Enclothed Emotion: A Study of Attire and Attention

A project completed in partial fulfillment of the requirements for the Honors Program

by

Alexis Haynes

December 11th, 2017

Psychology
Ohio Dominican University

Approved by

Vil S. Matt, Adviser

Reader

Accepted by

Vil S. Matt, Ph.D., Director, ODU Honors Program
Abstract

Outside stimuli are known to affect cognitive processes (e.g., noise from a TV can affect how well a person attends to reading). The theory of embodied cognition extends this research to clothing. For example, participants who were primed to think their lab coat belonged to a doctor, were more attentive to detail on a change detection task than those who thought their coat belonged to a painter (Adam & Galinsky, 2012). Similarly, helping behavior was affected by a person wearing scrubs they believed belonged to a nurse rather than a cleaner (Lopez-Perez, Ambrona, Wilson, & Khalil, 2016). The current study combined key ideas from previous studies of clothing and emotion. Participants wore formal clothing into the lab and were randomly assigned to a positive prime (dressed for a wedding) or negative prime (dressed for a funeral). Participants completed the Positive and Negative Affect Scales to measure any emotional effect of the prime. Finally, participants completed a Stroop task to measure the effect of the prime on attention. Results showed greater positive than negative affect regardless of condition. Stroop results did not support the predicted effect of greater disruption on primed trials (e.g., longer reaction times when the Stroop word matched the prime), but were consistent with research on semantic priming and terror management theory.
Enclothed Emotion: A Study of Attire and Attention

The phrase, “dress for success”, is one that many people may have heard and live by, but what is the truth behind this phrase? The association between type of clothing and meaning was created through the process of socialization. Over time clothing was chosen and worn for different professions and purposes, which brought about different ideals of the meaning and appropriateness of the clothing. These ideals then prime information from stored core knowledge for people to react appropriately in different social situations (Molden, 2014). This topic was of recent discussion in the White House as Speaker Paul Ryan was working to “modernize” the dress code for the Speaker’s Lobby (Robbins, 2017). The dress code currently bars women from wearing open toed dress shoes and sleeveless tops. After the review of Adam Galinsky’s *Embodied Cognition*, the house has kept its strict dress code because it encourages taking professionalism seriously and staying cognitively sharp through long work days (Robbins, 2017).

**Grounded Cognition**

The theory of grounded cognition was around before the most widely accepted theories of cognition were developed (Barsalou, 2010). The theory of grounded cognition separates cognition into two systems, modal and amodal. The brain’s modal system completes the functions of action, perception, and introspection while the amodal system holds core knowledge and representations (Barsalou, 2010). In this theory the modal system, which is sensitive to sensory and perceptual detail associated with concepts and memories, allows the use of the environment, body, situation, and stimulations in order to ground the core knowledge. This allows the brain to be well equipped to face external stimuli because cognition is grounded in the body’s interactions with the environment (Pecher & Zwaan, 2005).
Core knowledge is held in the semantic memory system (amodal system) and perception is held in the brain’s modal system (Barsalou, 2008). The semantic memory system holds long-term memories that serve the purpose of common knowledge rather than personal experiences or memories and emotions, like the modal system. These two systems communicate with one another by translating the information in the modal system into symbols representative of experiences that then become long term knowledge in the amodal system (Barsalou, 2008). This allows the brain’s modal and amodal systems to communicate, finding common ground or shared information in order to function.

Over the years, philosophers, linguistics, neuroscientists, and cognitive psychologists explored this idea of cognition being grounded in the core knowledge of the amodal system (Barsalou, 2010). Through individual explorations in different disciplines, the theory evolved. The theory of grounded cognition has received empirical support. Cognitive neuroscientists have performed research to show that when tasks of memory, knowledge, language and thinking are completed, the brain’s modal system does become active (Barsalou, 2010).

