51.20%). It should be noted that demographic percentages were calculated from available data and are not indicative of the entire participant population. Some individuals declined to answer demographic questions, but their results from the experimental portion of the survey were used in data analyses.

Data Collection Procedures

Target sample size for the study was informed by a power analysis for an independent samples *t* test with alpha at 0.05 and beta at 0.80. Using these parameters, the target sample size was 80 participants; a study with 80 participants would be sufficient to detect an effect size of about 0.5, which is typical in recent conformity studies (Bond, 2005; Stein, 2011). At 80 participants, with beta at 0.80 and alpha at 0.05, the minimum effect size detected was 0.56. This was a single site collection effort using a snowball sampling strategy. Data for this study were collected in a strictly online setting, using a survey designed on Qualtrics. The vehicle of the social media website Facebook was used to recruit participants.

Participants were recruited using Facebook as a social media platform to post an anonymous survey link. Recruitment began January 21st of 2019 and ended February 15th of 2019. Using an anonymous link created using Qualtrics Distribution tools, access to the study was made available to qualifying participants through a status update on Facebook from my personal account. Participants were able to access this link either directly from the personal post or from the shared link of the post by other users. Individuals were only able to interact with the post by clicking on the link to the survey in order to complete the study. The commenting feature

of Facebook was dismantled for the purpose of protecting both the participant privacy and the validity of the study. Along with the survey link, the status update provided a brief overview of what participation entailed and encouraged participation in the study. Participants clicked on the link available which directed them to the Qualtrics survey page that was used to collect the data. Once the link was activated, individuals were asked to complete a consent page, in the form of click to consent and age verification page (Appendix B). Prior to beginning the study, participants were unknowingly assigned to either the control or experimental group, using the Qualtrics random assignment tool. Participants then began the research portion of the study.

Following Kosloff et al (2017) procedure, participants were at first informed that this study is on what makes a cartoon funny or not. Individuals were then asked to fill out a questionnaire that is a combination of questions on humor styles and the individual's demographics (Appendix C). The questionnaire used was designed by Dr. Spee Kosloff and was provided for use in this study via email by Dr. Spee Kosloff. The questions constituting the humor styles portion were modified to fit the purposes of this study and were used to increase the believability of the proposed reason behind the study. This portion of the deception was necessary for the study and follows other studies on conformity that commonly use deception as a standard element (Kosloff et al., 2017; Bond, 2005; Crutchfield, 1955), dating back to Asch (1956). Participants were not aware of the real reason behind the study until they were debriefed at the end of the survey.

Participants were informed that the study featured a live feed, where their answers would be shown to others, and they would be able to see other participant's current answers. This element constituted another portion of the deception. In actuality, the group answers were predetermined numbers put forth by the researcher that portrayed the seemingly non-humorous

cartoon as very humorous on the provided scale of 1 to 100. This deception was necessary in order to produce a realistic representation of normative influence to elicit participants' conforming or non-conforming responses. Patterns seen between normative influence and humorousness ratings could exhibit the effect of cognitive load. The cartoon set, and proceedings of the experiment, were taken from Kosloff et al. (2017) study on conformity.

Dependent on the group assignment, participants were asked to remember a series of numbers as an essential portion of the study. This memorization task represented the cognitive load aspect of the study. Participants were given one set of digits at the beginning of the survey and were asked to remember this set throughout the survey. Those in the control group received a series of two digits and those in the experimental group received a series of six digits.

Individuals were instructed to evaluate a set of 10 unfunny cartoons, one at a time, for level of humor. Humorousness ratings were provided on a scale of one to 100, with 100 being the funniest. Group answers, which participants were led to believe were real time answers from other participants, were shown for each cartoon. At the end of evaluating each of the cartoons, participants were asked to recall and report the set of digits given at the beginning.

After presentation of all stimuli and digit recall tasks, participants were debriefed on the real reason behind the study and informed of the deceit (Appendix D). Participants were given an option to withdraw at any point, using a click to submit option. If this option was not selected, data was marked as incomplete. Data was deleted and not used for analysis if not marked as one hundred percent complete on Qualtrics. Contact information for both the researcher and the faculty advisor was provided to participants at the end of the survey in case of need to withdraw. The participants were reminded of their right to withdraw at the beginning and the end of the

study. In order to protect the validity of the research, commenting for the primary Facebook post was turned off.

Data Management and Analysis

The data collected consisted of the participant's 10 cartoon ratings and demographic questions. Participant responses were collected using Qualtrics and the resulting dataset was analyzed using SPSS. The ability to recall the digit sets and the answers to the humorousness questionnaire were not collected, as per Kosloff et al. (2017) procedures. Data were collected and kept on record with the faculty advisor and researcher. Consent forms will be kept for a period of three years by the faculty advisor. After the dependent variable was assessed against statistical assumptions, an independent samples *t* test of the two groups (control versus experimental) was conducted to test the significance of cognitive load on conformity rates. Statistical tests and comparison took place on the software SPSS. Only the researcher and the faculty advisor have access to data on Qualtrics. Data are currently being stored on a password protected computer, located in the faculty advisor's office or in the possession of the researcher.

This was a minimal risk study. No foreseeable discomforts were associated with this study, other than possible discomfort at being deceived for a portion of time while participating in the experiment. This proposed study incorporated methods and materials used by Kosloff et al. (2017) to add to the literature on conformity and to address the research gap found concerning cognitive load and conformity. Results of this study could be generalized to understand the aversive effects of overstimulation that our modern society experiences. No compensation was offered to the participants. The cost of this study included ten to fifteen minutes of the participant's time.