Participants were asked to complete cognitive tasks using memory, language, and knowledge during neuroimaging (Peecher & Zwaan, 2005). The neuroimaging showed the brain’s modal and amodal systems were both active and suggests an order to which the systems work together. The brain’s amodal system is first triggered by the words and goals of the task and quickly translates its long-term core knowledge into symbols for the modal system to use (Peecher & Zwaan, 2005). The amodal system then uses the stored concepts, perceptions and emotion, to complete the cognitive process.
Many of the complex cognitive processes that humans carry out such as, conceptual memory or perception, give evidence that there must be an area in the brain that grounds cognitive processing or in simpler terms, provides the common ground. The study in neuroscience, as well as many others, brought about more awareness of grounded cognition and more acceptance of the theory (Barsalou, 2010). This grounded core knowledge is stored in the amodal system of the brain and the modal system quickly taps into this system to react and function with everyday stimuli. The connection between these two systems, allowing humans to face every-day stimuli has brought about questioning of how the external world plays a role in cognition.

**Embodied Cognition**

The theory of embodied cognition highlights that cognition is situated (Spackman & Yanchar, 2014). In this theory environment is viewed as a working part of cognition. Now, normal cognitive processes such as thinking, memory, and attention are interconnected with the physical and temporal position of the body (Spackman & Yanchar, 2014). No longer is cognition viewed as a process that occurs in an isolated space working independently of the body. Rather, the brain function of perception and the bodily function of action have an effect on one another (Spackman & Yanchar, 2014).

Embodied cognition adds to the standard cognitive theories, like grounded cognition, the idea that functional actions build onto perception (Spackman & Yanchar, 2014). Perception is paired with the body in embodied cognition, and the two affect one another. For example, if a person showed up to a dinner party in sweat pants, he or she might feel uncomfortable because of the inappropriate clothing. This could cause a disruption in their cognitive process of attention. Therefore, when the person returns home, he or she cannot remember what was had for dinner.
because of the interfering thoughts of being dressed inappropriately. This has allowed the domain of what can now be considered cognition to be expanded to clothing.

**Enclothed Cognition**

It is known that clothing affects perception, but how perception of clothing affects cognitive processes is a relatively new avenue of research (Adam & Galinsky, 2012). Using the theory of embodied cognition, clothing can be thought of as a physical extension of the body. Therefore, different types of clothing could affect how well cognitive processes, such as attention, learning, and thinking, function. This idea, specifically being tied to clothing, has been called enclothed cognition, but expands directly from embodied cognition (Adam & Galinsky, 2012).

For clothing to have a direct effect on any cognitive processes, the clothing must be worn (Adam & Galinsky, 2012). The symbolic meaning of different types of clothing is formed socially; therefore social priming is at work during enclothed cognition. Social priming is the process of social constructs affecting behavior unconsciously. The priming theory of active-self states that priming cues can cause a change in the current self (Schroder & Thagar, 2013). The current self is defined as an integrated mix of relevant knowledge and social interaction, by which priming cues would allow access to only a subset of information relevant to the social situation (Schroder & Thagar, 2013). Thus, showing how the social primed representations of the social target (clothing) can affect our own mental representations of the target clothing (Strack & Schwarz, 2016).

Enclothed cognition has been demonstrated by research. For example, participants were asked to wear a white lab coat and the researcher either told the person the coat belonged to a doctor or a painter (Adam & Galinsky, 2012). While wearing the lab coat, four comparative
visual search tasks were administered. In these tasks the participants were told to find the differences between pairs of pictures and write them down as quickly as they could. The researchers counted how many differences each participant found (Adam & Galinsky, 2012). According to the theory of enclothed cognition, the participants should embody the characteristics primed by the stated occupation for the lab coat, either doctor or painter. The hypothesis was that participants in the doctor’s-coat condition would find more differences in the visual task than those in the painter’s-coat condition because doctors are socially constructed to be smarter than painters (Adam & Galinsky, 2012). A significant finding in difference detection was found between the conditions. Those wearing a doctor’s coat found more differences than those wearing a painter’s coat (Adam & Galinsky, 2012).

Not only do primed social constructs affect cognitive processes through the embodiment process, but primed emotions could also have an effect. Subtle priming techniques have been shown to have an effect on other’s empathetic behaviors (Lopez-Perez, Ambrona, Wilson, & Khalil, 2016). Using the enclothed cognition model, research was done using professions that should prime a difference in helping behavior. In a study, all participants wore scrubs; half of the participants thought the scrubs belonged to a nurse and the other half thought they belonged to a cleaner (Lopez-Perez et al., 2016). While wearing the scrubs the participants were asked to write an essay on how they identify with the scrubs and then were asked to read a story from a magazine about a child (matched to the participants’ gender). The character had lost his or her parents in a car accident and was struggling to graduate and get a job in order to keep custody of his or her siblings. After reading the story the participants completed the Empathetic Response Scale and then were given the opportunity to volunteer to spend time with the child (Lopez-Perez et al., 2016).
The participants were then given an emotional Stroop task to see if they had an altruistic motivation to help the child or an egotistical motivation (Batson et al., 1988). Results showed that those wearing a “nurse’s scrubs” scored higher on the Empathetic Response Scale than those wearing a “cleaner’s scrubs”. Participants wearing nurse’s scrubs helped the child 64% of the time, which was higher than those wearing a cleaner’ scrubs who helped 32% of the time. Similarly, the emotional Stroop task showed that those in the nurse’s scrubs condition showed higher latency in their response to altruistic words than those in the cleaner’s scrubs condition (Lopez-Perez et al., 2016).

**Social Priming & Clothing**

The current study will focus on how formal clothing, worn for a variety of occasions, affects cognition. A constant in most situations that people wear formal clothing is a perception of professionalism that can lead to an interpretation of high social distance. Clothing serves many purposes in life, but one of the largest is self-perception (Slepian, Ferber, Gold, & Rutchick 2015). Through clothing people are able to alter their self-perception without any changes to their own personal self. Thus, wearing formal clothing has the potential to cause many different cognitive changes.

A study was completed to examine more closely a few of the potential cognitive changes caused by formal clothing (Slepian, Ferber, Gold, & Rutchick 2015). In demonstration, specifically, how formal clothing affects abstract and concrete cognitive processing. Abstract cognitive processes are holistic broad mental representations that allow people to see the “bigger picture”. Concrete processing is a subordinate narrow mental representation that would cause a person to want a smaller gain now, rather than a larger gain later. These two types of processing play a large role in a person’s ability to save money, and complete delayed gratification and
long-term goals (Slepian, Ferber, Gold, & Rutchick 2015). Constructural level theory states that the use of either abstract or concrete processing is affected by social distance because large social distance seems more abstract, while shorter social distance is perceived as concrete.

Researchers asked college students to rate how formal their own clothing was in comparison to the other college students passing by. The student could pick on a scale of -50 (very much less formal) or +50 (very much more formal) and then completed the Behavioral Identification Form. The Behavioral Identification Form used questions such as, “choose the preferred description of “voting”, “influencing others” or “marking a ballot”” (Slepian, Ferber, Gold, & Rutchick 2015, p. 662), to determine if the person’s activity in life is at a relatively high or low level. Participants who score high on Behavioral Identification will be seen as more abstract thinkers and those who score low as more concrete thinkers (Slepian, Ferber, Gold, & Rutchick 2015).

The results showed that those who identified themselves as dressed more formally than their peers had high action identification levels on the Behavioral Identification Form. Thus, showing that those who view themselves at a high social distance from others seem to overall have a better holistic view and are more likely to reach long-term goals. This research brings to light two important points in the field of cognition and clothing. One, that formal clothing does make a positive impact on cognitive processing and success, and two, that social cues have played a role in that development (Slepian, Ferber, Gold, & Rutchick 2015).

Social distance is thought to be built through formal clothing because of the atypical, not intimate setting, it creates and this has been put to the test in research (Slepian, Ferber, Gold, & Rutchick 2015). Undergraduates were asked to judge the formality of their own clothing compared to their peers as in the previous research, but then they were asked further questions.
The further question asked of social commonality, closeness, and intimacy, which all have an effect on social distance. If a person feels high in those three categories, social distance will be low, but if they feel low in the three categories, social distance will be high. All participants were then asked to complete the Behavioral Identification Form again to measure action identification. The results showed that when participants viewed themselves as more formal and socially distant from their peers their action identification was higher. This highlights the use of abstract thinking rather than concrete (Slepian, Ferber, Gold, & Rutchick 2015).