Results

Recruitment and Participant Flow

Participants were randomly assigned using Qualtrics random assignment block function to either the control condition (Group one) or the experimental condition (Group two). The control condition experienced low cognitive load in the form of rehearsal of two digits and the experimental condition experienced high cognitive load in the form of rehearsal of six digits. Demographic information was collected from participants prior to the experimental portion of the survey. After being randomly distributed into the two groups, participants gave ratings of 10 different cartoons, while being exposed to group pressure via a simulated live feed. Ratings were given on a scale of one to one hundred. To end the survey, participants were asked to recall the digits given at the beginning of the survey, and then debriefed on the true nature of the experimental survey. At the conclusion of these efforts, the experiment had a total of 58 participants. After the completion of the survey, individual ratings were analyzed to create a mean humor rating for each participant, which served as the dependent variable for the statistical tests.

Data Analysis Procedures

Data cleaning. Subsequent to the conclusion of all recruiting efforts, the dataset was reviewed with regard to the frequency of missing data, resulting in 15 participant response sets being manually deleted because of participant failure to complete the full questionnaire. Responses were deleted if a) respondents failed to view the study debrief or b) completed less than 90 percent of the humor ratings. Twenty-five percent of total responses were deleted because of failure to complete at least 90 percent of the humor ratings and less than one percent were deleted due to failure to view the study debrief. A total of eight response sets that were

incomplete (i.e. not answering all humor ratings) but only failed to complete one rating set were included in the data analysis.

Prior to hypothesis testing, the resulting dataset was assessed using the Little's Missing Completely at Random test (MCAR; Newton, Cox, Baum, Beck & Bellocco, 2013). This test analyzes incomplete data to discern whether data is missing for reasons such as systemic issues with the survey or because of participant influences (Jo, Ginexi & Lalongo, 2010). Data were deemed MCAR ($X^2_{(36)} = 33.62, p = 0.58$) and therefore were incorporated into final data analysis. Data deemed MCAR is available for inclusion into data analysis as the test constitutes that the incomplete data is not a systemic error with the survey, postulating that the survey design was not a factor contributing to incomplete data (Jo, Ginexi & Lalongo, 2010). Little's test of MCAR was calculated in the software STATA, using the Little's test of MCAR code (Newton et al., 2013). Since the data was statistically seen to be MCAR, methods to deal with the missing data could be used, as data that is MCAR is an assumption that must be met in order to for missing data methods to be carried out (Jo, Ginexi & Lalongo, 2010, Acock, 2005).

A pairwise deletion method was deemed the most direct method in order to calculate the means of the eight responses that had missing data. Pairwise deletion was found to be the most effective at incorporating the highest number of responses and lowering the risk of biases for the data being analyzed. Other options for dealing with missing data included listwise deletion, mean substitution and imputation and regression methods (Acock, 2005; Shrive, Stuart, Quan & Ghali, 2006), but these were eliminated in favor of pairwise deletion for the following reasons.

Listwise deletion was ruled out as the sample size for this study was small and preserving data was important to keep statistical power intact because it "typically results in 20 – 50% loss of data" (Acock, 2005, p. 1015) and is best used with large sample sizes as the cost of data loss

to small sample sizes outweighs the benefits of this method (Acock, 2005). Mean substitution was precluded as it has been found to bias results when used with opinion-based data consistent with the type sought in this experiment (Acock, 2005). Furthermore, as the current study relies directly on testing the relationship of cognitive load to the opinion of cartoons, imputation and regression methods were not considered as each rating was treated as independent of the next, so no patterns could be established in order to predict what the participant would rate the cartoon (Shrive et al., 2006).

As a result of these data cleaning procedures, a total of 43 participants were included in final statistical tests. Thus, pairwise deletion was achieved by summing the scores of all humor ratings and then dividing the results by number of questions completed (i.e., if a respondent answered nine out of ten questions, the sum of ratings would only be divided by nine).

Data analysis. I hypothesized that individuals in the experimental group who experienced high cognitive load would have higher conformity rates than individuals in the control group who experienced low cognitive load. Leven's Test for Equality of Variances was not significant ($p = 0.108$), which suggested that equal variances could be assumed. Group differences on mean humor ratings were then tested in SPSS using a one-tailed independent samples t test. Results were not significant ($t_{42} = 1.02, p = 0.108$); thus, the null hypothesis cannot be rejected. Those in the control group ($M = 58.60, SD = 19.26$) did not differ significantly from individuals in the experimental group ($M = 51.56, SD = 25.85$). The frequency distribution of the humor responses was negatively skewed (skewness of $-0.65, SE = 0.36$) and platykurtic (kurtosis of $-0.70, SE = .71$). Although results were negatively skewed and platykurtic, suggesting a violation of normal distribution expectations, the ANOVA appears to be

robust even with evidence of a violation present (Norman, 2010), allowing for the use of parametric tests such as the ones utilized in this study.

Though not statistically significant, a medium effect size was observed ($d = 0.32$). This effect size is important to note as this could indicate a trend in the opposite direction predicted by my hypothesis. This trend could imply that individuals who experienced high cognitive load could be less likely to conform to group pressure than those who experienced low cognitive load; given the effect size, it seems plausible that such an effect would have been significant had my sample size more adequately conformed to sample size parameters of the power analysis.

Discussion

The goal of this study was to add to the research on conformity by testing whether cognitive load would increase rates of conformity to a group pressure, specifically in an online format. Another aim of this study was to have the ability to generalize results to modern day social media usage. I tested my hypothesis using an online experimental survey with two groups: experimental and control. The experimental group received the high cognitive load condition (six digits to memorize) and the control group received the low cognitive load condition (two digits to memorize). I hypothesized that those in the experimental group (high cognitive load) would conform more readily to the group pressure than those in the control group (low cognitive load) while in an online setting. The results of this study, as discussed above, were not significant, but one trend emerged that deserves exploration, as it could be a variable that impacted my results and that warrant additional exploring in later research. Results showed a trend towards significance, but in the opposite direction of my primary hypothesis. One could argue that this trend suggests that high cognitive load had a potential paradoxical effect on conformity rates;

where high cognitive load possibly decreased conformity rates, not increased rates as hypothesized. Results were not significant, indicating also that the null hypothesis could be true.

Implications

In considering these results, two implications merit consideration: (a) the function of cognitive load on attention and attention on conformity in an online setting and (b) the possibility that the null hypothesis is correct. I will address these considerations below.

The trend observed, though not at a degree that was statistically significant, was that those in the control group (low cognitive load) were more susceptible to group influence than those in the experimental group (high cognitive load), which was the opposite of the pattern hypothesized. This trend is as predicted by limited cognition and attention theories. It is assumed from substantial research that the human brain has a finite limit on the capacity to perform cognitive functions (Klingberg, 2009; Roda, 2011) known most commonly as the theory of *limited cognitive resources* (Kahneman, 1973). The theory of limited cognition resources implies that each of these functions takes a certain amount of cognitive resources in order to be carried out, therefore only a few acts of cognition can happen simultaneously (Kahneman, 1973). This process of selection is referred to as *cognitive rationing*, which is the act of allocating cognitive energy to various cognitive tasks (Roda, 2011). Cognitive resources include abilities such as comprehension, perception, judgement, recall, etc. (Roda, 2011). This study required multiple cognitive acts such as judgement, perception, and recall [seen by the participant's ratings of the cartoons (judgement and perception) and memorization and participant citing of digits (recall)].

As there are multiple cognitive functions that were simultaneously necessary to complete this survey, it could be assumed that cognitive rationing was taking place. This could explain the trend of difference seen between the high cognitive load group and the low cognitive load group

as those in the high cognitive load group with six digits to rehearse would have had to exert more cognitive effort towards recall than the low cognitive load group. Therefore, participants would be using more cognitive resources in the experimental group than those in the control group. As a result, there were likely fewer cognitive resources available for those memorizing six digits (experimental group) to put towards processing and attending to the incoming group pressure, which is consistent with limited cognitive resources theory and the act of cognitive rationing.

Attention serves an important role by being the directive process behind such cognitive rationing, and therefore the driving force behind the execution of cognitive tasks (Johnson & Proctor, 2004; Kahneman, 1973; Roda, 2011). The process of attention and the related distribution of cognitive resources are known to take place within the working memory (Johnson & Proctor, 2004; Kahneman, 1973; Roda, 2011). Working memory has been previously discussed in my literature review since cognitive load is known to directly affect the working memory (Kirschner et al., 2018; Sweller, 2010). Attention is a dominant attribute within the working memory as it “guides the allocation of cognitive and physical resources and allows us to perceive and act upon stimulation received” (Roda, 2011, p. 13). While being a major process within the working memory, attention is also a cognitive resource, meaning it too is limited in quantity. Cognitive load affects the working memory because it is processed there (Kirschner et al., 2018; Mattek et al., 2016), where attention direction and distribution also take place (Johnson & Proctor, 2004; Roda, 2011).

While taking the survey, participants’ working memories were acting to distribute cognitive resources by directing attention to stimuli received such as the digits given and the task of rating the cartoons. This would mean that a participant’s attention, as well as ability to judge and perceive the cartoon, were allocated based off of their available cognitive resources.

Decreasing the amount of resources available by increasing cognitive load could explain the trend seen between the two groups. The top down model of attention adds weight to this explanation, as this theory states that attention is directed based off of ranking the tasks given to the working memory in order of relevance to completion of said task (Roda, 2011; Zhang, 2013). This endogenous model of attention distribution creates an executive system, where stimuli is ranked sequentially by importance to the task at hand (Roda, 2011). The top down theory of attention could explain the trend observed. The received cognitive load inhibited the amount of resources available to the participant which then resulted in the cognitive need to allocate resources.

According the top down model, attention was then allocated based off of relevance to the task at hand, so participants would have allocated more of their cognitive resources to the two tasks received: memorization of digits and judgment of the cartoons. This would mean that those in the high cognitive load group would have had less attention and resources directed at processing the incoming group data then those in the low cognitive group, as the relevance of the group data would have been ranked as low since it was not directly stated that these were important to complete the assignment given. Their resources were instead consumed with the directed activity of rating the cartoon and the memorization of digits, as these two tasks were explicitly stated in survey directions as being important to the completion of the survey. Those in the low cognitive group would have had more resources for the group answers to enter into the working memory than those in the high cognitive group. Although not statistically significant, the trend towards those in the experimental group (high cognitive load) being less susceptible to group pressure than those in the control group (low cognitive load) therefore could be explained by a combination of the theory of limited cognitive resources, cognitive rationing, and the top

down attention model. This interaction explains how the working memory allocated attention differently when experiencing disparate amount of cognitive load.

A second consideration is that the null is the most parsimonious explanation for these results observed in my study. The null hypothesis states that there is no effect of cognitive load on conformity in this experiment. Although previous research conducted supported my hypothesis that cognitive load could have an effect on conformity rates, results show that this relationship was not found within the current study. Results showed no significant differences between conformity rates between the control group and the experimental group. These results are inconsistent with other studies that used cognitive load as a variable to test conformity. Stein (2011) found that cognitive load operationalized as a time constraint created a higher conformity rate to group pressure than those not under cognitive load. This experimental study however, was completed in an online setting where participants were potentially isolated in their own spaces, whereas Stein (2011) designed the study to be executed in a common space, where participants were face to face with other participants, as well as the experimenter. The differences between the platforms (face to face versus online) could have contributed to the unseen effect of cognitive load on conformity rates in my experimental study. Future research should be partaken in order to study how an online platform affects conformity rates; whether it reinforces conforming behavior or not.