Simply by observing the clothing of others around them the participants were comfortable to make judgments of formal and social similarity, which should speak volumes for the emphasis society has put onto clothing. Clothing has become a way to express one’s true self or to impress, to show power or to show comfort (Slepian, Ferber, Gold, & Rutchick 2015). The different social uses of clothing create perceptions and emotions that become stored in the brain’s amodal system. After repetition those perceptions and emotions from the clothing and social situation become grounded in the brains modal system as core knowledge. The brain’s modal system of core knowledge then serves as the grounding for every cognitive process to be carried out through the brain. This is the connection of social priming or cues to cognition.

Social priming occurs through repeated social cues triggering automatic social behavior. For example, when a person sees someone in formal clothing, the social cue of formal clothing automatically triggers a behavior appropriate with a large social distance, like politeness. This works the same way for casual clothing (Hannover & Kühnen 2002). A person who wears causal clothing to events may be viewed as more relaxed because relaxation is a social behavior that has been primed in association with causal clothing. In general, people make perceptions based simply on physical aspects, which can be provided in descriptions (Hannover & Kühnen 2002).
Simply by providing pictures of different instructors dressed either casually or professionally, students gave different rankings on approachability and knowledge without even meeting them in person (Hannover & Kühnen 2002). This shows once again that the subtle social cues make a large impact on perception and emotion, which in turn will affect cognition. A student who views the teacher as knowledgeable may pay better attention, using the cognitive ability of inhibition better than if the teacher was more approachable. Most research in the field of clothing asks the participants to judge others around them, but does not ask them to judge themselves alone (Hannover & Kühnen 2002). Different types of clothing prime different social behaviors, which is believed to hold true for the self as well, not only when judging others. Therefore, priming can even have an effect on self-description.

People should respond faster to descriptions that match their current type of dress and should overall describe themselves in a consistent manner to their clothing (Hannover & Kühnen 2002). Participants were asked to come into the lab to participate in a police lineup in which they were assigned to be a suspect or fake suspect. When being told their individual cover stories, the participants were told to dress like their suspects, which was either formal or casual. When the actual experiment began, all participants were told to draw a lottery ticket, which read their status, guilty or not guilty. All read “not guilty.” After being given all of the information about themselves (as a suspect), the participants answered either me or not me, to trait adjectives using a keyboard. Some of the adjectives for formal clothing were strategic, neat, and tolerant, and for casual wear words like easygoing and nonchalant were used (Hannover & Kühnen 2002).

The results showed that participants in formal clothing answered, ‘me,’ for the traits primed to be associated with people whom wear formal clothing and the same occurred for those whom wore causal clothing (Hannover & Kühnen 2002). This shows that primed social
behaviors associated with clothing do affect the self-description adjectives that people associate themselves with, even when being a fake suspect. This research also highlights that the cognitive responses most easily accessible to a person are the ones associated with their current clothing, regardless of how the person tends to be in everyday life (Hannover & Kühnen 2002). For example, the words neat and tolerant were given as adjectives. It was found more often that a person in formal clothing said ‘me’ for strategic than the person in casual clothing because neat is a primed typical behavior of people who wear formal clothing. This was regardless of how they tend to be as themselves in real life and simply based on who they are acting to be in the current clothing and setting. It is found to be easier to embrace the traits associated with the clothing a person is wearing than to be him or her self (Hannover & Kühnen 2002).

**Conclusion**

Overall, these studies demonstrate that clothing can prime social constructs affecting cognitive and emotional processes. It hints that what may be affecting cognitive processes are the underlying positive or negative emotions conceptually tied to each type of clothing. That is, an emotional response might mediate the priming effect. The goal of the current study is to explore the role emotion plays. Rather than controlling the particular garments worn, the participants will be asked to dress formally. When they arrive, they will be primed to think of their clothing in either a positive (happy) or negative (sad) context. Positive and negative affect will be assessed as a mediator for any observed effect on selective attention.

**Method**

**Participants**

The participants were students at Ohio Dominican University. Most of these students came from the Introduction to Psychology classes. The ages ranged from 18-23 with one adult
over the age of 50. Both male and female students are included. The number of participants was 30 with one participant’s data being removed as a result of wearing casual clothing.