To date, there are numerous studies discussing the influence of overstimulation (a form of cognitive load) experienced online on social behavior. However, others suggest that there is a possibility that our brains, while overstimulated, are more impacted by other variables that influence social behavior (including conformity), such as habitual online usage (LaRose & Eastin, 2004; Wu & Cheng, 2019). Technology usage has greatly increased in our society,

leading to the constant practice of social media usage (LaRose & Eastin, 2004). This has led to habitual online usage, especially with social media, which in turn, could allow for our brains to accept the consistency of overstimulation (from being online) as part of everyday life (LaRose & Eastin, 2004; Wu & Cheng, 2019). This habitual online usage dictates online behavior as it becomes integrated into routine, which allows for the brain to pay less attention to the task of being online (Wu & Cheng, 2019). This could affect how participants perceived the cognitive load in the survey, potentially allowing for the individuals to ignore the cognitive load experienced, as habitual online usage has previously allowed them to do. Other variables, such as the discussed habitual online usage, that exert a stronger force on social behavior (including conformity) could conclude that while cognitive load is experienced, it does not have an effect on conformity rates specifically while in an online setting. This conclusion could support the non-significant results seen with this study as the most accurate explanation to accepting that the null hypothesis is true.

Methodological strengths and limitations

One strength of this study included a large age spectrum. Participant ages ranged from 18 years of age to 61 years of age, which highlights the generalizability of my results across a considerable age range. As social media usage has increased in all age groups (Hitlin, 2018), the large age range of participants enhanced the generalizability. An additional strength of this study was the design and format of the experimental platform. This study combined variables, such as cognitive load and conformity, in an online setting to observe the effects of cognitive load on conformity. The survey design attempted to create a subtle but real time feedback experience pulling for conformity. Participants were exposed to incoming group ratings that were timed to appear at certain intervals while the individual was completing their rating. Previous to the

current study, these variables had not been observed in relation to one another in an online setting. By using this design and format, this study added a new dimension to research into the effects on cognitive load and conformity. The use of a real time group pressure added external validity to observing conformity rates, but this variable could be improved in further research. In my experimental survey, group ratings were displayed, but were accompanied by the page blinking when a new rating was displayed. The real time feedback portion could be improved by eliminating this blinking to make the group pressure more subtle, further increasing the external validity of this study.

One limitation experienced in this study was a small sample size. Based upon my a priori power analysis, my target sample size was 80; however, response to the invitation to participate in the study, was not that robust. Additionally, 15 responses had to be deleted because they were incomplete to such an extent, they did not meet my inclusion threshold. Thus, the final analysis incorporated responses from only 43 participants, which was significantly lower than my target sample size; the study was underpowered. Taking these observations into account, were I to replicate this study, I would add a feature that required all questions to be answered in order to move forward in the survey. This would have limited the number of incomplete responses and would have increased my sample size.

Low general response rate was another weakness causing the small sample size, and could be avoided in future research by using other social media platforms (i.e., Twitter, Instagram) or online settings (i.e., email, text messages) to recruit participants. These additional recruitment methods would allow for more individuals to be reached without hindering the online basis of this experiment. Another limitation noted was the lack of ability to account for certain outside influences, such as the discussed theory of limited cognitive resources, cognitive

rationing and the top down attention model. Results observed could have been impacted by any of the above, as discussed previously in this thesis. Therefore, it could be difficult to discern whether results seen were directly related to the influence of cognitive load.

An aim of this study was to examine, and perhaps generalize, results related to effects of overstimulation (operationalized in this study as cognitive load) and experienced through social media on conforming behavior, as conformity rates in an online setting is an area that could be problematic. This goal of generalization to social media was attempted by using an online immediate-access setting, complete with perceived outside opinions to conduct my experimental, which was meant to parallel the experience of social media. Participants also entered the experiment while on personally accessed devices, not provided by the researcher, which contributes to the parallel of social media and the experiment reported herein. The analogy of my online survey to that of a social media platform such as Facebook or Instagram was not a perfect attempt, and elicits another limitation of my study. Social media was defined earlier as being “internet-based, disentrained and persistent channels” (Carr & Hayes, 2015, p.49) meaning where interaction and value association would take place. My survey, although online, potentially did not accurately represent the interaction aspect of social media.

Research has shown that the ambiguous quality of online interactions could enhance conformity in the individual experiencing the group pressure (Pontari & Schlenker, 2000) but also that the interpersonal factors present in online settings (i.e., personality, perceived status) could potentially increase conformity rates (Whiting & Williams, 2013). The analogy of this survey to social media could be augmented by adding interpersonal factors to the group pressure in order to observe whether this has an impact on conformity rates, and to better mimic social media. Participants in the survey did not specifically interact with those they perceived as

exhibiting the group pressure, and as mentioned above, no interpersonal attributes were present. Although not an exact replication of what social media sites entail, my online experimental study presents an digital and non local normative influence design that attempts to depict the anonymity and social pressure experienced while using social media (Carr & Hayes, 2015; Robson, 2017). While not a concise analogy of a social media site, results could potentially be generalized to the specific aspects of social media sites, such as normative influence and the online setting, that were analogous in my survey design.

Conclusion

The goal of this study was to add to the research on conformity and test whether cognitive load would increase conformity to a group pressure, specifically in an online setting. Another aim of this research was to be able to generalize results to social media usage, using a parallel experience of an digital and non local online survey that attempted to imitate normative influence. I tested this using an online experimental survey with two groups. I hypothesized that those in the experimental group (high cognitive load) would conform more readily to the group pressure than those in the control group (low cognitive load) while in an online setting; however, the trends, even though not significant, were in the opposite direction than hypothesized. Although results of this study were not significant, it is important to note a trend of the data towards significance in the opposite direction of my hypothesis as one potential avenue for future research. The theory of limited cognitive resources, cognitive rationing and the top down model of attention were explored as possible explanations to the trends observed. Finally, the possibility that null is true and was rightly accepted, is still further fertile ground for future exploration.

Future research should be conducted using a larger sample size with regards to relationships between social media, cognitive load and conformity and the above-mentioned factors, as it is an area that impacts much of our society. Demographic questions were answered previous to exposure to the experimental portion of the survey. These questions included prompts about race, ethnicity, age and gender. Analysis of these variables in contrast to results were not included in this study but could have had an effect on results. Future research should be completed observing possible effects of demographic variables on conformity rates, as this could be important when talking about social media usage and conforming behavior. A more analogous model of social media should be incorporated into any future research, as this was one limitation observed in my study. Conformity to social pressures has been shown to occur in a variety of settings, such as during completion of a driving task and in online experiences (Shepard et al., 2011& Wang et al., 2012). With the increasing popularity of social media usage, it can be reasoned that conformity will continue to occur in an online setting (Wang et al., 2012; Zhu & Huberman, 2014). Hopefully, future studies will continue to explore this idea as it could be a factor in conformity, especially in a contemporary society where many of our interactions involving ambiguous stimuli occur online.

References

- Acock, A. C. (2005). Working with missing values. *Journal of Marriage and Family*, 67(4), 1012-1028. doi:110.1111/j.1741-3737.2005.00191.x
- Allred, S.R., Crawford, E., Duffy, S. & Smith, J. (2016). Working memory and spatial judgements: Cognitive load increases the central tendency bias. *Psychonomic Bulletin & Review*, 23(6), 1825-1831. <http://dx.doi.org/10.3758/s13423-016-1039-0>
- Asch, S. E. (1956). Studies of independence and conformity: I. A minority of one against a unanimous majority. *Psychological Monographs*, 70(9), 1–70.
<http://dx.doi.org/10.1037/h0093718>
- Bargh, J. & Chartrand, T. (1999). The unbearable automaticity of being. *American Psychologist*, 54(7), 462-479. <http://dx.doi.org/10.1037/0003-066X.54.7.462>
- Blass, T. (1998). The roots of Stanley Milgram's obedience experiments and their relevance to the Holocaust. *Analyse & Kritik*, 20(1), 46 – 53. <https://doi.org/10.1515/auk-1998-0103>
- Bond, R., & Smith, P. B. (1996). Culture and conformity: A meta-analysis of studies using Asch's (1952b, 1956) line judgment task. *Psychological Bulletin*, 119(1), 111–137.
Retrieved from
https://search.proquest.com/docview/57369416?rfr_id=info%3Axri%2Fsid%3Aprimo
- Bond, R. (2005). Group size and conformity. *Group Processes & Intergroup Relations*, 8(4), 331–354. <https://doi.org/10.1177/1368430205056464>
- Burger, J. M. (1987). Desire for control and conformity to a perceived norm. *Journal of Personality and Social Psychology*, 53(2), 355-360. Retrieved from
https://search.proquest.com/docview/209828430?rfr_id=info%3Axri%2Fsid%3Aprimo

- Carr, C., & Hayes, R. (2015) Social media: Defining, developing and divining. *Atlantic Journal of Communication*, 23(1), 46-65. <https://doi.org/10.1080/15456870.2015.972282>
- Chater, N., Felin, T., Funder, D., Gigerenzer, G., Koenderink, J., Krueger, J.,... Todd, P. (2018). *Psychonomic Bulletin & Review*, 25(2), 793-826. <https://doi.org/10.3758/s13423-017-1333-5>
- Chaxel, A. (2014). The impact of procedural priming of selective accessibility on self-generated and experimenter-provided anchors. *Journal of Experimental Social Psychology*, 50(1), 45-51. <http://dx.doi.org/10.1016/j.jesp.2013.09.005>
- Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annual Review of Psychology*, 55, 591-621. doi: 10.1146/annurev.psych.55.090902.142015
- Crutchfield, R. S. (1955). Conformity and character. *American Psychologist*, 10(5), 191–198.
- Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *Journal of Abnormal and Social Psychology*, 51(3), 629–636.
Retrieved from
https://search.proquest.com/docview/37683249?rfr_id=info%3Axri%2Fsid%3Aprimo
- Eagly, A. H., Wood, W., & Fishbaugh, L. (1981). Sex differences in conformity: Surveillance by the group as a determinant of male nonconformity. *Journal of Personality and Social Psychology*, 40(2), 384–394. Retrieved from
https://search.proquest.com/docview/1295944975?rfr_id=info%3Axri%2Fsid%3Aprimo
- Ekwueme, M., & Folarin, S. (2018). Social media and electioneering: The case of the United States 2016 presidential election. *Acta Univeristy of Danubius International Relations*, 11(1), 54-68. Retrieved from

<http://cupdx.idm.oclc.org/login?url=https://search.proquest.com/docview/2118386848?accountid=10248>

- Furnham, A. & Boo, H. (2011). A literature review of the anchoring effect. *The Journal of Socio-Economics*, 40(1), 35-42. doi: 10.1016/j.socec.2010.10.008
- Gibson, J. L. (1992). The political consequences of intolerance: Cultural conformity and political freedom. *The American Political Science Review; Washington*, 86(2), 338-356. Retrieved from <https://search.proquest.com/docview/214427575/abstract/AA0B52C27353459BPQ/1>
- Hardy, K. R. (1957). Determinants of conformity and attitude change. *The Journal of Abnormal and Social Psychology*, 54(3), 289–294. <http://dx.doi.org/10.1037/h0048374>
- Hitlin, P. (2018, November). Use of internet, social media, digital devices plateau in US. Retrieved from <http://www.pewresearch.org/fact-tank/2018/09/28/internet-social-media-use-and-device-ownership-in-u-s-have-plateaued-after-years-of-growth/>
- Jo, B., Ginexi, E. & Lalongo, N. (2010). Handling missing data in randomized experiments with noncompliance. *Prevention Science*, 11(4), 384-396. doi: 10.1007/s11121-010-0175-4
- Johnson, A. & Proctor, R. (2004). *Attention: Theory and practice*. Thousand Oaks, CA: SAGE Publications, Inc.
- Kelman, H. C. (1958). Compliance, identification, and internalization: Three processes of attitude change. *Journal of Conflict Resolution*, 2(1), 51–60. Retrieved from <https://search.proquest.com/docview/235698617/abstract/1B0204A529D94861PQ/1>
- Kirschner, P. A., Sweller, J., Kirschner, F., & Zambrano R., J. (2018). From cognitive load theory to collaborative cognitive load theory. *International Journal of Computer-Supported Collaborative Learning*, 13(2), 213–233. <https://doi.org/10.1007/s11412-018-9277-y>