**Materials**

The materials used for this study were the PANAS (Watson, Clark, & Tellegen, 1998) and the Stroop task. The PANAS was used to measure the effect of priming through how the participants felt in the present moment. The Stroop task was administered on a computer running DirectRT, a program designed to collect reaction time and accuracy data. Each task is described below.

**PANAS**

The PANAS is made up of two 10-item scales that give a brief measure of positive affect (PA) and negative affect (NA) (Crawford et al., 2009). Positive and negative affects are broad mood dimensions that are independent of one another. High PA is the dimension that captures the extent to which an individual experiences pleasure and low PA is the absence of a pleasurable experience. High NA is the dimension that captures the extent of distress or unpleasurable experiences and low NA represents the absence of unpleasurable experiences (Crawford et al., 2009).

**Stroop**

The Stroop task measures selective attention (Stroop, 1935). The original Stroop task was a task of identifying the color the word appears in while inhibiting the color the word reads. For example, congruent trials of the word r-e-d would appear in the color red and incongruent trials of the word b-l-u-e would appear in the color red. In both cases the participant should respond with red. The emotional Stroop task was used in this study, which means any words can be used rather than the typical Stroop with only incongruent and congruent color word trials (Batson, et
This task was computerized and had three different categories of words. The categories are words associated with a wedding (aisle, bride, vows, and chapel), words associated with a funeral (casket, loss, tears, and death), and neutral words (door, chair, brush, and pencil). All categories contain four words, one 4-letter word, two 5-letter words, and one 6-letter word (Batson, et al., 1988). Each of the words in each category appeared in the colors of green, red, blue, and yellow. The participant identifies the color each word appears in by pressing the appropriate key on the keyboard as fast as they can. Practice trials of rectangles presented in the four different colors were given to allow the participant to become familiar with the keys.

**Procedure**

The current study explored the priming of emotional response to professional clothing and how it affects cognitive processing. Individually participants were asked to come into the lab dressed formally; for example, black pants and a blouse or dress shirt and tie would be suitable. Once the participant arrived, the researcher, through random assignment, primed him or her by saying, “Oh perfect clothing, you look just like you are going to a wedding/funeral”. The participants then took a seat, and completed The Positive and Negative Affect Scale (PANAS), followed by the emotional Stroop test.

Those primed for a wedding were hypothesized to have high PA and low NA and participants primed to feel they are dressed for a funeral were hypothesized to have high NA and low PA. Both groups were expected to perform the slowest on the words in the Stroop task that are associated with their appropriate primed emotion because priming causes participants to pay more attention when the words are connected to their primed conceptual context. Therefore, it
should be relatively harder for them to be selective with their attention and ignore their processing of the related word to rapidly identify its color.

After each participant finished the study there was a debriefing. The statement was as follows. “You were randomly assigned to be told you looked dressed for a wedding/funeral to see how it affected your Positive Affect Negative Affect Scale and Stroop task scores. The PANAS measured how the priming of telling you that you looked dressed for a wedding/funeral affected your mood and the Stroop task served as the measure of cognitive ability. You actually dressed formally as asked of you.” Most participants were relieved to be told that the researcher did not actually think their clothing represented their primed event. Some participants would even express that they did not feel their clothing truly matched their primed event, which sparked some great conversation.

**Results**

All participants were asked to wear formal clothing with the example of dress pants and a blouse or dress shirt and tie given, but it was not limited to only that outfit. Most participants followed closely to the example clothing given and most participants who strayed from the example would ask if their clothing was acceptable to which my response was always “yes.” Some women wore dresses and skirts, as expected. Almost all male participants wore casual shoes, like tennis shoes or Vans, with their formal clothing, while most women wore boots or flats, which is considered to be formal. The participants mostly responded to the priming with a small smile or giggle, but a few made comments such as, “oh”, “I do?”, or “ok”. No matter what the response was given after the priming statement, everyone received a neutral response in return.
The hypothesis for PANAS scores was that the wedding group should score higher in positive affect than negative affect and the funeral group should score higher in negative affect than positive affect. There was no significant difference in PANAS scores between groups, \( t(27) = 1.092, \ p < .05 \). After completing a mixed ANOVA on PA and NA PANAS scores, a main effect of affect was found. Regardless of condition, participants scored significantly higher on positive affect than negative affect, \( F(1,27) = 75.50, \ p < .01 \) (see Figure 1).