- Klingberg, T. (2009). *The overflowing brain : Information Overload and the limits of working memory*. Oxford: Oxford University Press. Retrieved from <http://cupdx.idm.oclc.org/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=257667&site=ehost-live&scope=site>
- Kosloff, S., Irish, S., Perreault, L., Anderson, G., & Nottbohm, A. (2017). Assessing relationships between conformity and meta-traits in an Asch-like paradigm. *Social Influence, 12*(2–3), 90–100. <https://doi.org/10.1080/15534510.2017.1371639>
- LaRose, R., & Eastin, M. S. (2004). A social cognitive theory of internet uses and gratifications: Toward a new model of media attendance. *Journal of Broadcasting & Electronic Media, 48*(3), 358–377. https://doi.org/10.1207/s15506878jobem4803_2
- Mattek, A. M., Whalen, P. J., Berkowitz, J. L., & Freeman, J. B. (2016). Differential effects of cognitive load on subjective versus motor responses to ambiguously valenced facial expressions. *Emotion, 16*(6), 929–936. <http://dx.doi.org/10.1037/emo0000148>
- Meyrowitz, J. (1985). *No Sense of Place : The Impact of Electronic Media on Social Behavior*. New York: Oxford University Press. Retrieved from <http://cupdx.idm.oclc.org/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=nlebk&AN=330576&site=ehost-live&scope=site>
- Milgram, S. (1974). *Obedience to Authority: An Experimental View*, New York.
- Mori, K., & Arai, M. (2010). No need to fake it: Reproduction of the Asch experiment without confederates. *International Journal of Psychology, 45*(5), 390–397. <https://doi.org/10.1080/00207591003774485>

Morishima, Y. (2013). Allocation of limited cognitive resources during text comprehension in a second language. *Discourse Processes*, 50(8), 577-597.

<https://doi.org/10.1080/0163853X.2013.846964>

Newton, J., Cox, N., Baum, C., Beck, N., Bellocco, R., Kreuter, F.,...Skaggs, D. (2013). The STATA Journal, 13(4), 796-809. Retrieved from <https://www.statajournal.com/sjpdf.html?articlenum=st0318>

Norman, G. (2010). Likert scales, levels of measurement and the “laws” of statistics. *Advances in Health Sciences Education*, 15(5), 625-632. <https://doi.org/10.1007/s10459-010-9222>

y

Pontari, B. A., & Schlenker, B. R. (2000). The influence of cognitive load on self-presentation: can cognitive busyness help as well as harm social performance? *Journal of Personality and Social Psychology*, 78(6), 1092–1108. doi: 10.1037//0022-3514.78.6.1092

Postmes, T., & Lea, M. (2000). Social processes and group decision making: anonymity in group decision support systems. *Ergonomics*, 43(8), 1252–1274.

<https://doi.org/10.1080/00140130050084978>

Richardson, J. (1996). *Evolving concepts of the working memory*. Oxford, NY: Oxford University Press.

Robson, G. (2017). The threat of comprehensive overstimulation in modern societies. *Ethics and Information Technology*, 19(1), 69-80.

<http://dx.doi.org.cupdx.idm.oclc.org/10.1007/s10676-016-9414-0>

- Roda, C. (2011). *Human attention in digital environment*. Cambridge, UK: Cambridge University Press.
- Shepherd, J. L., Lane, D. J., Tapscott, R. L., & Gentile, D. A. (2011). Susceptible to social influence: Risky “driving” in response to peer pressure. *Journal of Applied Social Psychology, 41*(4), 773–797. <https://doi.org/10.1111/j.1559-1816.2011.00735.x>
- Shrive, F., Stuart, H., Quan., H. & Ghali, W. (2006). BMC Medical Research Methodology, 6(57). Retrieved from <http://www.biomedcentral.com/1471-2288/6/57>
- Smith, A., & Anderson, M. (2018, March 1). Social Media Use 2018: Demographics and Statistics | Pew Research Center. Retrieved from <http://www.pewinternet.org/2018/03/01/social-media-use-in-2018/>
- Stein, R. (2011). *A two stage model of influence*. Retrieved from ProQuest Dissertations and Theses.
- Sweller, J. (1988). Cognitive load during problem solving: Effects on learning. *Cognitive Science, 12*(2), 257–285. https://doi.org/10.1207/s15516709cog1202_4
- Sweller, J. (2010). Element interactivity and intrinsic, extraneous, and germane cognitive load. *Part of a Special Issue: Cognitive Load Theory: New Conceptualizations, Specifications, and Integrated Research Perspectives; Review Article, 22*(2), 123–138. <https://doi.org/10.1007/s10648-010-9128-5>
- Tyson, H. L., & Kaplowitz, S. A. (1977). Attitudinal conformity and anonymity. *The Public Opinion Quarterly, 41*(2), 226–234. Retrieved from <https://www.jstor.org/stable/2748339>
- van Maanen, P. & van der Vecht, B. (2014). Development and evaluation of multi-agent models of online social influence based on Cialdini’s principles. *Social Network Analysis and Mining, 4*(1), 218. <https://doi.org/10.1007/s13278-014-0218-0>

- Walker, M. B., & Andrade, M. G. (1996). Conformity in the Asch task as a function of age. *The Journal of Social Psychology; Philadelphia*, 136(3), 367. Retrieved from <https://search.proquest.com/docview/199846209/abstract/8869253DE5504EE3PQ/1>
- Wang, X., Yu, C., & Wei, Y. (2012). Social media peer communication and impacts on purchase intentions: A consumer socialization framework. *Journal of Interactive Marketing*, 26(4), 198–208. <https://doi.org/10.1016/j.intmar.2011.11.004>
- Whiting, A., & Williams, D. (2013). Why people use social media: a uses and gratifications approach. *Qualitative Market Research; Bradford*, 16(4), 362–369. <http://dx.doi.org/10.1108/QMR-06-2013-0041>
- Williamson, P., Weber, N., & Robertson, M. (2013). The effect of expertise on memory conformity: A test of informational influence. *Behavioral Sciences and the Law*, 31(5), 607-623. <https://doi.org/10.1002/bsl.2094>
- Wu, J. & Cheng, T. (2019). Who is better adapted in learning online within the personal learning environment? Relating gender differences in cognitive attention networks to digital distraction. *Computers & Education*, 128, 312-329. [10.1016/j.compedu.2018.08.016](https://doi.org/10.1016/j.compedu.2018.08.016)
- Zhang, L. & Lin, W. (2013). *Selective visual attention: Computational models and application*. New York, Singapore: John Wiley & Sons, Inc.
- Zhu, H., & Huberman, B. A. (2014). To switch or not to switch: Understanding social influence in online choices. *American Behavioral Scientist*, 58(10), 1329–1344. <https://doi.org/10.1177/0002764214527089>

Appendix A

Experimental Survey

*Text with asterisk will not appear on the actual experimental survey, these are notes for the purpose of understanding the survey

*Actual survey will be designed using Qualtrics, this is a prototype

Thank you for your willingness to participate in this study, your time and effort are greatly appreciated.

Please answer the following question.

Are you over the age of 18?

- YES
- NO

*If the participant selects YES, they will be taken to the experimental survey on page 3 of this document

*If the participant selects NO, they will be taken to the thank you message on page 2 and will not be able to complete the experimental survey

Thank you for your willingness to be a part of this study!

Unfortunately, you are required to be over the age of 18 in order to participate.

Thank you for your time!

*At this time, participants will be randomly assigned to either the control or the experimental group by Qualtrics

*Participants will get the same message and directions EXCEPT the number of digits given will differ

*Participants will click to continue to the next page throughout the survey

Thank you for your willingness to be a part of this study!

At any point in time, you as the participant have the right to withdraw, meaning you are not required to finish the survey if you do not wish to. If you wish to do so, please exit the survey page. Your data will be deleted and you will remain anonymous.

This experiment is concerned with what makes a joke funny or not funny. This will be tested using multiple cartoon examples.

Before reviewing the cartoons, you will be asked to respond to two questionnaires. These short questionnaires are modified versions of those used by Kosloff et al. (2017) and Burger (1987).

The following cartoons were provided for use in this study by Dr. Spee Kosloff.

GOAL

This research is concerned with what makes a cartoon humorous by collecting responses to the following cartoons. The goal is to get your honest opinion when shown the cartoons.

Please fill out the following survey. This is a combination of a humor styles survey and a demographic survey. The humor survey will be used in the evaluation of the study. The demographics survey is to learn more about the participant base.

The following questionnaires were provided for use in this study by Dr. Spee Kosloff.

*CONTROL GROUP

DIRECTIONS

1. Ten newspaper style cartoons will be presented to you.
2. You will be asked to rate the humorousness of the cartoon, from 1 to 100, with 100 being the funniest.
3. Please only use digits 1 to 100 to rate the cartoon.
4. This is a REAL TIME survey, so your answers as well as others currently taking the survey will be displayed at the top right-hand corner as a design default.
5. You will be given a set of two digits to memorize and recall at the end of the survey. This is primarily to help your concentration and to ensure the validity of your responses.

Please take your time to evaluate these cartoons and DO NOT rush through.

*EXPERIMENTAL GROUP

DIRECTIONS

1. Ten newspaper style cartoons will be presented to you.
2. You will be asked to rate the humorousness of the cartoon, from 1 to 100, with 100 being the funniest.
3. Please only use digits 1 to 100 to rate the cartoon.
4. This is a REAL TIME survey, so your answers as well as others currently taking the survey will be displayed at the top right-hand corner as a design default.
5. You will be given a set of six digits to memorize and recall at the end of the survey. This is primarily to help your concentration and to ensure the validity of your responses.

Please take your time to evaluate these cartoons and DO NOT rush through.

*CONTROL GROUP ENTRY PAGE

The experimental survey will begin on the next page. Please take as much time as needed to remember the following digits.

Digits to recall: 5 8

Reminder: This is a REAL TIME survey, answers of other participants will be shown in the right-hand side of the screen as a design default

*EXPERIMENTAL GROUP ENTRY PAGE

The experimental survey will begin on the next page. Please take as much time as needed to remember the following digits.

Digits to recall: 2 3 8 4 6 9

Reminder: This is a REAL TIME survey, answers of other participants will be shown in the right-hand side of the screen as a design default

*The following pages will be the same for both the control and experimental groups

INCOMING RATING RESULTS

Please take your time and evaluate this cartoon for humorousness on a scale of 1 to 100, with 100 being the funniest. When you are ready to give your rating, please click next.



"We disliked each other on sight until push came to nudge."

INCOMING RATING RESULTS

75

88

90

83

95

Please provide your rating of the above cartoon by sliding the bar to your preferred rating.

*Slide bar of a scale of 1 -100 was provided here for participants to give their rating of the previously viewed cartoon

*Numbers seen above were appearing one by one to appear as other participant's ratings

*These two pages were repeated with the next 9 cartoons

Please recall and type the digits you were given here:

*Before debrief, participants were asked to recall their digits given on the page after the last cartoon ratings

If you wish to SUBMIT your responses at this time, please click the submit button. Your responses will then be seen and collected for this study.

*SUBMIT BUTTON WILL BE PLACED HERE ON THE SURVEY, QUALTRICS SOLUTION WILL BE USED TO DELETE RESPONSES THAT ARE NOT COMPLETE

If you DO NOT WISH TO SUBMIT, please feel free to click out of this page. Your responses will be noted as incomplete, and will be deleted.

If you have any questions or concerns about this or other portions of the study, please contact the researcher.

Your time and efforts are appreciated, thank you!