It was hypothesized that participants should have a longer reaction time when responding to words congruent with their primed event in the Stroop task. Participants in the funeral group had an average reaction time of 644.17 (msec) when responding to funeral words and an average reaction time of 716.78 (msec) when responding to wedding words. When responding to wedding words the wedding group had an average reaction time of 659.39 (msec) and when responding to funeral words the wedding group had an average reaction time of 638.56 (msec). An ANOVA revealed a significant main effect of Stroop word category, \( F(1,27) = 5.00, \ p = .03 \) (see Figure 2). Regardless of condition, participants took longer to indicate the color of funeral-related words (M = 682) than wedding-related words (M = 649). The priming group of Stroop word interaction was not significant, \( F(1,27) = 3.38, \ p = .08 \), but this is likely due to low power in the analysis given the sample size.

Another dependent variable related to Stroop was analyzed to assess the amount of variation across trials for each subject. The prediction is that if the wedding prime or the funeral prime disrupts performance on Stroop wedding words (for the wedding primed group) and funeral words (for the funeral primed group) then there would be more variation within those trials for each participant than within the trials unrelated to the prime. A mixed ANOVA on standard deviation was run but no significant effects (see Figure 3).
Discussion

The results of this current research provide evidence that the emotion embedded in the social constructs of clothing plays a role in cognition. What each person socially thinks and feels about his or her clothing can have an effect on their cognitive abilities throughout the day. The social feelings and thoughts especially have an effect if a person has a positive feeling or emotion behind the clothing he or she is wearing. This research shows there may be more variability in focus or attention in that case. When the analysis of variance was run on reaction time for the Stroop for both the wedding and funeral groups, it revealed that overall, the wedding group showed more variability in scores than the funeral group. This is so, even though most people may not feel their best or view their day as the best when they are negative or iffy about their clothing it may actually benefit them. A person may actually pay better attention and have more consistency when feeling not as positive and comfortable about his or her clothing chosen for the day.

Although this result may not align perfectly with the theories of embodied cognition, it aligned with the standard theories of semantic priming as well as research on terror management theory. Standard theories of semantic priming state that when a certain emotion is primed, it then becomes most active in the brain. The brain pulls forward relevant schemas and it becomes most attentive to things that align with the priming. This would then predict a participant in this study to perform faster on the Stroop task to the words in his or her specific primed group. Having no significant difference in reaction times between groups when responding to the words matching his or her primed emotion shows this theory to be active.

Terror management theory may also be at play with the result of participants overall taking longer to respond to funeral words than wedding words. The theory of terror management
focuses on the priming of death (Girschberger et al., 2013). Humans have an innate motivation to survive and they have the cognitive ability to be aware of this. Therefore, whenever anything harms or interferes with this impulse, our brain activates an innate defense mechanism that constrains the awareness below consciousness (Girschberger et al., 2010). Although unintentional in this study, using language around the concept of funeral could be priming the idea of death. This could have caused the participants to hesitate when the funeral words appeared in the Stroop task because of the brain’s innate reaction to maintain any survival threat below conscious awareness.

Further research would be the best route to giving a more confident explanation of the results. Simply, with more participants, this study could show clearer more conclusive results. An expansion on priming could also bring more concise explanations. Following the theory of embodied cognition, adding properties to the room that also convey the event being primed could bring about larger effects of priming, thus allowing conclusions to directly connected to the priming. This would also allow for better control because the study would not directly rely on students following directions and focus more heavily on what is supplied by the research. Overall, this study has brought to light interesting results based on the theory of embodied and enclothed cognition that is ready for extension.

References


Figure 1. PANAS scores for both primed groups.
Figure 2. Reaction time analysis between groups.
Figure 3. Variance analysis between groups and reaction time on the Stoop task.