CONTACT INFORMATION

*CONTACT INFORMATION FOR BOTH THE RESEARCHER AND THE FACULTY ADVISOR WILL BE GIVEN HERE

Appendix B

CONSENT FOR ANONYMOUS SURVEY (click consent)

The purpose of this study is to examine the relationship between cognitive load and conformity. We expect approximately 80 volunteers. No one will be paid to be in the study. We will begin enrollment on 11/01/2018 and end enrollment on 2/01/2018. To be in the study, you complete this online survey, with coinciding demographic subsections. This will ask you questions about your demographics, what you believe makes a joke funny or not as well as questions about your personal opinions of stimuli. Completing the survey should take less than 15 minutes of your time. The online survey is anonymous. We will only ask about your demographic information for the sole purpose of creating an understanding of outside factors that could influence the study. We will have no record of who completes this survey and your information will be protected. If you wish to remove your answers at any point during the survey, you will have the option to click out of the page. Any incomplete surveys will be deleted and data will remain anonymous.

There are no risks to participating in this study other than the everyday risk of being on your computer as you take this survey. The benefit is your answers will help us understand the relationship between overstimulation and conformity. You could benefit by being a part of an interesting study and having the chance to reflect on the effect of overstimulation on society.

All data is collected anonymously. If you were to write something that made it to where we predict that someone could possibly deduce your identity, we would not include this information in any publication or report. Any data you provide would be held privately. All data will be destroyed three years after the study ends.

You can stop answering the questions in this online survey if you want to stop. You have the right to withdraw your answers at any point without penalty.

Please print a copy of this for your records. If you have questions you can talk to or write the principal investigator, Kaylee Baker at kabaker1998@gmail.com. If you want to talk with a participant advocate other than the investigator, you can write or call the director of our institutional review board, Dr. OraLee Branch (email obranch@cu-portland.edu or call 503-493-6390).

Click the button below to consent to take this survey.

Appendix C

Humor Styles Questionnaire

Using the 5-point scale below, please indicate on the corresponding line how often you agree with each statement. Please write clearly.

1 = Never or rarely true

2 = Rarely true

3 = Sometimes true

4 = Often true

5 = Very often or always true

- _____ 1. I usually don't laugh or joke around much with other people.
- _____ 2. If I am feeling depressed, I can usually cheer myself up with humor.
- _____ 3. If someone makes a mistake, I will often tease them about it.
- _____ 4. I don't have to work very hard at making other people laugh – I seem to be a naturally humorous person.
- _____ 5. Even when I'm by myself, I'm often amused by the absurdities of life.
- _____ 6. People are never offended or hurt by my sense of humor.
- _____ 7. I rarely make other people laugh by telling funny stories about myself.
- _____ 8. If I am feeling upset or unhappy I usually try to think of something funny about the situation to make myself feel better.
- _____ 9. When telling jokes or saying funny things, I am usually not very concerned about how other people are taking it.

- _____ 10. I often try to make people like or accept me more by saying something funny about my own weaknesses, blunders, or faults.
- _____ 11. I laugh and joke a lot with my closest friends.
- _____ 12. My humorous outlook on life keeps me from getting overly upset or depressed about things.
- _____ 13. I do not like it when people use humor as a way of criticizing or putting someone down.
- _____ 14. I don't often say funny things to put myself down.
- _____ 15. I usually don't like to tell jokes or amuse people.
- _____ 16. If I'm by myself and I'm feeling unhappy, I make an effort to think of something funny to cheer myself up.
- _____ 17. Sometimes I think of something that is so funny that I can't stop myself from saying it, even if it is not appropriate for the situation.
- _____ 18. I enjoy making people laugh.
- _____ 19. If I am feeling sad or upset, I usually lose my sense of humor.
- _____ 20. I never participate in laughing at others even if all my friends are doing it.
- _____ 21. When I am with friends or family, I often seem to be the one that other people make fun of or joke about.
- _____ 22. I don't often joke around with my friends.
- _____ 23. It is my experience that thinking about some amusing aspect of a situation is often a very effective way of coping with problems.
- _____ 24. If I don't like someone, I often use humor or teasing to put them down.
- _____ 25. I usually can't think of witty things to say when I'm with other people.

- _____ 26. I don't need to be with other people to feel amused – I can usually find things to laugh about even when I'm by myself.
- _____ 27. Even if something is really funny to me, I will not laugh or joke about it if someone will be offended.
- _____ 28. Letting others laugh at me is my way of keeping my friends and family in good spirits.

Demographic Questions

What is your age?

What is your race?

What is your ethnicity?

What is your sex?

With what gender do you identify?

What is your religion?

What is your highest level of education obtained?

The results from this test will be stored and used for research (completely anonymously). Please estimate how accurate your answers were about yourself on a scale of 0-100, where 100 means completely accurate (you had no doubts about any of your answers) and 0 means you answered the items randomly. If you do not want your answers used for research, write 0.

Appendix D

Study Debrief

Thank you for willing to participate in this study, your time and effort were greatly appreciated!

IMPORTANT NOTE: STUDY DEBRIEF

At the beginning of this study, you were informed that I was researching what made a cartoon humorous or not. This is NOT the true purpose of my study.

- I am actually looking at how individuals respond to group pressure when faced with opinion-based stimuli (the cartoons) and cognitive load (the digits you were asked to recall).
- The group answers provided were actually predetermined numbers picked out to frame the unfunny cartoon as funny and were not real answers for other participants.
- The digits given were a form of cognitive load, not a concentration tactic
- There were two groups: if you received two digits, you were in the control group and if you received six digits, you were in the experimental groups
- The only difference in the two groups was the number of digits, so I am able to examine if a higher cognitive load as well as group pressure had any effect on your responses
- This was a necessary form of deceit in order to examine the true reason behind the study. Deceit in this case was deemed as a minimal risk component to this study.
- PLEASE NOTE: The only data collected and recorded will be answers from the hilarity ratings and from the provided demographic information.
- PLEASE NOTE: Only data from the demographic questionnaire and hilarity ratings will be used in analysis. Data from the humor questionnaire and the memorization of digits WILL NOT be used or observed in analysis.